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Textual Organisation and Construal of Interpersonal Meanings in Different Genres of Medical Texts

YAN GAO

DOCTOR OF PHILOSOPHY



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Aston University

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Yan Gao Doctor of Philosophy 2017

Thesis Summary

This thesis investigates thematic organisation and construal of interpersonal evaluative meanings in the Introduction (Beginning) and Discussion (Concluding) sections of two medical genres: medical research articles (RAs) and medical review articles (reviews). Situated within EAP educational context, the study aims to examine variations between medical professionals and PhD candidates in academic writing, thus assisting candidates for successful academic publication.

Two sets of corpus data are established, which involve published professional medical papers and students draft medical writings. Linguistic analyses concerning thematic structures and evaluative stances are explored, drawing on Systemic Functional Linguistics (SFL) and Appraisal theory.

The major findings reveal that PhD candidates demonstrate capabilities of handling textual organisation and construction of interpersonal meanings in medical RA genre. However, some problems do arise when they compose their review drafts. The pedagogical implications of this research for the motivation of PhD candidates, for discourse-based writing approach and for raising awareness of organising textual and interpersonal aspects of meanings in academic writing instruction are considered. These elements may provide useful insights in informing curriculum design for academic writing and publication.

Key Words: medical discourse; thematic structures; Systemic Functional Linguistics; Appraisal theory; EAP pedagogy

To my parents with love and thanks.

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Chapter One Introducing the Research

Initiated by personal teaching experiences in a university in China, my research will examine textual organisation and interpersonal meanings in two genres of medical texts, which involve medical research articles (RAs) and medical review articles. The data is collected from both published professional medical texts and students' draft medical writings. The analysis will be theorised within Systemic Functional Linguistics (SFL) framework. The major findings, it is hoped, could in a sense, contribute to the reforms of current curriculum design and better adapt to the needs of language learners within ESP context.

1.1 The Role of Academic Scientific Writings

Transmission of academic scientific knowledge could be expressed in popularised language. However, it is demonstrated most significantly and frequently by scientific language within a community of social practice and conventions. Martin and Veel (1998) highlight the prominence of scientific language as follows: 'it performs distinct functions in society, has a distinct set of users and has distinct grammatical and textual structures' (p181). Under many circumstances, written academic discourse is often taken as a way for scientists to circulate research findings within an academic community and establish communication and relations with peers. As Hyland (2004) specifies that: [scientific papers] are 'the channel which allows scientists to relay observable facts' (p88).

In recent years, the essential role of academic discourse, especially that of written academic discourse has been recognised and drawn wider concerns. Hyland generalises two aspects of reasons for the significance of academic writings in

academic life. In the first sense, written academic texts provide 'a rich source of information about social practices of academics' (Hyland, 2004: 2). Furthermore, the major work of academic researchers is to write: 'they publish articles, books and review' (Hyland, 2004: 3). From this perspective, academic writings may be considered as a more desirable way for us to have a better understanding of academic disciplines. More importantly, it is undoubtedly necessary to develop academics' competence for constructing academic discourse and getting recognition from peers within a discourse community. As Martín Martín (2003) highlights:

Scientists belonging to all academic discourse communities are characterised by the wish to communicate new knowledge to the other members of the academic community, and the main way of transmitting scientific research is by means of publication. Therefore, it is essential for these academics to have a good command of the discourse conventions which characterize scientific writing.

(Martin Martin, 2003:25)

Taking a social constructionist view, Kaplan and Grabe regard scientific writings as 'a social act within a social context – the social construction of scientific reality' (1991: 210). Scientific academic writings may be perceived as conforming to 'certain well-documented generalizations said to represent the scientific "style" of writing'. (Kaplan and Grabe, 1991: 200), with the shaping of them deeply reflected in cultural and rhetorical roots (Kaplan and Grabe, 1991). In this view, academic writings may help individuals 'to become members of communities, to cement relations with a community'; and 'to determine and define who they are and what they believe within a discourse community of peers' (Kaplan and Grabe, 1991: 208). To transmit scientific knowledge within the academic community, academics convey both 'propositional meaning and evaluative, interpersonal interaction-oriented meanings' (Mauranen, Pérez-Llantada and Swales, 2010:643).

In light of the above account, it could be summed up that written academic discourse plays a crucial role in disseminating and exchanging academic knowledge in academic life. Situated within social contexts, written academic discourse is embodied not only reflecting its rhetorical organisation but also persuasive features. With the globalisation throughout areas of economy, technology and education around the world, the social contexts in which meanings are construed have been more globalised. Halliday (2003) emphasises this global characteristic of social contexts as that:

Meanings get shaped, not by decree but through ongoing interaction on the semiotic contexts of daily life; and these have now become global contexts, even if those participate in them are still only a fraction of the total population of the globe.

(Halliday, 2003: 417)

It has been a general consensus that academic researchers use language more internationally to achieve their communicative purposes and promote exchanges for research findings. The following sections will discuss the feature of English as an international language for academics.

1.1.1 English as an International Language in Academic World

The development and advancement of science and technology are vital to the civilization of human society. Scientists from different research domains need to promote exchanges with peers and manifest scientific knowledge as well as experiences through academic writings. In an era of globalisation, it is an indisputable fact that English has been accepted as the 'principal medium for the transmission and exchange of academic knowledge' (Mauranen, Pérez-Llantada and Swales, 2010: 634). The central and dominant roles of English as an international language for 'publication of academic research findings' and 'for the communication of scholarship, research and advanced postgraduate training' have been widely acknowledged (Flowerdew, 1999:

124; Mauranen, Pérez-Llantada and Swales, 2010: 634). This factual situation is echoed by Seidlhofer (2009) as that: ‘...for the time being anyway, it is English as a lingua franca that is the main means of wider communication for conducting transactions and interactions outside people’s primary social spaces and speech communities’ (p238). In this vein, the mastery of English in dispersing scientific knowledge and presenting empirical research is quite significant for academics. As Kanoksilapatham (2005) observes: ‘in the context of globalization and increasing international research collaborations, the ability to read and/or write research articles in English is, thus, crucial for academic and professional success in science and technology’ (p270).

1.1.2 English as a Communicative Medium for Non-Native Speakers

Apart from the perception of English as the international language of science, the important aspect of this current situation, on the other hand, resides in the increased number of non-native speakers (NNSs) using English to participate in academic practice of writing (Mauranen, Pérez-Llantada and Swales, 2010). It is noted that the increasing pressure and need of non-native speakers in academic world is ‘to publish in international journals in English, ‘with the globalisation and marketisation of the academy’ (Flowerdew, 2008: 77). Due to their status of being NNSs, there appears to be a gap between the academic texts produced by NNSs and those by native –speakers (NSs), and problems may arise in writing acceptable academic prose in many cases (Flowerdew, 2008). The writing-related challenges facing NNS academic writers are identified by Tang as well (2012). She claims it is the necessity or personal choice that accounts for the increasing number of NNSs academics to publish their academic work in English.

Compared with native speakers' linguistic priorities in producing academic writings, the difficulties and disadvantages for non-native academics to publish in English cannot be neglected. As Ferguson *et al* (2011) noticed: '...there are strongly voiced anxieties that the dominance of English unfairly advantages native speakers of English while hampering non-native academic efforts to secure publication in high impact, international journals, almost all of which publish in English, most notably in the nature sciences' (p41). Language requirements for publication also mount a challenge for non-native academics. Flowerdew echoes: 'as the need for academics to publish in English worldwide increases, questions inevitably arise regarding standards of English in academic publication, and this language requirement is a challenge for many English as an Additional Language (EAL) writers' (Flowerdew, 2008, cited in Koyalán and Mumford, 2011:113).

1.1.3 Position of Medicine and Medical Discourse in Modern World

Medicine, as a scientific field, fulfils a remarkable function in the progress of human civilization for it concerns with health care for all human beings at any times. The significance of medicine in human society is addressed by Gotti and Salager-Meyer (2006) as follows:

Since the existence of human society, medicine has thus occupied a prominent place in all cultures and times, because it represents a common concern of all human beings: their health and lives. This is why the delivery of high quality, affordable access to healthcare is at the top of the political agenda in most parts of the world. Never before has medicine played such an important, absorbing and fundamental function as that observed today.

(Gotti and Salager-Meyer 2006: 10)

It seems evident that with the development of human society, medical research has been and will receive much more attention than ever before. The development of medicine in modern society could be witnessed by two aspects of

evidence, which involve more annual published medical journals and academic investigations on medical discourse (Gotti and Salager-Meyer 2006). In this regard, focusing on language learners' difficulties in publishing medical explorations in English, the present research could, to some extent, foster medical advancement in a society.

From social constructivist perspective, the appearance of medical discourse represents medical scientists' 'cooperative and competitive struggle to create knowledge base of their field, to establish themselves in relation to other scientists and to gain influence and control over political and socio-economic means' (Gunnarsson, 2009: 55). Above all, written medical discourse, as a specific genre, plays a central role in strategically displaying medical knowledge and 'as a group marker and the establishment of firmer conventions' for medical discourse community (Sarangi and Roberts, 1999; Gunnarsson, 2009: 66). Based on the impacts of medical discourse on human society and the close relations between medical writing and its discourse community, this thesis will concentrate on relevant analyses on written medical discourse.

1.2 Research Context

English enjoys great popularity in formal education of China. According to official estimate, 'more than 176.7 million Chinese students studied English in 2005' (Graddol, 2006, cited in Cheng, 2011: 134). Compared with the population learning other second/foreign languages in China, 'English is the most widely learned and used language foreign in China than in other countries' (Cheng, 2011: 134). The phenomenon lies in the conception that being a global language, English is considered as 'a necessary tool that facilitates access to modern scientific and technological knowledge and information' and 'a way to enable China to join the global village and to

strengthen its economy' (Cheng, 2011: 134).

On the other hand, learning English as a foreign language within Chinese context is seen as 'a rather daunting task' (Wu, 2001: 191). The actual situation of English Language Teaching (ELT) in China 'seems to fall far short of meeting the needs generated from the country's rapid developments in economy, science, and technology, and from increasingly contact with the outside world' (Qin, 1999, cited in Wu, 2001: 191). The following sections will present and delineate the current situation of English language teaching at different levels and their existential problems. Based on these descriptions, a more thorough and clear image of the research context for the thesis could be produced.

1.2.1 Teaching Writing as EFL for Undergraduates in China

Influenced by traditional teaching methods (grammar-translation method, in particular), second language (English) instruction in Chinese higher education has placed undue emphasis upon the recognition of individual words and explanation of grammatical structures/rules, which neglects the specific purposes for second language learning and teaching, especially for learners studying English for Specific Purposes (ESP). The significant feature of this traditional teaching model is that it is teacher-centered, highlighting teachers' dominant role in the classroom teaching. Teachers and textbooks are regarded as the authoritative sources of what to learn in language learning. In this process of language learning, students are positioned as passive receivers of knowledge, almost without any chances for practice of communication in the classroom. Under such a circumstance, intensive reading has been set the primary goal of teaching and learning. This phenomenon is still quite prevalent nowadays in higher institutions in China (Zou, 2000, Qiao *et al*, 2010).

Faced with such a reality, the New College English Curriculum Requirements for English teaching in higher education in China was published in 2004. The New Requirements put strong emphasis on the development of students' communicative skills, which involve listening, speaking, reading, writing and translating. For writing practice at the college level, the Requirements stress that students are 'expected to write in compositions, which should be complete in content; appropriate in diction and coherent in discourse' (p18). The New Requirements also highlight that 'students are expected to be able to get a command of some writing strategies during the process of language study at college level' (p18). This is the first time that national government puts forward the requirements for college writing in English.

However, the fact is that despite the manipulation of reforms in college English teaching in China, which stresses the transformation of traditional teacher-centered instruction model to learner-centered acquisition with its main focus upon the development of learners' communicative competence, the traditional teaching model still has its pervasiveness in the classrooms nowadays. As the investigations of Wang (2009), and Liu and Dai (2003) indicate, the reforms have produced some significant changes in teachers' teaching concepts and teaching methods (e.g. introduction of multi-media in the classroom), but lower communicative competence of learners is still a serious and universal problem. Chen (2008) reports that the present English language education is criticized (at the college level) nationwide for the so-called "high investment in language learning and learners' low output", which reflects that Chinese language learners display the lower level language performance in communication in English speaking and writing after more than ten years of language learning. The causes for this situation, Chen (2008) elaborates, may be due to two aspects. For a long time, English education in China has based its center on preparation for students

to take English tests, which would contribute to English learners' low motivation for language learning. Another reason lies in the fact that any teaching method, if it does not accord with the principles of language acquisition and learning, could not effectively improve learner's communicative skills.

According to the regulations of the ministry of education in China, Chinese students begin with their English language learning when they are in their third grade of primary school. English has been a compulsory course from secondary school up till to college education, which could be about ten years of learning experience. At college level (for BA degree programmes), English language learners are normally divided into non-English majors and English majors, with the former amounting to the larger proportion of language learning population. In a broad sense, whenever research or problems in college English teaching are discussed, it is non-English major students that are the focus. No matter what are their specialized areas at college, non-English major college students in China are required to take English as a rudimentary course, which normally lasts for two years. Nevertheless, after the first two years of English language learning at college, students need to participate in a national English examination (College English Test Band 4 or Band 6, with their abbreviations respectively as CET4 or CET6) to get a certificate, which will show their English level. Most of the colleges and universities in China would normally regard this English certificate as a must for their students to graduate. Under such circumstances, most college students have been preparing for the test from the first day of their college life. The arrangement and organization of English instruction in the classroom is 'test oriented' (Ren and Wang, 2015: 22). Under such circumstances, teachers normally concentrate on teaching some strategies for writing formats with the aim of preparing students for CETs. The embarrassing situation resulting from these English tests is that

most students can obtain higher test score in CET4 or CET6, but cannot perform effective communication in real life (Chen, 2008).

Owing to the limited teaching hours, the main task for English teachers at college is to complete the teaching schedule (normally four hours per week), which only involves intensive reading and listening instruction (Qiao *et al*, 2010). Because of the large number of students in every class (average number of students, 45-50), teachers could only dedicate their limited teaching hours to detailed explanations of meanings and doing exercises with almost no possibility of providing chances for students' participation in the class. In this way, students basically have no opportunity to practice their language skills, and students' interest in language learning gradually diminishes (Wang, 2002, Wang, 2009, and Qiao *et al*, 2010). Based on this reality, the development of students' abilities in reading and writing could not be attended to in the classroom, which inevitably leads to the fact that students are afraid of writing in English whenever they are required to do so (Deng, 2002). In comparison with other language skills, writing is usually neglected by both learners and teachers (Yi, 2010). Whenever some writing sessions are conducted, it is treated as 'a discrete skill, separate from speaking, reading and translation' (You, 2004: 200). A major component in writing instruction focuses on following the 'guidance of nationally unified syllabus and examination system' and teachers tend to concentrate on 'teaching of correct form and test-taking skills' (You, 2004: 108).

In respect to medical students at college, like college students in other specialised areas, they are also required to study English (for general purposes) as a compulsory course for two years. After that, medical English (for specific purposes) as an elective course, can be selected towards the accumulation of their credit. With only two hours for this ESP course per week, teachers could only dominate the class

focusing on the introduction of medical terminologies and explanation of a textbook unit (which normally consist of a main English text with a new words list, followed by subsequent exercises) sentence by sentence, without offering students with any opportunities to enhance their reading and writing skills in medical English (Xu and Sun, 2007, and Xu, 2010). Instructed in this way, students commonly attempt to recognise and memorise medical terms during the whole process, taking it for granted that as long as they have knowledge of many medical terms and some grammatical structures, they can have a good understanding of medical texts and may also have the capability to write purposeful and meaningful medical English-medium essays whenever necessary (Li, 2009). Having been instructed in this way for several years, medical students may encounter bigger challenges in language learning once they become MA or PhD candidates.

1.2.2 Teaching Writing in English as EFL for Postgraduates in China

During the process of postgraduate studies, English is still one of the many compulsory courses for students. In recent years, with the expanding number of medical students for professional MA degrees (candidates are required to have at least five years experience of being a medical practitioner), the general English level for these MA students is lower since most of them have given up English learning for about eight to ten years. As far as the MA medical students in my university are concerned, the proportion of medical students for professional MA degrees is comparatively large, which results from the fact that medicine is one of the few disciplines being approved by the ministry of education to enroll in students for professional MA degrees. In contrast to the large number of college students for BA degrees in China, however, the proportion of MA or PhD students is relatively small, which may contribute to the fact that there is not a comprehensive English syllabus

outlining the specific purposes for second language teaching and learning for MA programmes.

With regard to the existing syllabus for PhD programmes, it was published in 1998, which just provided the general framework for English teaching/learning, such as the approximate teaching hours each term, the criterion for mastery of vocabulary for language learners, and requirements for teaching skills of reading and writing as well as speaking and listening. Since then, there has not been a revised syllabus to meet the requirements for PhD language learners, especially those within ESP context in the new millennium. Without an up-dated guidance for English teaching and learning for MA and PhD programmes, English language instruction in the classroom normally indicates a flexible way, which may or may not attend to the learners' needs for writing at MA or doctoral level. As far as the university where I have been teaching is concerned, teaching English in the classroom is normally composed of just teaching intensive reading for MA level. As for PhD candidates, only some writing strategies and writing formats are provided during their candidature. As for my university, there are only four teaching hours a week which will last for three months. During this three-month period, just some superficial academic skills for reading, writing and spoken skills are involved. In this sense, the current syllabus does not cover any specific requirement and design of classroom activities for academic writing, let alone the importance of genre concept in writing practice.

1.2.3 Chinese Scholars' Needs in Writing English as a Foreign Language

In terms of the 'unprecedented importance' of English language in China and 'the dominance of English in academic discourse internationally' (Gil and Adamson, 2011: 23, 30), English language proficiency for many Chinese academics has become

a prerequisite to negotiate and interact within a disciplinary culture. In the meanwhile, many Chinese mainland universities nowadays are trying very hard to transform themselves into internationally renowned ones in the world to meet the trend of globalisation. From this departure, 'research output, or the number and quality of publications by its academics is generally seen as an important index of the level of success of a university's internationalization programme' (Flowerdew and Li, 2009: 159). In addition, it is a necessity for postgraduates in the pursuit of science degrees in particular to fulfill the requirement of publishing in English journals with Science Citation Index (SCI) (Li, 2006). In fact, most universities in China adopt the policy for PhD candidates, which states 'publish or no degree' (Li, 2006: 1). As Cargrill, O'Connor and Li echo, publishing an internationally indexed academic paper in English has been 'a graduation requirement in many Chinese universities' for 'doctoral science students' (2012: 61). Faced with such a requirement, the pressure to publish in international journals with high impact factors in English by many Chinese scholars is growing (Qiu, 2010).

1.3 Motivations for the Research

1.3.1 Orientations of Previous Research on Academic Discourse

One of the common genres among written academic discourse, research articles (RAs), has been much focused on by scholars during the past decades. Research on RAs in different academic disciplines has been conducted through genre analysis using Swales's (1990) move analysis (e.g. Samraj, 2002), cross-cultural contrastive analysis (e.g. Hirano, 2009), multi-dimensional register analysis (e.g. Biber, *et al*, 2007), and Systemic Functional Linguistics (SFL) analysis (e.g. Gosden, 1992). Notwithstanding, different aspects of linguistic features for language use in RAs have

also been approached such as rhetorical structures (e.g. Martínez, 2001; Lorés, 2004; Liu and Braine, 2005; Lim, 2006), conditionals (Warchat, 2010), stance (Hyland, 2005), evaluation (Thetela, 1997), hedging (Hyland, 1996), personal pronouns (Kuo, 1999), and academic criticisms (Martín-Martín and Burgess, 2004). All these research contribute to our understanding of the features for this specific academic genre. In contrast to this substantial amount of studies on academic RAs, the investigations of academic review articles are few, though some linguists have conducted research on textbooks (e.g. Hyland, 2002), and book reviews (Tse and Hyland, 2006). However, despite these vast amount of research on written academic discourse, research on medical discourse has been sparse. The existing research on medical discourse mainly focuses on one specific aspects of linguistic features in medical RAs, such as metonymy and passive voice (e.g. Rundblad, 2007), conditionals (e.g. Ferguson, 2001), lexical frequency (e.g. Chen and Ge, 2007), and verb tense and modality (Salager-Meyer, 1992). With regard to studies on medical review articles, to my knowledge, there is quite limited research on this genre (e.g. Salager-Meyer, 1992, Webber, 1994).

1.3.2 Personal Teaching Experience in a Higher Institute in China

For the past several years, I have been teaching PhD students to improve their reading and writing abilities in a medical university of mainland China. The experience makes me deeply impressed by the situation that limited language input frequently positions students into the inappropriate expressions of theoretical concepts or empirical achievements. Exposure to non-authentic English textbooks during most of the time of their English language learning may be the main cause for the deficiency of language input. What they have learned from textbooks is not natural, authentic language, which can be a factor interfering in the appropriateness for their language output in language communication (Chen, 2008). In addition to inappropriateness in

written communication, it also suggests that the PhD students may experience difficulties in organizing ideas and expressing attitudes and comments in academic discourse. Many of these problems have been identified by some linguistic experts (Coates *et al*, 2002; Benfield and Feak, 2006; Belcher, 2007). The lack of input coupled with the lack of previous teaching in improving reading and writing skills, contributes to the fact that most PhD candidates cannot organise and express their ideas effectively in English. The crux of the intractable issue now is how English teachers in higher institutions of China could carry out plausible reforms to satisfy learners' needs for publishing in acceptable written English to meet the requirements for graduation, which suggests, however, a deficiency in the present syllabus.

For academic purposes and for the needs of career development, these medical PhD candidates need to write in the genres such as research articles or review articles to display their empirical research and to convey their comments on recent research developments in methods or techniques. Among the different sections in these two genres, the Introductions and Discussions in RAs, and Beginning and Conclusion sections in review articles raise a challenge for students in English writing. In these sections of academic discourse, it normally requires writers to organise their research ideas and spell out main objectives and research methodology, and evaluate, discuss and comment on their research findings. These challenges conform to that in the study by Flowerdew (2001). Based on the study performed by Flowerdew (2001), it is found that problems of syntax and 'unclear modality' may contribute to the comprehension difficulties in academic writings. Apart from these problems, Introductions and Discussions have been identified as 'diverging from the accepted norms of dealing with the topic' (Flowerdew 2001:145). From this perspective, the problems arising from textual organisation and construal of interpersonal evaluative

meanings in the Introduction and Discussion sections (or the Beginning and Conclusion sections) in two medical genres are to be approached in this thesis. Textual organisation will be examined through thematic structures in SFL while evaluative aspects of meanings will be explored using Appraisal theory. In Appraisal system, resources for construal of intersubjective stances are included within Engagement category (Marin and White, 2008). In this sense, I intend not to present a complete Appraisal analysis, but focusing primarily on systems of Engagement and Graduation, from which useful strategies could be elicited.

The impetus for the present study is inspired by this gap in research on medical academic discourse and by personal long-time teaching experience in a medical university in China. From this empirical and practical perspective, it is hoped and argued that the research outcomes out of this thesis may have pedagogical implications to my own future teaching career, and could provide practical assistance in improving writing practice for medical students and staff. In aforementioned research context of the particular historical background for second language teaching and learning in China, there still exists a big discrepancy between second language instruction and students' practical needs. My personal teaching experience in a higher institute, to some extent, witnesses this long standing situation.

1.4 Research Methodology

Treating written academic discourse as a social product and discourse community, Systemic Functional Linguistics (SFL) highlights two aspects of things, namely that language is a social semiotic system for meaning construal, and meaning is created in the process of mutual exchange in human society (Halliday, 1978). Based on the delineation in section 1.3.2, one of the problems medical PhD candidates

confront with involves in reviewing relevant literature, from which their research aims and methods could be elicited and addressed. Another problem may be reflected by discussing, arguing and evaluating related research findings. It is from this departure point, this thesis will mainly focus on examining textual organisation and construal of interpersonal aspect of meanings. Textual organisation will be handled conceptualising Theme-Rheme structures in these two medical genres, following the theoretical framework of SFL. On the other hand, interpersonal aspect of meaning in both sections of these two medical academic genres will also be dealt with, following Appraisal theory by Martin and White (2008). Taking the view of scientific academic writing as a social construct, Appraisal model adopts Bakhtin's dialogism and intertextuality of academic discourse in dealing with intersubjective stance in texts. Grounded in SFL, Appraisal could be taken as a more comprehensive model to theorize interpersonal evaluative meanings, which not only focuses on the interactional feature of texts, but also stresses the interrelations between texts and pretexts. In this way, it is argued that the exploration of textual organisation (Theme-Rheme) structure and intersubjective stance could help medical PhD candidates to write academic papers in English for publication.

1.5 Aims and Significance of the Research

1.5.1 Aims of the Research

With the above elaboration, a discourse-based pedagogy could be a better alternative to change the present teaching situation in Chinese higher education and meet the needs of learners' in ESP contexts. The objective of this thesis is to examine textual organisation from the perspective of thematic choices, and interpersonal evaluative meaning in medical discourse in order to provide an applicable model to

assist ESP students to write acceptable informative and persuasive academic writings. To serve this purpose, the research will adopt a Systemic Functional Linguistics (SFL) theoretical framework to investigate thematic structures in medical research articles (RAs) and medical reviews to understand their textual functions within a socially cultural academic context. Interpersonal evaluative aspects of meanings reflect how writers evaluate by interaction with readers in academic discourse, for which Appraisal theoretical model for intersubjective stance will be employed. The selection of these two different genres of medical academic texts is based on the practical needs of PhD candidates for publishing in English.

Concentrating on the Introduction and Discussion of two medical written genres results from the difficulties and problems medical PhD students are faced for publication in English. On one hand, the functional aim for Introduction section of RAs is 'to provide a context and justification for the writer's own study' (Hood, 2004:16). The problem in this section for NNSs may arise from their lack of abilities for generalising the research context for their investigation and eliciting the problems from the previous related studies in a certain area, which need to be examined and solved to some extent. On the other, the 'argumentative purpose' of the Discussion is that 'writers evaluate and interpret the data obtained in relation to the problem presented, and attempt to persuade the readers of the relevance of the findings in relation to other findings, leading to the construction of knowledge' (Martínez, 2003: 105). In a sense, one of the difficulties in academic writing 'appears to be due to the argumentative nature of the section and to low competence, particularly the command of an active epistemic lexicon' (Martínez, 2003: 108). It is based on these likely problems in these two sections that the study aims to find plausible solutions.

Two corpora will be established for the study. One corpus consists of published medical research articles and medical review articles from internationally famous medical journals, while the other corpus is made up of unpublished research articles and review articles by medical students (L2 writings). By means of comparison of textual and interpersonal features between the two corpora, it is hoped that a useful model could be elicited for application in ESP context.

1.5.2 Significance of the Research

Following the theoretical framework of SFL, the investigation of how writers organise their academic prose will help medical PhD candidates pay more attention to the way of constructing scientific academic knowledge and reality. In the meanwhile, concentrating on dialogistic positioning and intertextuality in written academic texts may guide these candidates to view academic texts as social and cultural activities of institutional constitution. Finally, this study concerning with textual organisation and intersubjective stance in two genres of medical written discourse may seem to be a contribution to the existing linguistic theories.

1.6 Organisation of the Thesis

The thesis consists of nine chapters. Chapter One serves the purpose of introducing the research, while Chapter Two considers theoretical background for the research. Research design is explained in Chapter Three. Data analyses for textual organisation are focused on through Chapter Four (Thematic structure in medical research articles) and Chapter Five (Theme-Rheme structure in medical reviews). Evaluative aspect of meanings by means of Engagement and Graduation within Appraisal system are examined in Chapter Six (concerning medical RA genre) and Chapter Seven (dealing with medical review genre). Chapter Eight summarises the

major findings of the research and a qualitative description of both published and students' draft writings is presented. Finally, Chapter Nine discusses implications and conclusions resulted from the present study.

Chapter Two Theoretical Backgrounds

2.1 Research on Academic Writings

2.1.1 Features of Academic Writings

According to Hyland, 'academic discourse refers to ways of thinking and using language which exist in the academy' (Hyland, 2009: 1). Academics employ certain strategies to write, argue and negotiate institutional knowledge within communities through texts. It is obvious that there is a close link between academic writings and **discourse community**. To facilitate the progress of scientific investigations, it is unavoidable and necessary for scientists from various domains to communicate with other members of the community. In this sense, academic writings could be viewed as reflecting language use 'in ways specific to particular social groups', through which members 'form social realities, personal identities and professional institutions' (Hyland, 2009: 1).

To every discourse community, **genre** is an inherent component (Orna-Montesinos, 2012). Lemke (1994) theorises the significance of genre to academic discourse and communities: 'Genres have the force of any social institution: they constitute a normative order in relation to which we make sense of texts and judge texts. Construing a text as being of a certain genre activates expectations about that text for readers in a particular community' (p1). To get a communicative and persuasive communication within an academic community, members negotiate with each other through genres (Bhatia, 1997). As for the importance of genre in academic and disciplinary communication, Trosborg illustrates as follows:

Genres are the media through which scholars and scientists communicate with their peers. Genres are intimately linked to the discipline's methodology, packaging information in ways that conform to a discipline's norms, values and ideology. In using the genres customarily employed by other members of their discourse community, disciplinary actors help constitute the community and reproduce it.

(Trosborg, 2000: vii-viii)

Given the close relations between academic text and its organisation in different genres, Gotti, Berkenkotter and Bhatia (2012: 9) state: 'academic communication greatly relies on compliance with textual norms governing the construction of its different genres'. Apart from this, a number of skills and strategies may be needed to produce an academic text in different genres regarding content, ways of communication, readers' participatory academic interests and likelihood of readers' being persuaded (Hyland & Bondi, 2006). Hyland (2006) highlights the importance of genre and the interrelations between genre and community as follows:

Genre has been an enormously valuable tool in providing more powerful means of exploring situated language use and allowing us to see texts as stabilized sites of social action. Genre and community together provide a descriptive and explanatory framework of how meanings are socially constructed.

(Hyland, 2006: 17-18)

Thus, academic community contributes to the textual realisations and exchanges of information by means of genres. As Gotti, Berkenkotter and Bhatia summarise:

Genre not only provides a conventional framework but also affects textual features and their conceptual and rhetorical development. The academic community, as a social entity, has established its own genres and textual rules of interaction for an effective transmission of information among its members.

(Gotti, Berkenkotter and Bhatia, 2012: 10)

In addition, there exists correlation between discourse community and **disciplines**. Disciplines may reflect 'institutional conveniences, networks of

communication, domains of values and modes of enquiry' in the construction of academic writings (Hyland, 2006: 18). When it comes to the investigation of certain features within an academic domain, what the members of a community within an academic domain would manifest, argue and persuade may provide researchers with 'a framework for conceptualizing the expectations, conventions and practices which influence academic communication' (Hyland, 2006: 20). From this perspective, ***disciplinary variations or cultures*** in the discursal construction of professional knowledge may be 'implicated' in discourse community due to the shared 'common objective in the production and communication of knowledge' (Hyland, 2006: 20). That is, the presentation of academic arguments needs to be carried out in acceptable and customary ways towards members of the academic community within a discipline (Hewing, 2006). Academic writings could be seen as 'embodying the social negotiation of disciplinary inquiry, revealing how knowledge is constructed, negotiated and made persuasive' (Hyland, 2004: 3). In view of academic writing as a socio-cognitive process, Hewings continues to argue:

Academic writing is seen as part of the process of negotiating what is to be taken as accepted knowledge within a discipline and this is best achieved through modes of expression that have become conventionalised through the particular social and cultural contexts in which they arise.

(Hewings, 2006: 10)

Academic text occupies the central position of 'disciplines' social practice and ways of thinking' (Hyland, 2006: 21) whereby individual members of an academic disciplinary community present their arguments, 'construct disciplinary knowledge and at the same time negotiate their own professional identity as members of the community' (Orna-Montesinos, 2012: 1). In correspondence to 'assumptions, methods, and bodies of knowledge' of a community, the construction of academic writings may

have the necessity of adopting 'sets of rhetorical choices' to gain 'support, express collegiality, resolve difficulties and avoid disagreement' (Hyland, 2006: 21). With regard to the importance of academic writings in academic life, Hyland claims that 'there is a clear consensus on the importance of written texts in academic life—a recognition that understanding the disciplines involves understanding their discourses' (2004: 3).

Finally, academic texts in different genres could be viewed as being *interpersonal* and *dialogic* (Hyland, 2014; Livnat, 2012; Lorés-Sanz, Mur-Dueñas and Lafuente-Millán, 2010; Thibault, 2002). As discussed above, any academic writing could be considered as the writers' persuasive maneuvers, which could be achieved through 'writer's development of an appropriate relationship with his or her readers' with the 'demonstration of absolute truth, empirical evidence or flawless logic' (Hyland, 2014: 1). In terms of the significance of 'text-as-interaction' perspective (Thibault, 2002) contributing to successful communication among academics, Lorés-Sanz, Mur-Dueñas and Lafuente-Millán (2010) echo that: 'It seems unquestionable now that the interpersonal component of texts (i.e. the ways in which the writers project themselves and their audience in the discourse) is an essential factor determining the success of scholarly communication...' (p1). They take the view that 'interpersonality is a rhetorical feature' in written academic discourse, and 'textual manifestation of that interpersonal component' could be reached through different perspectives (p2). With this apart, *evaluative* meaning in academic texts is highlighted through the occurrence of interaction and persuasion (Hunston, 1994). In the meanwhile, in the construction of interpersonal component in texts, academic writers would make great attempts to avoid 'hostile peer criticism' and try to strengthen the 'scientific claims' in order to meet the expectations of other members of their communities (Golebiowski, 2011: 203).

2.1.2 Different Perspectives on Academic Writings within SFL

Systemic Functional Linguistics (SFL) approaches language as 'social semiotic' (Halliday, 2001:1), formulating the idea that 'language exists in society. To understand how language functions is to understand the relationship between language and society' (Hasan, 2005: 56). And more importantly, Hasan (2005) stresses: knowledge for human beings is 'a semiotic construal' and 'the growth of knowledge' is inseparable from 'the semiotic activity of human beings in societies' (p56). SFL takes the view that 'language consists of text or discourse' (Halliday, 2001: 2), relating language in use (text) to its social context of situation, examining the lexicogrammatical features of texts (Halliday, 1992, 1994). In this sense, 'sociocultural context of situation' plays an essential part in the construal of 'meaning potential' (Halliday, 2001: 2-3). As Christie and Unsworth (2000) echo that: 'descriptions of language are completely interconnected with descriptions of the contexts in which language is used' (p1). And they also elaborate three distinctive characteristics for SFL. In the first place, the development of SFL theory 'always corresponds to' to the issues or problems 'about language in applied contexts' (Christie and Unsworth, 2000: 1). In addition, within SFL language is described as a system of 'meaning potential'. From this departure point, 'SFL is concerned to describe "meaning potential" – the linguistic options or choices that are available to construct meanings in particular [social] contexts' (Christie and Unsworth, 2000: 2).

With respect to the interpretation of scientific and technical language, Halliday and Martin (1996) take the view that 'discourses are [semiotic] tools' (p221). As 'a key discourse of modernity' in a society, the study of scientific discourse can both 'lead to the understanding of modern intellectual environment and empowerment of those who seek to enter it' (Shaw, 2007: 2). Given the significance of scientific

discourse analysis in understanding scientific progress in western culture, Halliday and Martin (1996) propound that 'without a robust interpretation of these [scientific] discourses, any understanding of the development of material technology in our culture and the ways in which it can be mastered is necessarily incomplete' (p221). Based on the aforementioned delineation, SFL theory could be an important analytic approach in understanding and interpreting scientific endeavours with educational values in human society. They continue to highlight that 'a socially-based linguistic analysis of the texts and discourses of scientific work is an important political and pedagogical move' (1996: xii). Within this social-semiotic framework of SFL, academic writings can be treated from different perspectives grounded on related research.

Academic discourse is frequently handled from genre-based perspective, taking the view of 'discourse as genre' (Bhatia, 2008: 20). This perspective focuses on examination of rhetorical constructions and the ways of their being interpreted through genre analysis (e.g. Lewin, Fine and Young, 2001). According to Hyland (2008), metadiscourse is 'used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community' (p37). A metadiscoursal view concentrates on both 'organizational and evaluative features of interaction' (Hyland, 2008: 48) throughout academic texts. These two aspects are categorised into two dimensions involving 'interactive' and 'interactional' resources (Hyland, 2008: 49). Interactive resources 'help to guide the reader through the text', while interactional ones 'involve the reader in the text' (p49). Several scholars have made attempts to conduct investigations concerning with metadiscourse in academic discourse. Bamford and Bondi (2005) edited a volume of chapters, highlighting that as one of the features in academic discourse, metadiscourse is a characterising textual patterning which helps reader or listeners to

recognise the specific genre. A cross-cultural computer-assisted examination of metadiscourse in L2 writings, which made comparison of written argumentative texts written by Swedish English learners with those written by native English speakers (Ädel, 2006: 2). This study identified that some factors may contribute to the variation in metadiscourse between non-native and native speaker writers. These factors may involve writer's familiarity of argumentative writings and possible cultural conventions. Linguistic features of academic writings may be explored across varieties of different foreign languages and in various academic disciplines. This is normally seen as cross-national (cross-cultural) and cross-linguistic view towards academic discourse. From this perspective, linguistic features, such as citation, modality, authorial identity, and textual voice, etc in academic discourse were explored, with defining academic discourse as 'acts of communication and/or interaction' (Suomela-Salmi and Dervin, 2009: 6) between writers and their discourse community. In addition, academic writings could be approached with a pragmatic view, through which relevance theory approach is adapted in understanding the cultural differences (e.g. Owtram, 2010).

As a significant mode in academic communication, academic writings have attracted much interest and attention worldwide. Although experts and scholars have made great endeavours to explore the various aspects of academic writings in different genres, some areas have not been exhaustively investigated. As suggested above, explorations of rhetorical structures in academic writings from discourse analytical view of SFL are insufficient, in particular those concerning Theme/Rheme development. In particular, there is an obvious deficiency in examinations of Theme/Rheme in both genres of medical research articles (RAs) and medical reviews. While much previous research has been concerned with the investigations of interpersonal meanings in SFL in order to visualise the prominent features of interaction and evaluation in academic

writings, there seems to be the gap in the systematic examinations concentrating on both medical RA and review genres. In terms of investigations in medical genres, previous research has not make any attempts to explore both textual functions and interpersonal meanings simultaneously.

2.2 Systemic Functional Linguistics and Discourse Analysis

As outlined earlier in section 2.1.2 concerning genre-based view and SFL approach to discourse analysis, this section will provide relevant theoretical and research backgrounds to serve the research purposes for the thesis. Firstly, various approaches to the analysis of linguistic structures of discourse are theorised. Overviews of previous research on textual organisations of academic research articles and of medical discourse are handled in order to uncover the gap in this scientific domain. Finally, key concepts and theoretical features within SFL are specified to provide the research grounds on which this thesis is based.

2.2.1 Different Approaches to Linguistic Structure in Discourse Analysis

In respect to the historical development of various approaches to linguistic analysis, 'discourse analysis, the study of the use of language for communication, [has been] a rapidly-expanding field which is characterized by proliferating analytical methods and continuously renewed tools' (Georgakopoulou and Goutsos, 1997: viii). Significantly, discourse analysis, whether written or spoken, is 'the analysis of linguistic behavior beyond the limits of individual sentences, focusing primarily on the meaning constructed and interpreted as language is used in particular social contexts' (Bhatia, Flowerdew and Jones, 2008: 1). As for written discourse analysis, the importance of text is evident. As Kaplan and Grabe (2002) stress: '...we believe that [written] discourse analysis requires an emphasis on the text itself, though with additional

attention to the extra-textual context in which the text was produced' (p193). It could be claimed that the crucial aspect of discourse study 'involves relating text with context' (Widdowson, 2004: 34). To put it in detail, taking texts implicating in context, 'discourse analysis has to do with what might be meant by [texts] and what [texts] are taken to mean' (Widdowson, 2004: 35).

In terms of descriptive approach to illustrate linguistic structures, Mann, Matthiessen and Thompson (1992) have explored text structure using Rhetorical Structure Theory (RST). RST describes three principal types of linguistic structure in text: 'Holistic Structure, Relational Structure and Syntactic Structure' (p43), and basically RST is a 'theory of text organization' and is 'about how text works' (Taboada and Mann, 2006: 567, 423). In recent years, the application of RST has been extended to research in many areas such as 'computational linguistics, cross-linguistic studies, dialogue and multi-media' (Taboada and Mann, 2006: 567).

From the perspective of applied linguistics, studies of discourse can be approached focusing on different aspects of text structures. Previously employing the term Critical Linguistics (CL), and then Critical Discourse Analysis (CDA), CDA is involved in research drawing on 'the wider field of discourse analysis' which takes 'critical approaches to the use of language' (Wodak, 2005: xi) and is 'defined as a problem-oriented interdisciplinary research programme' (Wodak, 2011:38). Fairclough develops approaches which 'in some degree combine close analysis of language texts with a social orientation to discourse' (1992: 12). According to Fairclough, the approaches can be divided into 'non-critical' and 'critical', based on the 'nature of their social orientation to discourse' (p12). What CDA attends to is deconstructing 'socially-constructed machinery power' through linguistic analysis, which is based heavily on Systemic Functional Linguistic theory (Chilton, 2005: 21). To some extent, CDA

primarily contributes its attention to contemporary social problems and makes attempts to express its opposition to them. Lê and Lê (2009) highlight this focus in the following:

The main mission of CDA is to examine social injustice which is manifested in various social practices and to take a stance against social abuse, racism, social prejudice and discrimination against dominated or marginalised people with less power.

(Lê and Lê, 2009: 4)

Basically, there are two perspectives on relevant research within CDA: linguistically-oriented and non-linguistically oriented (Chilton, 2005). With regard to the prominent linguistic-oriented CDA, scholars mainly conduct their studies focusing on discourse (language use), with the insistence that 'language is the form of social-action', which can be 'elucidated, even unmasked by various kinds of linguistic analysis' (Chilton, 2005:20). Within the area of CDA, discourse studies can be dealt with 'variety of approaches in different theoretical models and research methods' (Wodak, 2011:38). Fairclough mainly focuses his research on 'order of discourse' and 'discourse formation' and Wodak's approach commonly indicates the features of 'sociolinguistics and ethnography', whereas van Dijk's studies is of 'cognitive orientation' (Chilton, 2005). Although these scholars vary in approaches to research within CDA, there is a common interest among them, which consists in 'the semiotic dimensions of power, identity politics and political-economic or cultural change in society' (Wodak, 2011:38). As Stubbs (1994) spells out: '[critical discourse analysis] argues that all linguistic usage encodes ideological positions, and studies how language mediates and represents the world from different points of views' (p201).

As far as descriptive analysis of written discourse is concerned, one of the most insightful ways into describing discourse organisation is to 'treat discourse as in some way the product of semantic relations holding between sentences or propositions'

(Hoey, 1991a: 17). Winter (1982) and Hoey (1991a) take the view that clause relations are sequential relations between clauses, and they regard clause relations as information structure accounting for the relations between a sentence and its context. On a large scale, clause relations can transcend the local stretches of text to form predicative patterns in the organization of text (Hoey, 2001). The predictive textual patterns are quite popular in a certain context of culture, which is referred to as culturally popular textual patterns (Hoey, 1991a, 2001). The concept of clause relations has significant implications for language pedagogy. On one hand, in reading practice, readers could make use of clause relations to 'comprehend the connections between [text's] various elements, to infer the nature of the connections' (MacCarthy and Carter, 1994: 54). More importantly, 'clause relations can reflect the text's interactivity', which may assist making inferences in the reading process, thus improving comprehensions (Hoey, 2001: 30). On the other, clause relations may have an impact upon improving learners' ability for text organisation since 'clause relations may combine in text to form recognizable patterns. ... the 'macro' patterns of text organization ...' ((MacCarthy and Carter, 1994:55), which may provide practical textual framework for learners to organize their writings (Hoey, 2001).

The concept of genre plays a prominent role in understanding of discourse. Genre can be defined as 'a socially recognized form' of a social group of members, and the analysis of genre aims to 'describe features of socially recognized forms and actions' (Tardy, 2011:55). In a sense, it could be claimed that genre analysis is 'an approach or set of analytic methods for studying particular texts within discourse', such as business texts, legal discourse (Tardy, 2011:55). More significantly, members of different social groups can express their expectations not only through linguistic forms but also by adopting rhetoric strategies, which are commonly embodied in genre. By

means of genre analysis, descriptions of these linguistic features or rhetoric strategies can indicate 'an understanding of the relationships between language and context, and produce valuable insights for language education' (Tardy, 2011:55). Within the area of applied linguistics, Bhatia (2008) specifies that 'genre analysis is the study of situated linguistic behavior in institutionalized academic or professional settings' (p22).

Broadly speaking, there are three research traditions/orientations in genre analysis, which involve Australian work following the tradition of systemic functional linguistics, Rhetoric Studies (North American New Rhetoric Studies) and teaching of English for specific purposes (Hyon, 1996). SFL model of genre gets emergence from 'linguists and teachers working to create a genre-based pedagogy' (Hyland, 2004b), considering genre as 'regularities of staged, goal-oriented social processes' (Bhatia, 2008: 22). As for New Rhetoric view of genre, it mainly follows 'Bakhtin's notion of dialogism' representing 'postmodern social and literary theories' taking 'the perspectives of genre as 'not being informed by a linguistic framework' (Hyland, 2004b: 25). Scholars focusing on teaching for ESP 'are interested in genre as a tool' in improving learners' communicative competence, which might help 'for understanding and teaching the kinds of writing' for 'non-native speakers in academic and professional contexts' (Hyland, 2004b: 25). Although these orientations of genre analysis differ in their research goals, contexts, and theoretical frameworks, they share some common grounds, which involve 'conventionalized construct' central to any description of generic structures, and the dynamic feature of genres. (Bhatia, 2008: 23). Above all, the analysis of genre from these different perspectives can provide useful implications for English language teaching and learning.

Corpus linguistics, the study of language, is to describe linguistic forms, with the aim of investigating linguistic variations and patterns of variations across a large

number of authentic texts in a specific discourse context or language variety (Biber, Connor and Upton, 2007). To realize these purposes, 'a set of procedures, or methods' may be relied on, among which 'well established' 'concordancing', in particular, is regarded as 'central' to corpus approach (McEnery and Hardie, 2012: 1). Advantages of a corpus approach lies in 'the source of evidence for linguistic description and argumentation'; and '[corpus linguistics] has also come to embody methodologies for linguistic description in which quantification of the distribution of linguistic items is part of the research activity' (Kennedy, 2000: 7). In addition, corpus research can provide researchers with representative data and relevant computational tools and techniques for discourse exploration, contributing to both qualitative and quantitative linguistic analysis, with possibilities of producing representative and convincing research outcomes (Biber, Conrad and Reppen, 1994a; Biber, 1999). Thus, the characteristics of corpus approach to linguistic analysis could be summarised in three aspects. Corpus analysis is 'an empirical approach to the description of language use' with the departure from actual authentic data/texts, which is operated 'within the framework of a contextual and functional theory of meaning' through adopting 'new technologies' (Tognin-Bonelli, 2001: 2). It is important to note that corpus linguistics is 'a means to an end', which implies that the applications of corpus linguistics can 'lead to insights beyond the realms of lexis or grammar' (McCarthy and O'Keeffe, 2010: 5). Significantly, corpus linguistics 'may refine and redefine a range of theories of language, and 'the development' of it contributes to 'the exploration of new theories of language' (McEnery and Hardie, 2012: 1).

It deserves to mention that Multi-dimensional (MD) discourse analysis, 'a more specialized corpus-based approach to the study of language use', focuses its research on discourse structure and organization. MD linguistic analysis can describe

and reflect 'how linguistic features co-occur in each text, and how patterns of linguistic features vary across individual texts, or across register and genres' (Biber *et al*, 2007:4). Using Biber's multi-dimensional model, Conner and Upton (2009), for instance, conducted a contrastive study investigating argumentative essays in two different cultures.

There seems a tendency in recent years that much more research on linguistic analysis has been corpus-based, combining discourse analysis with corpus linguistics. In relation to scientific articles, Teich and Holtz (2009), for example, examined colligation based on a corpus of articles using a SFL framework. Through a contrastive linguistic analysis, Kanté (2010) employed corpora consisting of French and English written texts in a broad area of academic disciplines to explore modality in finite noun complement clauses. Despite corpus-based research on written discourse studies, many scholars also attend to spoken texts by adopting this joint approach. Carter and McCarthy (1995) employed a conversational English corpus to examine the frequency of grammatical features in the corpus, focusing on helpful pedagogical insights to increase the awareness and knowledge of conversational grammar. In another study based on their CANCODE corpus of everyday spoken English, Carter and McCarthy (2004) investigated the nature of interpersonal relationships in everyday conversation. Biber (1988) also used computational tools, analysing variation dimensions in speech and writing and investigating register factors across languages and cultures (Biber, 1995). In their recent publication, Thompson and Hunston (2010) demonstrated a series of academic explorations which tries to 'bring together two approaches to the description of language; Systemic Functional Linguistics (SFL) and Corpus Linguistics (CL)' (Thompson and Hunston, 2010: 1). All these research manifest the latest trends in corpus-based approach linking with discourse analysis.

Systemic Functional Linguistics (SFL) views language from 'the social semiotic perspective' and employs functional grammatical description for linguistic forms in order to 'map the meaning potential (meaning construction) of a particular group or society' (Butt, 1996: xv). SFL, as 'a social linguistic theory', offers a 'model' of language system 'which can help to explain its [meaning] potential for use in the ways which have been described' (Painter, 1999: 37). Halliday highlights that the property of language is its 'semogenic power' with 'language as a meaning potential' lying behind the 'meaning-making system/network' (1997: 3). With respect to SFL, it takes language as 'an instrument for achieving social life and manifesting the culture' (Painter, 1999: 37), situating language in use (text) in relation to its social context of situation, examining the lexical-grammatical features of texts (Halliday, 1992, 1994a). With the SFL approach, the 'cohesive properties', that is the semantic creation of cohesive ties have also been attended to (Halliday and Hasan, 1976: 4). A significant feature of SFL is 'its insistence on linguistic study' of 'actual instances of language' ('authentic texts') as a whole (Bloor and Bloor, 2004: 5). Above all, SFL stresses the importance of 'analysis of texts', which may help us to better understand the linguistic system and how the construction of coherent meanings could be achieved (Bloor and Bloor, 2004: 6). In contrast to the other discourse analytical approaches within applied linguistics, it is evident to notice the priority and significance of SFL. As Fawcett (2000) evaluates: 'SFL is a holistic theory of language and its use in social contexts' (p17). To have a better understanding and knowledge of the nature of language and its use in context, the framework of SFL 'has the greatest potential', and SFL is 'the most promising of all current theories of language' (Fawcett, 2000: viii).

2.2.2 Systemic Functional Linguistics (SFL) -- A Theory of Resources for Semiotic Meaning Potential

The textual function in medical texts for this thesis will be examined using the theoretical framework of Systemic Functional Linguistics. Before depicting the relevant concepts and features for textual metafunction within SFL, some key notions and its development and prominent features of this linguistic theory will be presented.

2.2.2.1 Social Semiotic Meaning Potential – Language in Context

With regard to the origin and development of Systemic Functional Linguistics, the theory of SFL has its roots in 'Malinowski's anthropology' (Teich, 1999: 8; Halliday and Hasan, 2012) and in the work of 'Prague School and Hjelmslev' (Teich, 1999; Butler, 2003: 43). It was pioneered, extended and elaborated by Halliday who contributed to 'the earliest formulation' of this linguistic theory, particularly influenced by Firth's 'categories of system and structure, and characterization of meaning as function in context' (Butler, 2003: 43). SFL was then developed by Halliday and other scholars (e.g. Halliday & Hasan, 1976; Halliday & Matthiessen, 2004). SFL theory takes the view that human beings construe their experience through language as 'meaning potential' for 'understanding, representing and acting on [social] reality' (Halliday and Matthiessen, 1999: 1). In this sense, SFL is mainly concerned with 'the construal of human experience as a semantic system', with the central role of language in 'storing, exchanging and construing it', as well as language as the 'interpretative base' for description of the reality around the world (Halliday and Matthiessen, 1999: 1). SFL stresses the close ties between language and social context. As Martin (1997) summarises, what SFL focuses on is 'modelling both language and social context as semiotic systems in a relationship of realization with each other' (p4).

From a holistic view, SFL considers that language as a social semiotic, is a linguistic resource or system of meaning potential, by which human people 'fulfill [their] communicative goals' (Teich, 1999: 2; Halliday, 1978, 1994a). In Halliday's elaboration, SFL is an approach with 'an applicable description leading to an understanding of the enabling power of language' (Webster, 2009:1). The main feature of SFL approach lies in the delineation of language's 'social and cultural functions of linguistic communication' (Butler, 2003: 44). The linguistic description of meaning potential is semantically based on lexico-grammar, which enable people to construe experience and finally transform one's experience into meaning. More importantly, SFL's functional view to language is 'text-oriented', which could be reflected in constructing 'a model of context and of the relationship between text and context' (Butler, 2003: 47).

In addition, SFL takes language as 'a complex semiotic system', which is characterized by its linguistic resources comprised on three strata or levels with diverse metafunctions (Halliday, 1994a:15). The three levels, from lower to higher order, involve phonology, grammar (or precisely, lexicogrammar), and discourse semantics, which constitute the whole linguistic system for this theory. Within SFL emphasis is placed upon the higher level of semantic system, in which meaning is realized through the lower level of systems. From this perspective, the description of language in SFL focuses on the semantic linguistic system, which is grounded on lexicogrammar (Halliday, 1994a).

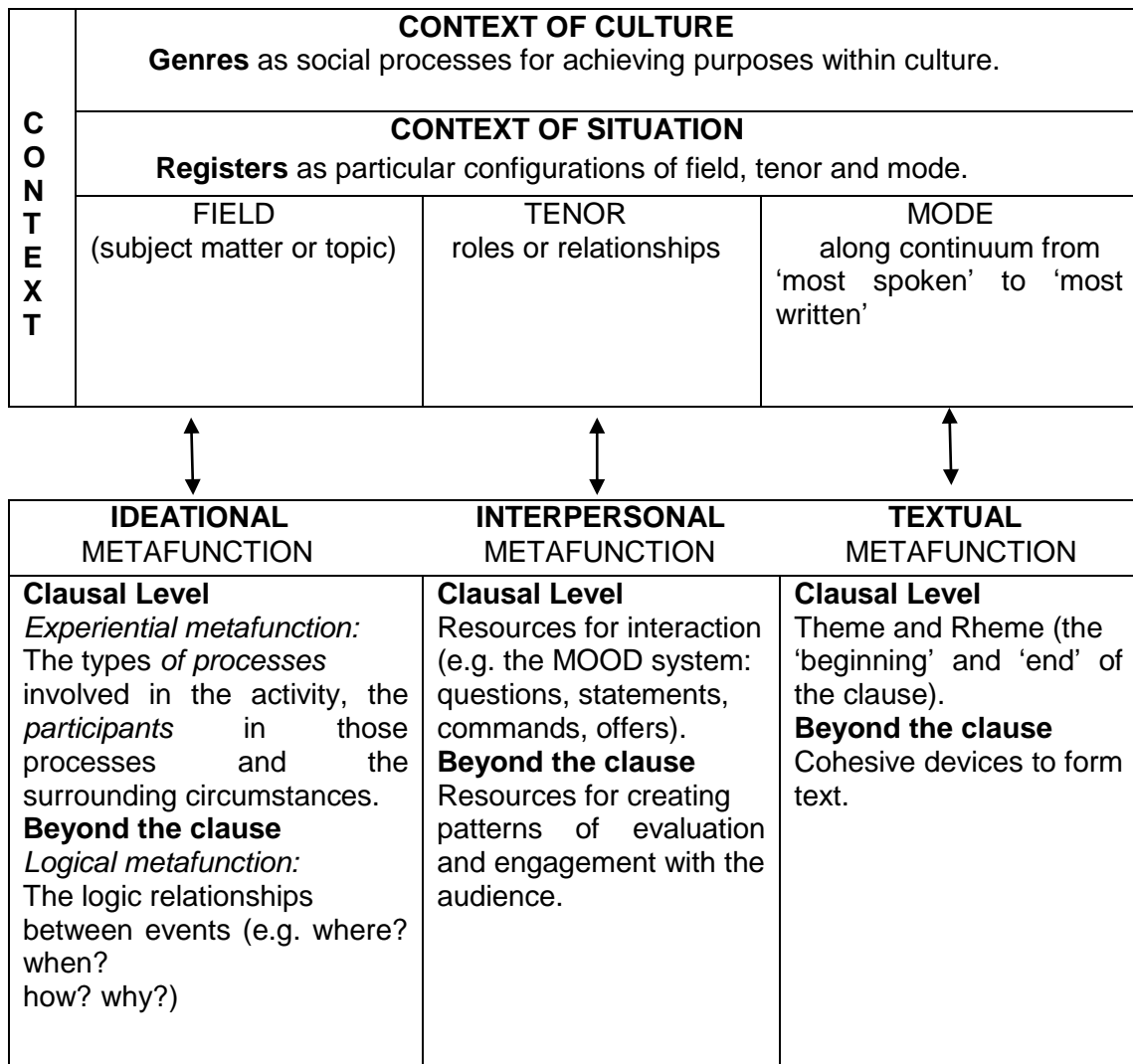


Figure 2.1 A Functional Model of Language within SFL

(Reproduced from Christie and Derewianka, 2008: 7)

A semantic system is theorised in its organisation with three functional components or metafunctions, which are referred to as ideational, interpersonal, and textual. Each of the three functional components performs their respective functions with each other simultaneously. The three types of metafunctions have their own distinct structures of linguistic resources. Ideational metafunction (experiential meaning) construes people's experience of the world, which is realized in the configuration of process, participants, and circumstances. Interpersonal meaning establishes social relationships, through the syntactic structures including choices between proposition

(indicative/statement) and proposals (questions) (Halliday, 1994a, Thompson, 2004). Finally textual meaning, with the function of creating discourse, is specified in terms of Theme and information structures (Webster, 2009). These three types of meanings are realized through clause, the most basic lexicogrammatical unit of semantic system. Within semantic system text is created by its constituent clause, and a text is realized in correlation with the social context of situation. A functional model of language within SFL could be illustrated in Figure 2.1.

2.2.2.2 Context of Situation, Register and Genre

The notion of context has a significant place in SFL model to linguistic analysis. As Hasan emphasizes that the concept of 'context' plays 'a crucial role' throughout the development of SFL, which aims to 'offer a scientific description of nature and function of language' (Hasan, 2009: 166). Hasan terms context as 'contextual configuration', which is 'central to text analysis' (Hasan, 2009: 185).

According to Halliday (1999), context is a type of situation delineating social happenings. He specifies that 'the context is some sort of environment; it's what's going on around, where language is somehow involved' (Halliday, 1999: 3). In terms of research on language and its context, there are basically two traditions. Halliday conceptualises them as follows:

American tradition of the study of language in context (with Sapir and Whorf) stress the culture as the context for language as system; and they see language as a form of reflection, as the construal of experience into a theory or model of reality.

British tradition of the study of language in context [Malinowski and Firth] stress the situation as the context for language as text; and they see language as a form of action, as the enactment of social relationships and social processes.

(Halliday, 1999: 6)

Taking those two traditions together, Halliday theorises the model of context of language for SFL, which is not only 'a theory about how people use language' but also 'a theory about the nature and evolution of language' (Halliday, 1999: 6).

Register description in SFL is conceptualised in context of situation, which is theorised metafunctionally, specified by three dimensions labeled as **field**, **tenor**, and **mode** (Halliday, 1978; Hasan, 2005). The three dimensions of context of situation correspond separately to the above three metafunctions of semantic systems, and determine the choices for the creation of types of meanings. Field, related to ideational context, decides on the choices (through transitivity) for experiential meaning. Tenor, in relation to interpersonal context, involves the selection of choices normally under the headings of mood and modality systems. For mode, it is associated with the textual context, determining choices for cohesion and thematic structures (Halliday, 1978 1994a). In sum, SFL provides a conceptual framework to describe language within a social context and takes language as a linguistic system of meaning potential. The basis for language description is on the grammatical resources of semantic discourse.

The 'language/context relationship' constitutes the main 'concern' for register theory within SFL (Eggins and Martin, 1997: 234). Butt and Wegener echo in that "context" is the concept which underpins the "semantic varieties" by which we can characterize situation types' (2005: 590). As mentioned above, the three dimensions of context of situation have a determining power in making meanings within linguistic systems, which shows the close relation of interdependence between language variety and social context. Variations in any aspects of context of situation may contribute to types of language varieties (Halliday, 1978, 1994a). Taking these three contextual variables in relation to types of language variety is called register (Hasan, 2009).

Considering the definition of register, Biber broadly takes register as 'a language variety viewed with respect to its context of use' (Biber and Finegan, 1994b: 4) while Butt and Wegener vividly terms it as 'semantic polyphonies (meaning varieties)' (2005: 591). As for Gregory, he claims context as 'generic situation' which is the 'internalized general knowledge of certain recurring situations in communication' (1988: 303). From the perspective of 'language as doing', when a 'generic situation' associates with 'meaning potential', it is called register (Gregory, 1988: 303). Halliday (1978) specifically defines it as 'the configuration of semantic resources that the member of a culture typically associates with a situation type' (p111). To state in a simpler way, register could be seen as 'a theoretical explanation of the common-sense observation that we use language differently in different situations' (Eggins and Martin, 1997: 234).

In SFL register is the central construct for text analysis since all languages display a certain variation according to use (Halliday, 1978). The central position of context in contributing to types of texts is specified by Hasan (2009) as that: 'distinct varieties of text could be recognized by reference to variation in language use correlating with variation in values of these parameters [field, tenor, and mode]' (p167). For Halliday (1978), he makes no distinction between the notions of register and genre, and takes genre (generic structure) within the concept of register.

In register and genre theory, the concept of genre is different from that in traditional use ('types of literary productions') (Eggins and Martin, 1997: 235). Eggins and Martin specify the differences of genre in two important aspects.

Firstly, linguistic definitions of genre draw on Russian literary theorist Bakhtin's identification of speech genres as 'relatively stable types' of interactive 'utterances' including spoken and written modes. Secondly, linguists define genres functionally in terms of their social purposes. Thus, different genres are different ways of using language to achieve different culturally established tasks, and texts of different genres are texts which are achieving different purposes in the culture.

(Eggins and Martin, 1997: 236)

Based on its central concern with the close relationship between language and social context of situation in SFL, Martin develops Australian approaches to genre within the systemic functional framework (Hyon, 1996) which distinguished between the two concepts of register and genre. Martin (1997) takes the view that a social context is 'a stratified system, comprising the levels of register and genre' (p389). In addition, Martin theorizes the major concern of genre is 'systems of social processes, where the principles for relating social processes to each other have to do with texture – the ways in which field, mode and tenor variables are phased together in a text' (Martin, 1997: 12). In this sense, as a level of context, genre is 'a staged, goal-oriented process' (Martin, 2002: 57; Martin and Rose, 2014). In a specific term, register is 'a pattern of linguistic choices, and genre a pattern of register choices' (Martin, 2002: 57).

In respect to the two concepts of register and genre within discourse studies, some linguists exclusively adopt register and ignore the genre (e.g. Biber, 1999) while others exclusively use genre (e.g. Swales, 2004). However, the two concepts are not separated and are central to discourse analysis. As Martin (1985) states: 'in addition to the semiotic system, it is necessary to consider two further semiotic systems, which will be referred to as register and genre' (p46). Martin (1997) elaborates this view as that in similarity to the relationship between lexicogrammar and discourse semantics, the relation of register and genre is complementary to the social context. In this aspect, 'the principles for relating texts to one another at the level of genre complement those at the

level of register' (Martin, 1997: 395). Since this study is conceptualized within the framework of SFL, the distinction between register and genre will be adopted: register is regarded as '[language] variation according to use' while genre could be taken as 'register plus purposes' (Thompson, 2004: 36). With the distinction between these two concepts, it can be stated that the study will take register as types of social experiences '(realities) by the members of [social] culture (Halliday, 1994b:136), and genre as a pattern of linguistic choices through which social groups of members construe meaning.

Based on the concepts of register and genre within SFL, there are three variables specifying register, which involve *field*, *tenor* and *mode*. These three variables determine the creation of types of meanings. Field is concerned with experiential meaning, focusing on what people are communicating. Tenor is associated with interpersonal context, dealing with the relationship between people. In relation to the textual context, mode concentrates on how cohesive textual organisation could be structured. To achieve the objective set out in this study, which is to satisfy learners' needs in organising textual structures and in construing interpersonal aspects of meanings in medical discourse, textual and interpersonal metafunctions are to be approached in the following sections.

2.3 Textual Metafunction

In SFL, types of meanings could be classified into three metafunctions. Among the three metafunctions, textual function is the intrinsic property of a text, which contributes to the organization of discourse and has the enabling power for construction of ideational and interpersonal meanings (extrinsic natures of texts) in context of situation (Halliday, 1978). In this way, texts are organised in unity showing

the features of texture.

2.3.1 Information Structure

In terms of Systemic Functional Linguistics, a very important part of grammar is to make account of the ways of structuring information in people's communication (Bloor and Bloor, 2004). To make descriptive analysis focusing on structures of how clause organises message in text, there are two 'parallel and interrelated' approaches in SFL. One is 'thematic structure' including Theme and Rheme, the other is called 'information structure' involving 'Given and New' elements (Bloor and Bloor, 2004: 65).

With regard to the constituent parts (Given and New) for information structure, Bloor and Bloor conceptualise them in the following:

In order to communicate effectively, the speaker must bring to the hearer's attention some element of shared or 'mutual' knowledge. This shared information is usually found at the beginning of a clause and is labeled Given information. Most clauses also include information that is the focus of the speaker's message, information that is considered New. The two elements together make up an information unit.

(Bloor and Bloor, 2004: 65)

Although 'there is a close semantic relationship between information structure and thematic structure', they are not the same with each belonging to two different systems (Halliday and Matthiessen, 2004: 93). Halliday and Matthiessen characterise that '[thematic structure] is speaker-oriented whereas [information structure] is listener-oriented' (2004: 93).

As for Fries, New can be defined as 'information on which is being presented as "newsworthy" (1994: 233; 2002: 121). Fries also theorises the close relation between thematic structure and information structure as that 'in written language there is a correlation between thematic position and Given information on the one hand and

rhematic position and New information on the other' (Fries, 2002: 125). This two-aspect correlation signals the organising pattern of 'Theme within Given, New within Rheme' (Halliday and Matthiessen, 2004: 93). In particular, Fries follows SFL's term of Theme for Theme/Given pattern, but he adopts a coined term 'N-Rheme' for New/Rheme pattern, indicating the link with 'the goal of the text as a whole' (Fries, 2002: 125, 126).

2.3.2 Cohesion and Coherence

As elaborated in the above section, thematic choices and cohesion are the two linguistic resources for the creation of texture. Thematic choices, as internal resources, comprise the grammatical structures of a coherent text (Halliday, 1994a). On the other hand, however, the construction of a coherent text also needs the external resources to signal the relationships among parts of a text, which are not exclusively structural (Halliday, 1994a). The non-structural external resources for the creation of texture are termed as cohesion (Halliday, 1994a). Thus, cohesion is non-structural text-forming resources, which operates simultaneously with the structural resources to provide texture in texts (Halliday and Hasan, 1976, Hoey, 1991b). Halliday and Hasan (1976) provide an explicit definition of cohesion as: 'the concept of cohesion is a semantic one; it refers to relations of meaning that exist within a text, and that define it as a text' (p4). In this sense, cohesion is a 'textual phenomenon' contributed by 'linguistic devices' (Thompson, 2004: 147).

The realisations of texture by means of thematic structures and cohesion suggest the sensitivity to the context of situation, which indicates the correlation between the dimensions of register and cohesion. On one hand, the realisation of register, as 'the configuration of semantic patterns', is achieved through cohesion in context (Halliday and Hasan, 1976:23). On the other, cohesive features in texts are

commonly specified in 'a consistency of register' (Halliday and Hasan, 1976:23). According to the illustration on cohesion by Halliday and Hasan (1976), there are four types of cohesion: reference, ellipsis and substitution, conjunction and lexical cohesion.

With respect to the concept of coherence, it could be stated that coherence is 'a fundamental trait of discourse', and it is 'a mental phenomenon' (Thompson, 2004: 147), with its definition demonstrating 'the cognitive representation people have or make of a discourse' (Sanders and Sporeen, 1999: 235). Ventola (1999) theorizes coherence as that 'coherence can very briefly be said to be about the relationship the text has to its context of situation' (p105). In terms of roles of cohesion and coherence as well as their relations in contributing to texture, it can be summarised in the following. On one hand, 'cohesion is a textual property and has to do with how the linguistic elements relate by virtue of their lexical or grammatical features', and it is also 'the textualisation of contextual connections', which has to be made 'explicit'. On the other hand, 'coherence is the discourse function of realising those [contextual] connections' (Seidlhofer and Widdowson, 1999: 207).

2.3.3 Theme and Rheme Structure in Text

2.3.3.1 Texture in Text Organisation

Texture within SFL is something which makes a text organized in a coherent way (Webster, 2009), being manifested in its association with the context of situation (Halliday and Hasan, 2012). Within the textual function in SFL, there are two aspects which contribute to texture of texts. One aspect of texture, showing the structural features of texts, is concerned with linguistic choices for thematic structure and information structure in the contextualized frame. Halliday (1994b) relates this aspect of message organization, from the 'speaker's angle', to what the speaker wants to start

from. The other aspect, showing the cohesive features in texts, is concerned with cohesion. Halliday and Halliday and Matthiessen (1994a, 2004) classified these two aspects of texture as follows:

- (A) structural
 - 1.thematic structure: Theme and Rheme
 - 2.information structure and focus: Given and New
 - (B) cohesive
 - 1.reference
 - 2.ellipsis and substitution
 - 3.conjunction
 - 4.lexical cohesion
- (Halliday, 1994a: 334; Halliday and Matthiessen, 2004: 579)

The above illustration suggests that the textual metafunction plays a central role in creating texture, thus contributing to the continuity of text, and the realizations of texture are sensitive to context of situation (Forey and Thompson, 2009). As Halliday (1994b) expounds that it is these textual components which provide the 'texture' of continuous discourse. In order to create texture, these components are used in particular ways that respond to the register being used. Thus, the variation of registers and genres may be reflected by thematic structure and cohesive features in texts with linguistic choices contributing to texture in text. Theme analysis in texts is important in creating 'the flow of discourse', and 'continuity and discursive power', from which much could be revealed about discourse organisation (Halliday, 1994b:146).

2.3.3.2 Concept of Theme/Rheme and their Functions

With regard to SFL, as a basic unit, clause has the character of organising message in all languages. Cummings (1995) echoes that from 'Systemic approach', the concept of Theme/Rheme 'primarily focused on the grammar of the clause' (p276). When the structure in text carries the meaning 'that gives the clause its character as a message', it is referred to as thematic structure (Halliday and Matthiessen, 2004: 64).

Thus, 'the system of Theme belongs to the textual metafunction of the language', with its major concern of 'the organisation of information within individual clauses and, through this, with the organization of the larger text' (Martin *et al*, 2010: 21). More importantly, the feature of clause as message can not only manifest 'some form of organisation' in text, but may 'contribute to the flow of information' (Halliday and Matthiessen, 2004: 64). With respect to the definition of Theme, it is a functional one (Halliday, 1994a; Halliday and Matthiessen, 2004), which means the function of Theme in text has to be taken into account in defining it (Thompson, 2005). Theme is the element organising the clause as message in a structural configuration (Theme and Rheme) (Halliday, 1994a). Halliday (1994a) clarifies this as that 'the theme is the starting-point for the message; it is the ground from which the clause is taking off' (p38).

Martin et al (2010) specify the concept of Theme as such:

The system of Theme organizes the clause to show what its local context is in relation to the general context of the text it serves in; the system is concerned with the current point of departure in relation to what has come before, so that it is clear where the clause is located in the text – how its contribution fits in. This local context or point of departure is called Theme. The rest of the message of the clause is what is presented against the background of the local context – it is where the clause moves after the point of departure. This is called Rheme. The clause as message is thus organised into Theme + Rheme.

(Martin, Matthiessen and Painter, 2010: 21)

In respect to the significance of Theme in discourse organisation, Fries theorises the function of Theme as 'an orienter to the message', which means that Theme 'orients the listener/reader to the message that is about to be perceived and provides a framework for the interpretation of that message' (Fries, 1995: 318). Taking the Theme functioning as an orienter may imply the relationship between 'thematic content within texts' and 'the purposes of the authors and perceptions of the readers', as well as the relation between 'some aspects of information as Theme in text' and

'some aspect of text as a whole' (Fries, 1995: 319). Based on these implications, four hypotheses are provided, among which Theme content may 'correlate with what is perceived to be the method of development of a text' (Fries, 1995: 319). The method of development of the text refers to 'the way in which a text develops its ideas', which could 'affect the reactions of its listeners and readers' (Fries, 1995: 319). As Halliday delineates that Theme carries out the function of 'method of development' in the text, while Rheme performs the function as 'main point' (1994b:146). Highlighting Theme choices through a text in signaling its underlying coherence, Thompson (2004) summarizes four main related functions:

(1) Signaling the maintenance or progression of 'what the text is about' at that point. (2) Specifying or changing framework for the interpretation of the following clause (or clauses). (3) Signaling the boundaries of sections in the text. (4) Signaling what the speaker thinks is a viable/useful/important starting-point.

(Thompson, 2004: 141-142)

With regard to texture through Theme in text, Martin theorizes as follows:

[Considering] texture—to look at the way in which information is distributed in texts and see what sense can be made of the information flow through first position, systemic linguists ... have suggested that information flows through first position in ways that are textually significant; they have found ... that the ways in which information is distributed in a clause is not arbitrarily related to the context of that clause and that first position relates to the context of a clause in systematic ways.

(Martin, 1995: 307)

The analysis in this thesis is based on Halliday's classification of Theme varieties into three broad types: simple Theme (topical), multiple Theme and clause as Theme (Halliday, 1994a). Halliday (1994a) terms simple Theme as follows: 'the Theme of a clause consists of just one structural element, and that that element is represented by just one unit – one nominal group, adverbial group or prepositional phrases' (p39). When the topical Theme is preceded by textual and/or interpersonal Theme, it is

termed multiple Theme (Halliday, 1994a). As noted above, Theme functions as the orientation to the message, guiding readers to understand and interpret the message. Moreover, the content of Theme is closely related to the method of textual development, suggesting writer's relationship with potential readers. In addition, thematic structure in SFL is 'speaker-oriented', while information structure is listener-oriented' (Halliday and Matthiessen, 2004: 93). Concerning PhD candidates' needs as academics in publication, the present investigation is motivated by concentrating on Theme varieties and on the possibility of interpersonal Theme as vehicle for academic voice in medical discourse. From these considerations, analytical framework of Theme/Rheme within SFL is adopted to fulfill the research purpose.

2.3.4 Previous Research on Textual Organisation in Academic Discourse

Before making an account of previous studies on textual organisation in academic discourse, accounts of previous research dealing with other linguistic or rhetorical aspects in academic texts will be started with, from which a clear picture of what scholars have mostly focused on in the past could be elicited. For this purpose, research in the discipline of medical science will not be considered, which are to be dealt with in the following section. In the first place, relevant research concerning with the genre of research articles (RAs) are presented.

With regard to studies on rhetorical structures of RAs, genre analysis for analysing certain sections of RAs in various disciplines could be stated as the most widely adopted approach. Samraj (2002, 2005) and Pho (2008) conducted genre analysis concerning Abstracts of RAs in the domain of conservation biology and in the areas of applied linguistics. As for the Introduction sections of RAs, Kanoksilapatham (2005) examined moves and steps in biochemistry; Ozturk (2007) explored degree of

variability; and del Saz Rubio (2011) performed a pragmatic two-level rhetorical study of constituent moves and steps by focusing on the identification and mapping of the metadiscoursal features. Lim (2006) paid attention to moves in the development of Method section in the field of management. Hopkins and Dudley-Evans (1988); Holmes (1997); Posteguillo (1999); Yang and Allison (2003, 2004) concentrated on Discussion and Conclusion sections in different scientific areas. However, there is none focusing on medical discourse.

Apart from genre studies in RAs, research handling other features in RAs is approached. Gosden (1992) examined theme choices in the area of hard science; while Hyland (2008a) attended to clusters. Martínez, Beck and Panza (2009) performed a corpus-based study of academic vocabulary in agriculture; whereas Teich and Holtz (2009) paid attention to register comparison in colligation in different disciplines. Gray (2010) investigated sentence-initial *this/these* as cohesive devices in the field of education and sociology and Parkinson (2011) conducted clause analysis in physics. It is observed from the above account that genre analysis seems a dominant method in examining the organisation of academic discourse, suggesting singleness in approaches to the studies in this area.

Except for a major research focus on the genre of RAs, Syrquin (2006) explored the ways of register in oral discourse used in academic students' writings.

Studies concerning with cultural factors in academic discourse have been paid more attention than ever before. Pragmatic contrastive studies on RAs mainly involve the following aspects. Giannoni (2002) examined socio-pragmatic construction and textualization of acknowledgements in English and Italian; whereas Martín Martín (2003) and Moreno (2004) respectively explored macrostructure and rhetorical

preferences of using retrospective cohesive mechanisms in English and Spanish. Moreover, Peterlin (2005) concentrated on text-organising metatext in English and Slovene; while Hirano (2009) focused on rhetorical organisation in Brazilian, Portuguese and English. Loi (2010) and Loi and Evans (2010) investigated rhetorical organisation and moves in rhetorical organisation in English and Chinese. These cultural studies on RAs indicate that pragmatic influences arising from different cultural contexts may contribute to variations of message formation in this genre. Although RAs have been studied from these different perspectives, the majority of research mainly focus on one specific aspect of the genre, without any attempts to combine rhetorical structure with interpersonal features as a whole. It is this gap that the thesis tries to fill in to better understand the organisation of RAs.

However, considering the investigations of textual organisation in academic arena from SFL, only a few have been approached. Most of these studies are intended to describe the textual organisations in terms of Theme/Rheme and Given/New information construction. From contrastive rhetoric perspective, Herriman and Aronsson (2009) adopted corpus analysis to compare theme selection and thematic variation in the genre of argumentative writings by Swedish students with those by native speakers. Hasselgård (2009) examined thematic choice and thematised expressions of stance in argumentative essays by Norwegian student learners. In addition, Corbett (2009); Gosden (2009); Montemayor-Borsinger (2009); and Leong (2015) examined different aspects concerning with Theme structures, which involve thematic realisations; thematic content; changes of thematic structure affecting the texture; and patterning of topical themes. Combining framework from critical discourse analysis with SFL model of Theme/Rheme and Given/New, Lassen (2004) concentrated on patterns of Theme/Rheme organisation in biotechnology discourse.

With this apart, Martínez (2003) examined thematic structure in biology, whereas Lorés (2004) explored thematic progression and method of thematic development in linguistics. Crompton (2004) focused on students' argumentative essays to reevaluate Fries' hypotheses of 'thematic progression and 'method of development' to textual phenomena. Finally, Hoey (1991a) notably explored the organization of textual patterns in scientific discourse.

In contrast, studies on medical discourse have been paid less attention to. Among investigations in medical discourse, Atkinson (1992); Thomas and Hawes (1994); Williams (1996); Nwogu (1997); and Skelton (1997) separately explored genre features and registral features; reporting verbs in statements or citations; finite and non-finite instances of lexical verbs; schematic structure; and types of truth. Salager-Meyer paid much attention to the investigations in medical discourse, which involve a diachronic study of RAs academic conflict (1999a); a contrastive study of metaphorical medical terms in medical English with French and Spanish (1999b); a diachronic study of referential behavior (1999c); and a diachronic study of titles in case reports (2013). In addition, Luzón- Marco (2000); Gledhill (2000); Wang and Bai (2007); Chen and Ge (2007) concentrated respectively on a corpus-based study of collocational frameworks of words; collocation of grammatical words; syntactic study of nominal groups; a corpus-based lexical study on word families. With these apart, move structures using hedging and nominalization; most frequently used medical vocabulary; and a diachronic research of the most frequently used verb tenses and the first person pronouns; were conducted by Elmalik and Nesi (2008); Wang *et al* (2008); Li and Ge (2009). Maci (2012) and Saber (2012) paid attention to generic steps for moves from both native and non-native speakers and phraseological patterns. Finally, rhetorical strategies used by American and French scientists during the so-called 'AIDS War' was

performed by Helal (2014).

It is worth mentioning that, among the above-mentioned research on medical RAs and other medical genres, there are only two studies which focused on medical review articles. These two studies on review articles involve handling verb tense and modality in the genres of review articles, case reports and RAs (Salager-Meyer, 1992) and the use of questions in different medical text types such as review articles, editorials, RAs etc (Webber, 1994). In addition, Nwogu (1991) conducted a genre analysis for popular medical articles to characterize the patterns of text organisation in this genre. With regard to the exploration in textual organisation in SFL perspective, according to the best personal knowledge and reference, there are only two relevant investigations. Nwogu and Bloor (1991) focused on thematic progression in professional and popular written medical texts while Mauranen (1996), concerned with learners' ability for discourse construction, extensively and contrastively explored thematic development in journal articles by native and non-native language writers of English as well as native-language writers of Finnish in the fields of medicine and economics.

Based on the above reviews, it could be noted that most explorations on RAs are normally conducted focusing on one single aspect of the linguistic features, either in the discussion of rhetorical structure/textual organisation of this genre, or in the examination of its interpersonal dimensions, with studies seldom integrating both dimensions into a whole. In other words, studies on medical discourse, compared with those on RAs in other academic disciplines, are relatively few. From the perspective of this gap in the existing research, medical discourse is selected as the locus for the thesis, and the focus will be on both textual and interpersonal dimensions. Another reason for the selection of medical discourse, as mentioned in the research context

(introduction) of this thesis, lies in the practical needs of PhD candidates in my university. From these two aspects, two genres of medical discourse, medical RAs and review articles are employed for the investigation. In light of the goal to find practical application from this study, the analysis will be focused on Introduction and Discussion sections for research articles, while for review articles, the beginning and conclusion sections are the focus.

2.4 Interpersonal Resources

Linguistic resources construing for interpersonal aspects of meanings in this study will be carried out within the framework of Systemic Functional Linguistics. In this section, interpersonal metafunction within SFL will be approached firstly, followed by the description of relevant theoretical basis for Appraisal theory. Based on these theoretical backgrounds, an integrated new model of investigating interpersonal aspect of meanings for the thesis will be offered.

2.4.1 Interpersonal Metafunction in SFL

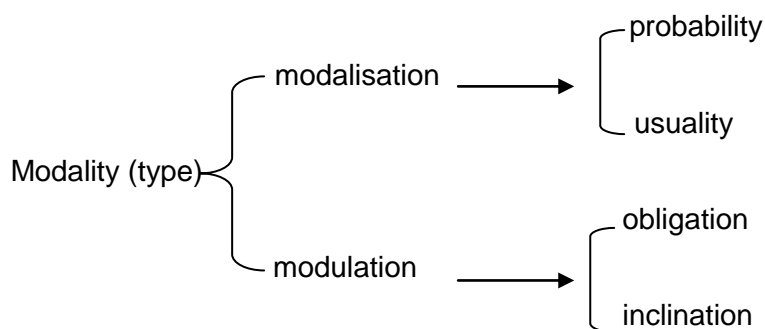
Language is a linguistics system for exchanging meaning. In SFL this communicative feature of 'language as doing something' is theorized in interpersonal metafunction (Halliday, 1978:112). The distinct characteristic of interaction or dialogue nature of clause is specified through interpersonal metafunction. In this two-way communication, linguistic choices are realized in the structures as either statements or questions. Through interpersonal components, the writer or speaker enacts his/her role in social relationships as 'an intruder' into context of situation (Halliday, 1978:112). As an intruder in communicative exchange, the writer/speaker may provide information, 'express his/[her] own attitudes and judgments' (Halliday, 1978:112). Within SFL the interpersonal function of the language is represented through the lexical-grammatical

systems under the headings of mood and modality (Halliday, 1994a).

2.4.1.1 Modality and Intersubjectivity

Within SFL interpersonal metafunction of the clause is specified prominently in the mood structure, which is constituted by the Subject and the Finite (Halliday, 1994a, Thompson, 2004). Halliday (1994b) clarifies: ‘the mood is the element that realizes the selection of mood in the clause’ (p74). Mood plays an important part in the representation of interpersonal meaning. The inherent property for the constituent Finite shows the distinct feature of polarity in either positive or negative expression (Halliday, 1994a). In this respect, ‘polarity is the choice between the positive and negative’ (Halliday, 1994a: 88).

However, in a practical sense, when language is used to construe meaning, linguistic choices are not absolutely restricted to polarity (Halliday, 1994a, Thompson, 2004). Within linguistic systems, there exist intermediate areas between the positive and negative polarity, and that is where modality plays a role (Halliday, 1994a). Halliday (1994a) provides the definition of modality as: ‘modality refers to the area of meaning that lies between yes and no – the intermediate ground between positive and negative polarity’ (p356). There are two types of modality, which Halliday (1994a) categorises as modalisation and modulation. This could be reflected in the following.



(Halliday, 1994a:357)

The grammatical metaphors within the interpersonal dimension in SFL can also be realised in modality, which normally involves the wider range of expression (Halliday, 1994a). Aforementioned delineation indicates that interpersonal components that provides the channel for writers in texts to assess or comment in communication. Thus, the linguistic analysis of modality is in a sense, concerned with the discussion on evaluation. Identifying evaluation as a prominent element within interpersonal metafunction, Thompson (2004) claims that: ‘...evaluation is a central part of the meaning of any text and that analysis of the interpersonal meanings of a text must take it into account’ (p65). For the practical application in this thesis, studies on resources for interpersonal meanings will be performed integrating the functions of modality with Appraisal theory within the framework of SFL. Detailed accounts for Appraisal theory will be provided in the next section.

In terms of intersubjectivity, the emergence of it has a close link with features of modal expressions. The notion of intersubjectivity is raised based on ‘the context of analysis of the modal categories’ and it is ‘intended to account for certain properties of modal expressions’ (Nuyts, 2014: 54). As for the definition of intersubjectivity, Nuyts conceptualizes that ‘a modal evaluation is “intersubjective” if it is presented as being shared between the assessor and a wider group of people, possibly (but not necessarily) including the hearer’ (2014: 58). In practice, the evaluative nature from intersubjectivity will certainly be a discursive part contributing to interaction in text (Nuyts, 2014). Taking a discursal perspective towards intersubjectivity and adopting it as a ‘discourse tool’ (Nuyts, 2014: 58), it means regarding discourse as dialogistic. As Thompson (2014) clarifies:

The discursial perspective [on intersubjectivity] broadly involves viewing discourse as dialogistic: constructed fundamentally in terms of exchanges between interactants in communicative events in which each interactant shapes their message to accommodate and affect the other. Thus, in the most general terms, all discourse can be seen as inherently intersubjective, with specific, identifiable traces of this characteristic.

(Thompson, 2014: 78)

Approaching discourse from 'a dialogistic perspective', it reflects that some 'linguistic resources can be seen as intersubjective', which is quite evident for 'invoked, or implicit evaluation' in text (Thompson, 2014: 79). Invoked, or implicit evaluation refers to the information from the addresser in text which 'is not explicitly marked as evaluative', but it is 'designed to evoke an evaluative response in the addressee'. In this sense, invoked or implicit evaluation may 'create a communicative space for the addressee to collaborate in the construction of the discourse by recognizing and accepting the evaluative potential of the information' (Thompson, 2014: 79). From this point, it could be summarised that evaluative meaning is an essential component of discourse construction, which in a way contributes to interaction in text.

2.4.1.2 Interaction and Evaluation

Based on the aforementioned account, features of interaction are represented through interpersonal meanings. With respect to written discourse analysis, any text could be seen as the site for constructing interaction between writer and reader (Hoey, 2001). As far as discourse and text and their relationship are concerned, discourse is a 'communicative process' and text can be taken as 'linguistic product' of discourse (Widdowson, 1984:100, 2004). In this sense, text is the essential element in the realization of communicative process which is concerned with writer and reader (Nystrand, 1986). The importance of interaction in text analysis is theorized as follows:

We shifted ground and speculated that many of the salient features of written communication lie not in the text *per se* and not in the interaction of reader and text, but rather in the interaction between writer and reader by way of the text. Hence, we began to consider the text less as a focal object of analysis in its own right and more as a subsidiary element in a communicative, interactional process. As a consequence of this shift, our object of analysis became the process of interaction itself.

(Nystrand, 1982: 71)

Thompson and Thetela (1995) generalised two approaches to the studies of interaction in written discourse. One of the approaches, 'information-oriented', is concerned with the ways of text construction with writers' considerations of reader's 'expectations, knowledge, and interests' (p104). Thompson and Thetela (1995) referred to this type of interaction as 'interactive' aspect (p106). The other approach, 'function-oriented', focuses on the ways of writers' establishing interaction with readers by enacting roles and 'intruding in the message', which is termed as 'interactional' aspect (p106). Highlighting the significance of addressing the role of audience in texts, Thompson (2001) conceptualizes the writer's awareness of reader in text as such:

Proficient writers attempt to second-guess the kind of information that readers might want or expect to find out at each point in the unfolding text, and proceed by anticipating their questions about, or reactions to, what is written.

(Thompson, 2001: 58)

From this perspective, text is the product which realizes the communicative process of discourse. However, in discourse not only the communicative features are specified, linguistic representations for evaluation are also embodied in it (Hunston, 1994). More significantly, evaluation plays the central part in contributing to interaction (reader-oriented) in text (Thetela, 1997). Thompson and Hunston (2000) specify the role of evaluation in both establishing interpersonal meaning and creating textual organization. They (2000) elaborate that evaluation (evaluative items) can be employed to build a relationship in which 'an interaction will take place between the writer and

reader keeping track of the progression or organization of the text' (p11). The expression of evaluation in texts reflects the 'shared norms and values' of writers and readers (Hunston, 1994:191). It is the shared norms and values between the both participants that create the interpersonal meaning in texts (Hunston, 1994). In organizing texts, cohesion and coherence can be realised through evaluation. As Thompson and Zhou (2000) argue that 'both coherence and cohesion depend on evaluation – what the writer thinks about what he or she is writing – as well as on the logical connections' (p121). From this perspective, interaction and evaluation is closely related to each other, and are two essential elements in the realization of interpersonal communication in texts.

Throughout the development of theoretical research on evaluative meaning in academic discourse, scholars handle this aspect of interpersonal meaning with different focuses. Thompson and Hunston take evaluation as attitude or stance and specify it that:

Evaluation is the broad cover term for the expression of the speaker or writer's attitude or stance towards, view point on, or feelings about the entities or propositions that he or she is talking about. That attitude may relate to certainty or obligation or desirability or any of a number of other sets of values. When appropriate, we refer specifically to modality as a sub-category of evaluation.

(Thompson and Hunston, 2000: 5)

On the other hand, Conrad and Biber (2000) deals with evaluation by employing the cover term "stance" for the expression of personal feelings and assessments' (p57). The expression of stance involving three major domains, which can be illustrated in the following:

- (1) epistemic stance, commenting on the certainty (or doubt), reliability, or limitations of a proposition, including comments on the source of information;
- (2) attitudinal stance, conveying the speaker's attitudes, feelings, or value judgements;
- (3) style stance, describing the manner in which the information is being presented.

(Conrad and Biber, 2000: 57)

As for Hyland (2004c), he conceptualizes two ways of realizing evaluation in academic text, which involve 'stance (attitudinal dimension)' and 'engagement (alignment dimension)' (p15). Hyland summarises in the following:

If we look closely at evaluation in academic writing we can see writers managing interaction in two ways: (i) they express a voice or personality, an attitudinal dimension I shall call stance and (ii) they relate to their readers, an alignment dimension I shall call engagement.

(Hyland, 2004c: 15)

According to Hyland, stance 'refers to writer-oriented features which express attitudinal and epistemic meanings to manage how writers present a credible academic identity' (2004: 16) whereas engagement is reader-oriented, referring to 'the ways writers bring readers into the discourse' (2004c: 18). As far as stance is concerned, Hyland considers there are three main elements for it. He (Hyland, 2014: 5) specifies the functions of these three components as follows:

Evidentiality, or the writer's expressed commitment to the reliability of propositions and their potential impact on readers;
Affect, or personal and professional attitudes towards what is said;
Presence, or how far writers choose to project themselves into a text.

To put it in brief, there are four main specific ways of expressing stance in academic text, which can be theorized in the following (Hyland, 2004c: 16):

- i Boosters (show definitely) to strengthen claims. These express the writer's judgements of certainty and emphasise the force of statements.
- ii Hedges (might, perhaps) which reduce the force of arguments and criticisms. You take away the hedge and an opinion becomes closer to a fact.
- iii Attitude Markers which express affective meanings such as surprise or disappointment, and judgements of importance, relevance or agreement.
- iv Self-Mention – this refers to how far writers choose to intrude into their texts through use of 'I' or to use impersonal forms.

In comparison with the above views on stance for evaluation, stance can be handled from quite a different way, which involves evaluation, subjectivity and interaction (Englebretson, 2007). In addition, Hyland (2008b) extends his explorations on evaluation through stance and engagement by theorizing metadiscourse and using it as the cover term for 'the self-reflective expressions used to negotiate interactional meanings in a text', and for 'assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community' (p37). Adopting 'Thompson and Thetela's (1995) distinction between interactive and interactional resources' (p48), Hyland's classification of metadiscourse recognizes both 'the organizational and evaluative features of interaction' in text (p49).

2.4.2 Appraisal Theory

According to the above account for relevant view and research on evaluative meaning in academic discourse, it could be illuminated that investigations concerning with this aspect of interpersonal meaning may have sort of their deficiencies. For instance, evaluative language from Thompson and Hunston perspective stresses authorial stance to highlight writer-oriented features in text. On the other hand, Hyland's view on evaluation emphasizes both representation of writer's projection and that of their ideas in text. All these viewpoints towards evaluation highlight the

significance of situation of context, but may neglect the importance and function of intertextuality (co-existed texts) in academic genres. It is for this gap that Appraisal theory will be employed as the theoretical basis for the investigation of this thesis. In this section, some theoretical bases for Appraisal theory within SFL will be manifested and then the main features of this theory are to be presented.

2.4.2.1 Bakhtinian Perspectives of Language and Dialogism

Bakhtin's perspective towards language lies in that all languages are dialogic, situating in social contexts and in the meanwhile echoing every aspects of society. Working from 'Philosophical anthropology' and focusing on literary aspect of language, Bakhtin conceptualizes his idea of language in that he 'insists on locating all utterances, whether spoken or literary, between the participants in a dialogue and thus involves them in considerations of power and authority' (Dentith, 1995: i). In this sense, Bakhtin is known as 'the originator of a polyphonic or dialogic conception of language and culture' (Angermuller *et al*, 2014: 27). From this dialogic perspective, a novel could be regarded as 'a diversity of social speech types and a diversity of individual voices, artistically organized'. In short, any discourse is 'inherently dialogic' (Angermuller *et al*, 2014: 27). Bakhtin's insight of language as dialogic is quite important for the description of linguistic structures. As Chouliaraki and Fairclough theorize as that:

Bakhtin's theory of language is crucial for a move towards a dialectical theory because of the insight it gives into the nature of the process through which discourse is both shaped by language structures yet works them and ultimately transforms them as well as producing them.

(Chouliaraki and Fairclough 1999: 49)

Moreover, dialogism perspective could be a different approach to understanding both language and culture, through which 'meaning is dialogically

viewed as an emergent phenomenon, integrating aspects of both the immediate and historical social contexts of performance' (Bostad *et al*, 2004). In this sense, the principle of dialogism for description of language (or language use) is grounded on the word of 'other-orientation' in discourse (Linell, 1998: 35), which assumes the dialogic structure with active 'responsive understanding' from participants in discourse formulation (Lachmann, 2004). Bakhtin specifies dialogism as follows:

Each utterance is filled with echoes and reverberations of other utterances to which it is related by the community of the sphere of speech communication. Every utterance must be regarded primarily as a response to preceding utterances of the given sphere. Each utterance refutes, affirms, supplements, and relies on the others, presupposes them to be known, and somehow takes them into account. The expression of an utterance always responds to a greater or lesser degree, that is, it expresses the speaker's attitude toward other's utterances and not just his attitude toward the object of his utterance...

(Emerson and Holquist, 1986: 91-92)

Based on the aforementioned account of Bakhtinian perspective of language use, it can be stated that 'dialogism stresses the contextual nature of interaction, and the relevant contexts are not only situational but also sociocultural, i.e. historically constituted' (Linell, 1998: 35). According to Roulet (2011) and Livnat (2012), Bakhtin's dialogism may cover at least four different dimensions in that:

- (i) it refers to the constant interplay between socio-ideological languages in discourse and society – 'dialogized heteroglossia'.
- (ii) it refers to the fact that any discourse is related 'by a thousand dialogical threads' to all existing discourses of the same type on the same subject; this is what we today call intertextuality.
- (iii) it refers to the fact that any discourse, even a monological written text, is reaching to preceding discourses and anticipating further discourses...
- (iv) it may refer to the fact that the discourse of other persons occupies an important place in the discourse, or even in the utterances, of any speaker; this is what we today call polyphony.

(Roulet, 2011: 209)

From this account, it could be summarized that Bakhtin's dialogism is prominently characteristic of heteroglossia, intertextuality, which will be described in the following section.

2.4.2.2 Intertextuality and Heteroglossia

Bakhtinian dialogic perspective of language emphasizes not only 'responding, anticipating and eliciting responses' in discourse, but also discourse intertextuality (Chouliaraki and Fairclough, 1999: 49). The term intertextuality was coined by French scholar Julia Kristeva, which is seen as 'a processual state' reflected in a text (Slembrouck, 2011: 156-157). From this departure point, it could be claimed that any 'given text cooperates not only with its predecessors, but also with its successors in a polyphonic and synchronic enterprise' (Selzer, 1993: 174). In a broad sense, intertextuality can be conceptualized in that 'texts in their entirety are transpositions of other texts and are understood in relation to those others; whether writers and readers are aware of those transposition or not' (Selzer, 1993: 173). It could be argued that each text is 'intertextual' in its individual words with word carrying a history (Selzer, 1993: 173). To put it in a simple way, intertextuality indicates that 'parts of texts become parts of other texts; the information is condensed, reformulated and reshaped to fit the purposes of the author' (Ventola, 1999: 109).

On the other hand, Bakhtinian notion of heteroglossia refers to 'the way that any utterance, in negotiating its relation both to its object and the interlocutor, encounters a myriad socially and historically formed other words which it has to measure itself against' (Dentith, 1995: 195). In this sense, it can be stated that heteroglossia 'denotes the meeting of individual utterances and the broader social context present in every word', which manifests the resemblance of intertextuality to

the Bakhtinian notion of heteroglossia (Selzer, 1993: 173). Bakhtin theorizes the close link between discourse and its social situation of context through heteroglossia in that:

At any given moment, languages of various epochs and periods of socio-ideological life cohabit with each other. At any given moment of its historical existence, language is heteroglot from top to bottom. These 'languages' of heteroglossia requires a methodology very different from the others... in actual fact, however, there does exist a common place that methodologically justifies our juxtaposing them: all languages of heteroglossia, whatever the principle underlying them and making them unique, are specific points of view on the world, forms for conceptualizing the world in words.

(Holquist, 1981: 291-292)

This emphasis on its social context of language lays the foundation for the framework of Appraisal theory, which will be further accounted in the next section.

2.4.2.3 Characteristics of Appraisal Theory

Influenced by 'Bakhtin-inspired view that all verbal communication is dialogic', Appraisal theory developed from within Systemic Functional Linguistics and the main focus of this theory is on the mode of interpersonal meaning within SFL (White, 2008: 568). Notably, Appraisal theory, to a certain extent, extends 'the SFL-model of interpersonal meaning-making', which offers 'more delicate descriptions' of linguistic choices when addressers express and negotiate their evaluative meanings with addressees (White, 2008: 568). As Hood and Martin (2005) elaborate that the fundamental concept of Appraisal theory is 'to shift our gaze from the exchange of goods and services or information, to the negotiation of feeling' (p741). In general, Appraisal theory is mainly concerned with 'the interpersonal in language, with the subjective presence of writers/speakers in texts as they adopt stances towards both the material they present and those with whom they communicate' (Martin and White, 2008: 1). In a specific sense, Martin and White (2008) elaborate in detail major issues for which Appraisal Theory may be taken as a new approach. They specify these issues in

the following:

[Appraisal theory] is concerned with how writers/speakers approve and disapprove, enthuse and abhor, applaud and criticize, and with how they position their readers/listeners to do likewise. It is concerned with constitution by texts of communities of shared feelings and values, and with the linguistic mechanisms for the sharing of emotions, tastes and normative assessments. It is concerned with how writers/speakers construe for themselves particular authorial identities or personae, with how they align or disalign themselves with actual or potential respondents, and with how they construct for their texts an intended or ideal audience.

(Martin and White, 2008: 1)

From this perspective, it could be stated that Appraisal primarily deals with 'evaluation – the kinds of attitudes that are negotiated in a text, the strength of the feelings involved and the ways in which values are sourced and readers aligned' (Martin and Rose, 2014: 25). Within this broad framework, Appraisal system, in the first sense, covers what traditionally have been handled termed as 'affect', 'modality', 'vague or intensified language' (Martin and White, 2008: 2). It could be argued that Appraisal theory may provide an extensive and complete elaboration for interpersonal meanings in discourse.

Secondly, Appraisal takes the dialogic view towards discourse in that any text (even monologic) 'involves the speaker/writer in responding in some way to what has been said before on the subject by others and in anticipating how those addressed will themselves react or respond to what is being asserted' (White, 2008: 568). Thirdly, Appraisal framework highlights Bakhtinian notion of heteroglossia when it deals with the linguistic resources of evaluation and stance focusing on their social function. This social functional view of language means that writers or speakers not only 'express their feelings and take stands', but also 'engage with socially-determined value positions' (White, 2011: 14). Within the social functional context in SFL, Appraisal framework focuses on 'interpersonal functionality' of language, which may assist

'extending descriptions and understanding of those aspects of language' for writers' constructing 'particular identities or personae' and positioning themselves (White, 2011: 14). The current study focuses on PhD candidates' needs in academic writing for publication, suggesting their potential need is to engage with wider academic discourse community. In this sense, Appraisal theory is adopted to serve this purpose.

Appraisal theory is comprised of three interactive dimensions, which involve 'Engagement', 'Attitude' and 'Graduation' (Martin and White, 2008: 35) with Attitude at the heart of the Appraisal system (Hood and Martin, 2005: 741). The resources for the whole Appraisal system can be illustrated in the following figure.

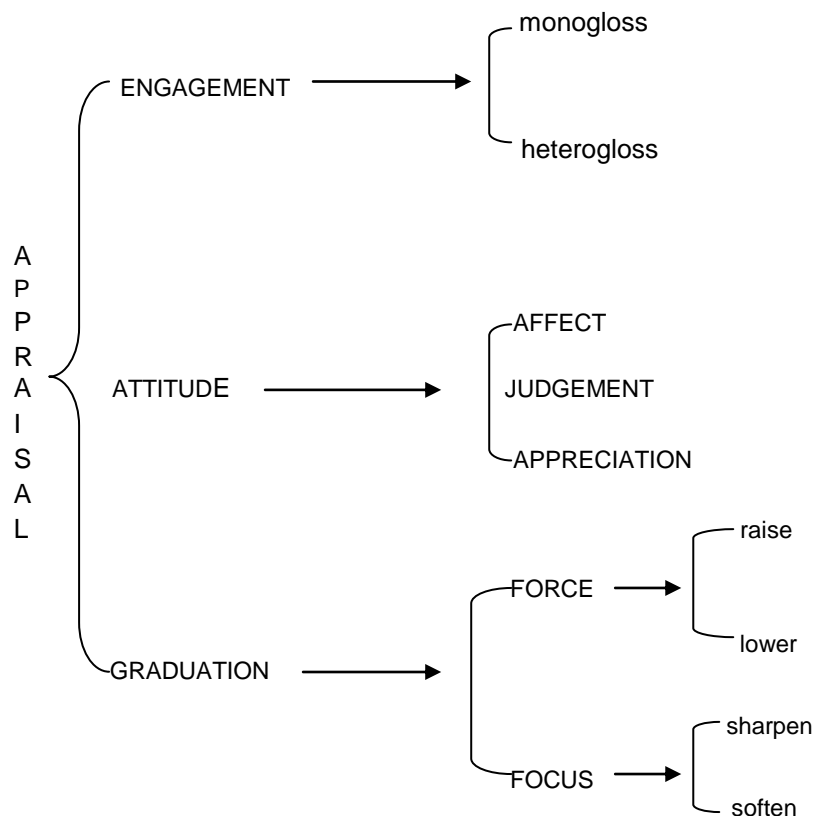


Figure 2.2 (Reproduced from Martin and White, 2008: 38)

As suggested in the introduction of this thesis, in the present situation for EFL in China within the ESP context, it can be observed that language is viewed as an

abstract system with a focus on sentences and grammatical rules. In contrast, SFL takes a functional view of language as discourse. The analysis of discourse or text using a SFL perspective could provide instructors with a basis for instruction, in which linguistic choices would be available to students that they are likely to meet with when they attempt to read and write (Genhard, 2010). It is for these reasons that a SFL orientation is adopted for this research, as it could be of practical values for changes in the traditional customs of teaching with a focus on sentence-based grammar (McCarthy, 1998, 2001).

The study on both textual and interpersonal functions focusing on thematisation and modality combined with Appraisal system, could be a complement to fill in the gap in previous studies on academic discourse, especially in medical field. This study is conducted using a small corpus of medical texts for pedagogical application in accordance with principles within ESP situation described by Hopkins and Dudley-Evans as follows:

...much more [ESP] research needs to be done if teaching materials and classroom methods are really to prepare students for the tasks they need to carry out in English. ESP work needs, in particular, a system of analysis that is able to describe the texts that students have to be able to produce or understand in such a way as to

1. Differentiate between different types of text.
2. Provide useful information about the nature of different types of texts that is of pedagogical value.

(Hopkins and Dudley-Evans, 1988:113)

2.4.3 Previous Research on Interpersonal Features in Academic Discourse

A considerable amount of research contributes to the investigations of interpersonal characteristics in academic discourse. Among the explorations handling interpersonal features in academic discourse, linguistic resources highlighting evaluative meaning of interpersonal aspect in different disciplines have been examined.

Studies in this area involve the following interpersonal aspects: evaluative functions of reporting verbs (Thompson and Ye, 1991); evaluative interaction (Thetela, 1997); aspects of evaluative language and two modes of evaluation (Tucker, 2003, 2004); explicit evaluation and modality (Stotesbury, 2003); adverbial *evidently* as metadiscourse contributing to evaluation (Silver, 2003); academic criticism (Martín-Martín and Burgess, 2004). Apart from these, Hyland (2004a); Webber (2004); Silver and Bondi (2004) respectively examined the key aspect of evaluation (engagement); negation; and the writer's position by different types of voices. In addition, criticism (negative evaluation) and linguistic resources signaling the prominent values were explored by Stotesbury (2006) and Giannoni (2010).

Interaction between addresser and addressee in academic RAs have been extensively investigated. In the first place, imperatives; personal pronouns; impersonal constructions and the first person pronouns; interpersonal metadiscourse revealing writers' identity and mode of interaction were focused on by Swales *et al* (1998); Kou (1999); Martínez (2001, 2005); and Abdi (2002). Moreover, Giltrow (2005); Martínez (2008); Sala (2010); and Warchał (2010) examined deontic modality for obligation of conscientious actions; intertextual dialog; interrogative forms as interactive features; and clause conditionals for interpersonal relations (Warchał, 2010). In addition, citations as authors' affiliation to disciplinary community; first-person pronouns and passive voice in English and Italian; hedges, boosters and attitudinal markers; attitude markers in English and Spanish were attended to by Hewings *et al* (2010); Molino (2010); Gillaerts and Van de Velde (2010); and Mur Dueñas (2010). Apart from these, Dahl (2010); Abdollahzadeh (2011); Hu and Cao (2011); and Kuhl and Behnam (2011) concentrated on author's claims; hedges, emphatics and attitude markers in English and Iranian; the use of hedges and boosters in English and Chinese; shaping of

metadiscourse. Finally, Livnat (2012) conducted a contrastive study of persuasion and dialogicity in Hebrew and English, while Belotti (2010) examined identity in English by NNS Italian writers.

Interpersonal meanings in other academic genres have also been approached. Thompson (2001) analysed interactive and interactional resources for audience awareness in students' essays. Hyland (2003) studied acknowledgements in MA and PhD dissertations indicating academic credibility, recognizing debts and achieving a sense of closure. McCabe (2004) conducted a contrastive study of exploring the relationship between writer and reader through mood and modality in Spanish and English history textbooks. With these apart, Charles (2006) examined the construction of stance in finite reporting that-clauses of students' theses, by using a corpus-based approach; while Aull and Lancaster (2014) handled linguistic markers of stance in students' argumentative essays through boosters, code glosses, and adversative/contrast connectors. As for the academic genre of book review, the following scholars have made attempts for exploring the interpersonal features. Shaw (2004) examined the function of implicit evaluation in economics book reviews while Tse and Hyland (2006) focused on interaction from the metadiscourse perspective in this genre. Moreover, D'Angelo (2010) dealt with gender identity; Babaii (2011) examined criticism (negative comments) and Diani (2014) made a contrastive analysis to examine voices from reviewers and others in academic book reviews. In addition, Kim and Thompson (2010) studied modal expressions of obligation in English and Korean science popularizations. Nelson and Castelló (2012) explored authorial voice in students' essays, which focused on linguistic markers including metadiscourse and self-mention. Luzón (2012) examines evaluation in the specific genre of academic weblogs. Finally, Soler-Monreal and Gil-Salom (2014) conducted a cross-cultural study

for politeness strategies for literature review chapters of PhD theses.

Hyland has conducted many linguistic explorations from different perspectives to reveal interpersonal features of academic texts in different disciplines, which contributes a lot to a fuller understanding of interpersonal features in the genre. As outlined earlier in section 2.1.2, he (Hyland, 2008b) takes a functional view of interaction and identifies both organisational and evaluative features of interaction. Based on this view, Hyland examines varieties of interactional resources in academic discourse under the headings such as: epistemic modality for hedging in EAP and EST textbooks (Hyland, 1994); a close relationship between hedging and social and institutional contexts in RAs (Hyland, 1996a); the importance of hedging for ESP course (Hyland, 1996b); boosting and hedging to indicate doubt and certainty in RAs (Hyland, 1998); citation practices for constructing disciplinary knowledge in RAs (Hyland, 1999); self-mention in RAs for understanding the interaction between writer and reader (Hyland, 2001a); self-mention first-person pronouns in research papers (Hyland, 2002b); stance and engagement for interaction in RAs (Hyland, 2005), and the frequencies, forms and functions of evaluative *that* in RAs Abstracts, MA and doctoral dissertations (Hyland and Tse, 2005). The studies for interactive types of interaction have involved writer's ability of representing themselves and their awareness of addressees in RAs (Hyland, 2001b); directives as an important way of writer's constructing purposes and relationships in RAs, textbooks and L2 writings (Hyland, 2002a); questions underlying the dialogue nature of RAs (Hyland, 2002c); code glosses in metadiscourse for writers' monitoring their texts or offering examples for argument construction (Hyland, 2007); and interaction with the term proximity on reader-oriented view in popular and professional academic texts (Hyland, 2010).

The substantial studies on interpersonality of RAs and other academic genres suggest that scholars have identified the importance of interpersonal features in organizing academic discourse. Writers in academic discourse not only display impersonal scientific facts and knowledge, but also establish effective and close relationships with readers by evaluating and commenting on what they have presented.

Explorations concerning with interpersonal meaning in different medical genres are involved in the following aspects. Salager-Meyer (1992, 1994); Webber (1994); Varttala (1999); Ferguson (2001) and Carter-Thomas and Rowley-Jolivet (2008) examined verb tense and modality as well as hedges; questions; communicative functions of hedging; and if-conditionals. Moreover, academic conflict in Spanish, French and English RAs; synchronic variation of amplifiers; use of metonymy and passive voice; a contrastive study of explicit evaluation in the form of verbal and adjectival evaluative collocates were investigated separately by Salager-Meyer *et al* (2003); Pahta (2006); Rundblad (2007); Bellés-Fortuño and Querol-Julián (2010). Apart from this, Salager-Meyer *et al* (2010); Pérez-Llantada (2010) and Yang *et al* (2015); Giannoni (2011); Salager-Meyer and Alcaraz Ariza (2011); paid attention to acknowledgements indicating intellectual indebtedness; epistemic modality; critical speech acts of impoliteness; and critical voices.

With regard to studies employing Appraisal theory to explore interpersonal resources in academic discourse, the following aspects have been handled. Körner (2000) investigated law judgements combining critical Discourse Analysis with Appraisal theory. Coffin handled voices for negotiation, evaluative meaning in historical discourse through Judgement analysis and Appraisal choices on students' historical writings (2002, 2003, 2006). Koutsantoni (2004) dealt with Appraisal resources such as markers of attitude, certainty and common knowledge in RAs of electronic and

electrical engineering through which RAs authors are positioned interpersonally and intertextually. Moreover, Hood (2004) employed Appraisal system to examine evaluative stance in introductory sections of published RAs and those of undergraduate dissertations in English. By using Appraisal theory, Hood (2006); Mei (2007); Gil-Salom and Soler-Monreal (2010) investigated evaluative stance through Attitude and Graduation; interactive meaning through Engagement; and interpersonal meanings through Engagement system. In addition, authoritative voice through Engagement framework combined with move framework by Swales; Engagement in students' argumentative history writings; patterns of stance in argumentative papers; Appreciation of Attitude and interpersonal meanings in students' argumentative writings by means of Appraisal theory were also focused on by Chang and Schleppegrell (2011); Miller *et al* (2014); Lancaster (2014); and Lee (2008, 2015).

Concerning with Appraisal theory for exploration of interpersonal features in medical discourse, only the following two scholars have made attempts to conduct investigations. Pérez-Llantada Auría (2011) made a cross-cultural investigation of intersubjective stance in biomedical RAs through engagement in appraisal. Fryer (2013) adopted Appraisal framework examining engagement resources in RAs.

Based on the above research reviews, it could be a note that most investigations on academic genres are normally carried out focusing on one single aspect of the linguistic features, either in the discussion of rhetorical structure/textual organization of a genre, or in the examination of its interpersonal dimensions, with studies seldom combining both aspects. In particular, studies focusing on textual organisation and interpersonal features employing Appraisal theory on medical discourse, compared with those on discourse in other academic disciplines, are relatively few. From the perspective of this gap in the existing research, medical

discourse is selected as the locus for the thesis, and the focus will be on both textual and interpersonal dimensions. Another reason for the selection of medical discourse, as mentioned in the research context (introduction) of this thesis, lies in the practical needs of PhD students in a Chinese university. From these departure points, two genres of medical discourse, medical RAs and review articles are employed for the investigation. In light of the goal of illuminating practical applications from this study, the analysis will be focused on Introduction and Discussion sections for research articles, while for review articles, the beginning and conclusion sections are the focus.

2.5 Rationale of Exploring Thematic Organisation and Evaluation

2.5.1 Rationale of SFL Theme-Rheme Structure

Employing Theme/Rheme structure within SFL as the analytical framework in this study has its rationale. In the first place, examining thematic organisation in academic discourse may contribute to the knowledge of textual function as an intrinsic property of texts and its enabling power construing for ideational and interpersonal meanings in context of situation. Martínez (2003) prioritises this feature as that: '[SFL] relates Theme to the other metafunctions (ideational and interpersonal), thus integrating the ways of materialising the three types of meanings in clause initial position' (p109). In addition, explorations on linguistic options for thematic structure in academic writings help us understand how the information structuring could lead to structural texture and coherence in texts. Martínez (2003) summarises: '[SFL] relates Theme to subcategorisations already provided by the theory, particularly the system of conjunction for textual Theme, the system of modality, particularly mood and comment adjuncts, and interpersonal metaphors' (p109).

2.5.2 Rationale of Appraisal Theory for Exploring Evaluative Resources

Concentrating on Engagement and Graduation systems of Appraisal within SFL for the exploration of evaluative resources in this thesis has its rationale. Situating with SFL, Appraisal not only deals with interpersonal meanings, but also takes the priority of handling interpersonal, ideational and textual meanings simultaneously with the significance of a metafunctional perspective offering 'a means of modeling the dynamic construal of evaluative stance across texts' (Hood, 2004: 14-15). Moreover, Appraisal is concerned with 'interpersonal meaning at the level of discourse semantics' in which different linguistic choices in their grammatical structures may contribute to 'a consistent rhetorical effect or evaluative positioning' (Hood, 2004: 14). And more importantly, understanding of meaning construction in a text cannot neglect the 'analysis of the social systems of intertextuality in a community', which is because 'the system of intertextuality provides an interface between language and social semiotics generally' (Lemke, 2002: 32, 37). From this perspective, Appraisal may provide a more comprehensive model for 'systematically modeling evaluative stance' than most other research focus on evaluation.

Equipped with the rationales of employing SFL Theme/Rheme structure and Appraisal theory, this study will concentrate on the investigation of thematic structures and intersubjective positioning in two medical genres. In terms of the association between textual and interpersonal features in academic texts, Gotti (2011) states: 'the close interrelation between epistemological and textual aspects is a common trait of specialized discourse and makes its realizations highly codified...' (p90). This combined exploration attempts to fill the gap in previous examinations in academic discourse. Moreover, concerning with both textual organisation and construal of interpersonal resources in medical discourse at the same time, the present research

could better meet PhD candidates' needs for academic publication. eexploring specialised academic discourse.

2.6 A New Model for Exploring Interpersonal Features

With regard to the theoretical grounds for examining interpersonal evaluative resources for this thesis, analytical frameworks of Engagement and Graduation subsets within Appraisal system will be adopted. Based on sample data analysis, the existing Engagement framework seems to have its limitations and may not uncover the features of intersubjective stances in medical genres. From this perspective, a new model of Engagement framework is proposed to be reestablished, which will be extended with some basics drawing on Appraisal theory (White, 1998; Martin and White, 2008) and the others added parts will follow Lee (2008). Detailed illustration of this new model will be offered in chapter six.

Chapter Three Research Design and Methodology

This study concentrates on the investigation of textual organisation and interpersonal meanings in two genres of medical discourse: medical research articles and medical review articles. Textual organisation is theorised from the perspective of textual texture represented by Theme/Rheme structure and aspects of interpersonal meanings are explored through Engagement and Graduation subcategories within Appraisal system. Details dealing with research design, methodological procedures for selection and construction of corpus data, as well as ethical issues will be delineated in the following sections of this chapter.

3.1 Research Paradigm

3.1.1 A Social Constructivist Theory to Linguistic Analysis

Systemic Functional Linguistics (SFL) takes a social functional view to the study and interpretation of language, which is characterised by 'language in a socio-semiotic perspective' (Halliday, 1978; Halliday and Hasan, 2012: 3). This socio-semiotic model towards language may be reflected in two aspects. In the first place, the model adopts a social perspective to expound 'linguistic phenomena' (Halliday and Hasan, 2012: 4). As Luke highlights that SFL builds 'a recognition of the primacy of the social' since the start of its tradition (1996: x). Secondly, this model tries to 'relate language to a particular aspect of social structure' within social system (Halliday and Hasan, 2012: 4). It can be summarised that language is a social phenomenon and people use language to achieve different social purposes (Bloor and Bloor, 1995). Being a linguistic theory of language as socio-semiotic, SFL represents a social constructivist approach to language which 'interprets and construes human experience' in society (Halliday and Martin, 1996: 8). They go on to argue that:

Language is, as we have tried to suggest, both a part of human history and a realization of it, the means whereby the historical process is construed. This is what we mean by language as social semiotic: while it accommodates endless random variation of a local kind, in its global evolution it cannot be other than a participant in the social process.

(Halliday and Martin, 1996: 18)

Notably, Halliday and Martin takes this socio-semiotic view towards science in that 'modern science is a discourse technology', and 'science is conceived of as a linguistic/semiotic practice which has evolved functionally to do specialized kinds of theoretical and practical work in social institutions' (Luke, 1996: x). Considering the investigation of medical science in this thesis, the social constructivist model of SFL is employed.

3.1.2 Theoretical Foundations

Grounded in the perspective of language as socio-semiotic, SFL is conceptualised through modeling the relationship between language and its social context. This relationship tries to establish language system as the realisation of social context system (Halliday and Martin, 1996). Halliday and Martin (1996) specify this as that 'by realization we mean that one system redounds with the other: language construes, is construed by and reconstrues and is reconstrued by social context' (p24). In SFL the understanding of how language functions in its social context is via the study of texts (Halliday and Hasan, 2012). From the socio-semiotic perspective, text can be referred to as 'an instance of the process and product of social meaning in a particular context of situation' (Halliday and Hasan, 2012: 11). In this sense, text represents a series of options for meaning potential, which is the characteristic of a particular situation type of social context. According to theoretical frameworks of SFL, language is organised into three kinds of meaning in texts by 'adapting to their

contextual categories tenor, field and mode, which can be referred to as 'metafunctions – the interpersonal, the ideational and the textual' (Halliday and Martin, 1996: 29). They go on to depict the correlation between contextual variables and metafunctions as follows:

This metafunctional cross-classification of [language and context] projects linguistic metafunctions onto context in terms of the realizational solidarities of interpersonal meaning with tenor, ideational meaning with field and textual meaning with mode.
(Halliday and Martin, 1996: 29)

Based on the aforementioned discussion on language, text and context in a socio-semiotic perspective, the concept of genre and register indicates a close relationship between each other. On the one hand, it can be simplified to state the contextual variables 'tenor, field and mode constitute the register of a text' (Martin and Rose, 2008: 11). On the other, genre with its potential in a particular contextual of culture 'is the configurations of register variables, the combinations of field, tenor and mode' (Christie and Unsworth, 2000: 12). In sum, 'language is the means by which we "read" both register and genre' (Christie and Unsworth, 2000: 13).

Given the research context for the present study which has been delineated in chapter one, I tend to characterise the meaning construction in the language of medicine. For this purpose, SFL is adopted as the theoretical foundations. To start with, from a social-semiotic view SFL has been a 'tool for participating in political processes' (Halliday and Martin, 1996: 22). In the meanwhile, 'the theory and practice of science and science education have a central place in our political life' (Halliday and Martin, 1996: 22). From this departure point, SFL could be taken as a rationale for exploring medical science to fulfill social political functions within academic community. Moreover, this thesis is initiated by personal teaching experience in a Chinese university. The

main objective of the language instruction is to prepare PhD candidates for their further study and career development in an academic discipline. Thus, it is rudimentary for me to examine the language which is actually used in practice (Young, 1990). In addition, candidates assisted by directed teaching arrangements focusing on 'meaning and function' (Young, 1990: 1) could be equipped with employing language in real academic life and social situations. The close relations between language and context in SFL can make it possible to achieve this pedagogical aim. Finally, the current research focus on an exploration of meanings and functions of language within a social context may better meet the needs of language learners and contribute to the effectiveness in language teaching.

3.1.3 Mixed Research Methods

The research method for this study is mainly a qualitative, but combined with a quantitative. In the first sense, this thesis is based on a small number of medical research articles and review articles to explore the prominent patterns for textual organisation and construal of interpersonal meanings in these two genres. In this respect, it is a qualitative research. On the other hand, popular patterns are elicited and brought about according to the statistical counting of their occurrence and frequency in texts. In this sense, it is also a quantitative study. Hashemi (2012) comments on the mixed methods as 'a useful tool for exploring complex systems, investigating both the processes and the outcomes' (p207). In effect, employing both qualitative and quantitative methods in a research design 'would provide a more complete picture of the phenomenon under study' (Hashemi, 2012: 207).

In their recent study on mixed methods concerning applied linguistics research, Hashemi and Babaii present their argument on the advantage of employing

qualitative and quantitative approaches. They state that:

In fact, experts in research methodology increasingly believe that qualitative and quantitative methods can coexist in a dialectical relationship and that findings from the two strands, being convergent or divergent, enhance the understanding of the phenomenon under study. In reverse, absent one or the other, many questions would remain only partially answered or even wholly unanswered.

(Hashemi and Babaii, 2013: 829)

Based on the above account, the methodological approach is designed for a combination of a qualitative with quantitative method. The mixed method may guarantee the validity for the examination processes and research results.

3.2 Methodology

3.2.1 Steps for Data Collection

3.2.1.1 Choosing Disciplinary Specialties within the Field of Medicine

As aforementioned, the study for this thesis is motivated from personal teaching experience in a medical university in China. The first step for collecting data is to determine the two relevant academic specialties within the medical domain. This is due to the situation that around fifty candidates each academic year enroll in the PhD programme pursuing their research degrees. Among these enrolled candidates in the university, there could be more than 20 different research branches in medical field. Confronted with such a reality, I cannot make use of all the students' draft writings with different research orientations, which may contribute to the invalidity of the study. From this departure point, two related disciplinary specialties in medicine have been chosen for the research foci, which involve Physiology and Cardiology. Physiology is mainly dealing with theoretical studies about the mechanism and functions of living organisms,

while Cardiology concentrates on empirical and experimental research handling clinical treatments of heart-related disorders. Choosing 'similar subject matter' for the thesis suggests a certain degree of rationality, and it may constitute subject 'pairs' proposed by Varttala (1999:182). Varttala (1999) specifies the appropriateness for this type of disciplinary selection as that 'I regard such pairing as appropriate so as to include similar subject areas within the corpus and thus to account for the potential variation among various branches of medicine' (p182).

3.2.1.2 Quantity of Medical Texts

The amount distribution of the total twenty-two medical texts from medical research articles (RAs) and review articles could refer to Table 3.1. Among the twenty-two medical texts, the collection of eleven students' draft writings in Physiology and Cardiology has been lasting for about two and half years. This is mainly because of the limited number of admitted PhD candidates focusing on Physiology and Cardiology each year in the university. As for the two genres of medical texts, it is optional for candidates to write according to the university's publishing requirements for graduation.

In determining the word number of medical texts for this research (which is not a corpus-based but a primarily qualitative), it was conducted manually using the copied downloaded texts. Although the length for each medical research article may vary from journal to journal, the average length for a published medical RA is approximately 8,000-10,000 words, while a medical review article, normally has the shorter average length of 5,000-6,000 words. The published medical texts (11 medical RAs and medical review articles) amounts to around 73, 000-90, 000 words. The L2 students' RAs and review articles is at the similar word totaling to those published ones, since the requirement for those students' texts is to write with reference to the average

length of published articles in international journals.

Table 3.1 Quantity of Published and Students' Medical texts

	Published RAs	Students' RAs	Published Reviews	Students' Reviews
Quantity	6	6	5	5

3.2.1.3 Text Selection and Source Journals

The current study is designed to offer assistance for PhD candidates to handle difficulties in the writing process for publication. From this perspective, students' draft writings were collected in the first place. With regard to the selection of published professional texts, it followed the principle that all published texts must have the high-degree relevance in their topics to those in students' draft ones. Considering source journals, they were chosen through two channels (Mei, 2007). Firstly, source journals for Physiology and Cardiology were decided based on the references in students' draft writings. The source journals were finally selected by consulting medical specialist informants, whose recommendations, to some extent, correspond to the references in students' draft writings. Based on the choosing methods, all these selected journals for published medical texts are considered showing high criterion international journals. In terms of specific features in medical research, the issues of these chosen journals range around between 2005 and 2015. Details for the source journals are provided in Appendix V.

3.2.1.4 Construction of Corpus Data

This thesis aims at linguistic analysis for textual organisation and realisation of interpersonal meanings in two genres of medical texts. Thus, it is necessary to construct a corpus. As Reppen (2010) claims that 'a corpus can serve as a useful tool

for discovering many aspects of language use and is essential when exploring issues or questions related to language use' (p31). When constructing a corpus, four basics in text selection needs to be identified, which is associated with corpus representation concerning a suitable size, a match, reputation and accessibility (Reppen, 2010). First of all, 'a corpus must be representative of the language being investigated' (Reppen, 2010: 31). From this point, it could be stated that all the published medical texts selected from the source journals can 'ensure a representative sample of the language of members of the medical profession' (Nwogu, 1997: 121) and can establish a match 'between the language being examined and the type of material being collected' (Reppen, 2010: 31). As for reputation, the source journals were selected based on the recommendations by medical specialists and students' references, which guarantee the reputation of the corpus. The journal selection method is in agreement with Nwogu's description of reputation as 'the esteem which members of an assumed readership hold for a particular publication or group of publications' (1997:121). Finally, all the published texts are downloaded with ease from the website, indicating the accessibility. It needs pointing that corpus constructing for this study makes no distinction between native and non-native writers of English because 'the target community' for medical practitioners 'is an international one, most members of which are not native-speakers' (Parkinson, 2011: 164).

3.2.2. Procedures for Linguistic Analysis

The contrastive analysis for medical RAs and reviews will be performed, for which two sections were selected for the comparison of their textual and interpersonal aspects. The choice of focusing on the Introduction (the Beginning section for Review) and the Discussion (the Concluding section for Review) is based on the difficulties PhD candidates are faced during their writing process. The emergence of these difficulties

may be caused by linguistic choices in the two different sections and by PhD candidates' language proficiency since they are non-native speakers (NNS) whose native language is Chinese (Martínez, 2003). With the initiative for the study in mind, the exploration for textual organisation and construal of interpersonal meaning are approached with published professional texts as the starting point. It is followed by the linguistic analysis for students' draft ones. If a separate Conclusions/Summary section is present in published professional RAs, for the purpose of analysis this was counted with the Discussion section which in any case frequently carries concluding remarks.

3.2.3. Tables and Coding for Examples

Given the descriptive tables used in this thesis, the grey and yellow shades in the respective column represent contrastive differences between the corresponding sections of published professional and student's draft RAs/reviews. Considering the examples used, two relevant medical areas of physiology and cardiology will be marked as '*Physio*' and '*Cardio*' while a capitalised letter at the end of each example in bracket indicates that the original source is from Introduction//Beginning section (labeled as '*I*' or '*B*') and Discussion/Concluding section (labeled as '*D*' or '*C*'). Abbreviated expressions like 'the Published' and 'the Students' in brackets at the end of sample sentences represent the original sources of examples are from either published professional medical texts or from the students' draft ones. For example,

<i>Physio</i>	The state of phosphorylation of tau is regulated by the function of protein kinases as well as of protein phosphatases PP2A ^[6] . (<i>I</i>) (the Students')
<i>Cardio</i>	CRP-opsonized native LDL is incorporated via CD32 receptor in macrophages and contributes to foam cell formation. (<i>D</i>) (the Published)

Coding for the five subsystems of Engagement will adopt respectively the following coloured parts.

Coding for Monoglossic Bare Assertions: **dark blue**

Coding for Heteroglossic Contraction

Disclaiming Denial: **red**

Countering: **Orange**

Proclaiming Concurrence: **red**

Pronouncement: **light blue**

Causal relations: **olive green**

Endorsement: **brown**

Coding for Heteroglossic Expansion

Entertain Deductive formulations: **navy**

Modalisation: **green**

Modulation: **purple**

Attribute Citations/quotations: **dark red**

Coding for two types of Graduation follows that:

Coding for signaling force intensification: **green**

Coding for force quantification: **bold brown**

Coding for focus sharpening: **red**

Coding for signaling softening: **blue**

3.2.4 Ethical Issues

In terms of collecting students' draft writings, a written consent form was prepared to obtain students' approval. To get the consent form signed, I have sent students e-mails in advance to explain specific aspects concerning the study in details. And then phone calls were made and e-mails sent to make appointments for signing the form. The published professional medical texts are collected without much ethical considerations since they are public.

Chapter Four Thematic Organisation in Medical Research Articles

In this chapter, patterns of thematic choices in the genre of medical research articles (RAs) will be approached and characterised. The exploration will follow theoretical frameworks of Systemic Functional Linguistics (SFL) concerning Theme-Rheme structure. Frameworks for modeling types of thematic structures will be delineated, on which characteristics of textual organisation in published professional and students' draft medical RAs are displayed.

4.1 Analytical Frameworks for Thematic Structure

4.1.1 Types of Theme

From the perspective of mood in a clause within SFL, choices for thematic structure involve Theme in declarative, interrogative and imperative clauses (Halliday and Matthiessen, 2004). In terms of metafunctional configuration for meaning making within SFL, there are three basic components realising for Theme in clause: ideational (topical), textual and interpersonal (Halliday and Mattiessen, 2004).

The investigation of Theme/Rheme structure in this study will follow the categorisation of Theme within SFL as three types: Simple (topical) Theme, Multiple Theme and Clauses as Theme (Halliday, 1994a; Halliday and Matthiessen, 2004). Based on the data for the present study, thematic analysis will concentrate on Simple (topical) Theme in declarative clauses; multiple Theme through textual and interpersonal components as well as some particular thematic structures.

Given the particular feature of three contextualised metafunctions for clauses in SFL, Martin *et al* use the word ‘phase’ to describe the three types of Theme for information development in a clause (Martin, Matthiessen and Painter, 2010: 22). From the metafunctional perspectives, ‘the Theme of a clause can thus have textual, interpersonal, and ideational (topical) phases’ (Martin, Matthiessen and Painter, 2010: 22). The three phases of Theme in a clause could be reflected in the following Figure.

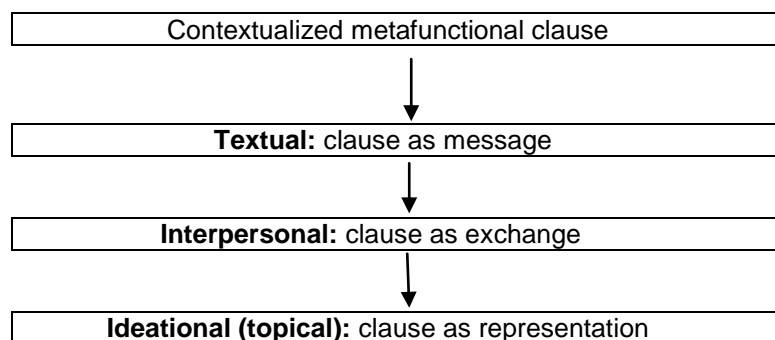


Figure 4.1 Metafunctional Phases of Theme in a Clause

(Reproduced from Martin, Matthiessen and Painter, 2010: 23)

There are two types of **topical** Theme in a clause. If the choice for ‘representational’ meaning expressed in the first element of a declarative clause is the Subject of the clause, the Theme choice is ‘a neutral or unmarked one, which gives the Theme no special prominence’ (Martin, Matthiessen and Painter, 2010: 24). On the other hand, the token of ‘marked’ Theme is given to the topical Theme, if this topical Theme in a declarative clause is not the Subject, which may have ‘a greater textual prominence’ and is quite ‘important in the structuring of large discourse’ (Martin, Matthiessen and Painter, 2010: 24). Examples of unmarked and marked topical Themes (the underlined parts) are presented as follows (Martin, Matthiessen and Painter, 2010: 24).

4.1. The house was gloomy and uninviting.

(unmarked Theme)

4.2. In 1876, Shaw joined his mother and sister in London.

(marked Theme)

As aforementioned in literature review of chapter two of this thesis, thematic analysis in this study will embody the representational functions realised by Theme throughout texts (Thompson, 2004). In addition, textual resources for Theme choices could be used to construct texture in different genres of text. More significantly, the linguistic system within SFL is comprised of three types of functions/meanings, and these types of meanings operate simultaneously with each other in the system. It is for these considerations that the other main focus of thematic choices in medical genres will be on **textual** and **interpersonal Theme** (Multiple Theme). In this way, the analysis for thematic structures in medical genres may further reveal the features of textual organisation.

Halliday (1994a) specifies textual Theme as that '[it] is any combination of continuative and structural and conjunctive' (p53). Textual Themes are classified into three types: continuative Theme, structural Theme, and conjunctive Theme (Halliday, 1994a). These types of Themes are delineated specifically as that:

A continuative is one of a small set of discourse signallers, *yes, no, well, oh, now*, which signal that a new move is beginning: a response in dialogue, or a move to the next point if the same speaker is continuing. A structural Theme is any of the obligatorily thematic elements, conjunctions and WH-relative. A conjunctive Theme is one of the conjunctive Adjuncts, wherever such an Adjunct occurs preceding the topical Theme.

(Halliday, 1994: 53)

Considering Thematic analysis for this study, continuatives are ignored, since this type of textual Theme commonly occurs in spoken discourse. In this sense, textual

Theme characterised through structural conjunction and conjunctive adjunct are concentrated on in this thesis. On one hand, textual Theme may be a textual conjunctive Adjunct realised by an item such as: *therefore, furthermore, finally, in conclusion, for example, however, nevertheless* (Martin, Matthiessen and Painter, 2010). On the other, structural conjunction used as textual Theme could involve: *and, but, although, since, unless, because, until, if, when, whether* (Martin, Matthiessen and Painter, 2010).

Examples of ***conjunction as textual Theme*** (the underlined parts) are listed as follows (Thompson, 2004: 137).

4.3. But the course doesn't start till next week.
(textual Theme)

4.4. And he was right.
(textual Theme)

Interpersonal Theme can be categorised into vocative Theme, modal Theme, and mood-making Theme (Halliday, 1994a). Halliday (1994a) theorises these types of Theme as follows:

A vocative is any item, typically (but not necessarily) a personal name, used to address; it may come more or less anywhere in the clause, and is thematic if preceding the topical Theme. A modal Theme is any of the modal Adjuncts, whenever it occurs preceding the topical Theme. A mood-making Theme is a Finite verbal operator, if preceding the topical Theme; or a WH-interrogative (or imperative *let's*) when not preceded by another experiential Theme (functionally as topical Theme).

(Halliday, 1994a: 53-54)

The above three categories could be specified into the following types (Bloor and Coulthard, 2004: 11): (1) a direct address term such as someone's name or some substitute such as *sweetie, mate, madam, doctor, professor*, used when addressing the

person in question; (2) an Adjunct that expresses a personal comment on the proposition, for example: *to tell the truth, frankly, fortunately, absurdly, ideally, preferably*, and so on; (3) an Adjunct that expresses a degree of certainty about the proposition or its frequency: *maybe, perhaps, probably, certainly, clearly, obviously, seldom, often, frequently, in my opinion, to some extent, in a way*; (4) words like *yes, no, hey, excuse me, sorry*; (5) a Finite preceding the Subject in an interrogative.

Analysis of interpersonal Theme in this thesis will follow the above categorisation and description by Bloor and Coulthard (2004). Considering the data for the thesis, thematic analysis will not involve the first and the fourth types of their classification since these two types represent typical features of spoken discourse.

Examples of **interpersonal Theme** by an Adjunct expressing personal attitudes (the underlined parts) are shown in the following (Thompson, 2004: 137).

4.5. Unfortunately, the 'Un-artist' proliferated within the art.
(interpersonal Theme)

4.6. Not surprisingly, its operations were viewed with admiration.
(interpersonal Theme)

4.1.2 Thematised Comment

Apart from the aforementioned three types of Themes, this study will also concentrate on another particular manifestation of thematic structure, which occurs frequently in some discourse and is referred to as 'thematised comment' (Thompson, 2004: 129). Thematised comment normally involves writers' evaluative stance towards what is about to state in texts. As Thompson (2004) specifies that this type of thematic structure may 'allow speakers to thematise their own comment on the value or validity of what they are about to say' (p129). Thematised comment is normally structured with

subject *it*. In this thesis, the analysis for thematised comment will incorporate not only the representing structures involving writer/speaker's comments towards what they are to state, but also those statements presenting types of reporting or displaying what previous scientists have achieved in a certain academic area. Examples of thematised comment that will be examined in this study are represented as follows.

4.7. It is difficult	to know exactly how to characterise what we have just noticed.
Theme	Rheme
(Thompson, 2004: 129)	
4.8. It was found	that cardiomyocyte injury induced by I/R or H/R may be attenuated significantly by pretreatment with gAd.
Theme	Rheme
(Data for this study)	

4.2 Thematic Structures in the Introductions of Medical RAs

Table 4.1 Frequent Theme Types in the Introductions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Unmarked Theme	102	54.84	155	61.02
Marked Theme	24	12.90	17	6.69
Textual Theme	51	27.42	70	27.56
Interpersonal Theme	2	1.08	---	---
Existential 'There'	3	1.61	2	0.79
Thematised comment	4	2.15	10	3.94

This section will start with examining the patterns of thematic structure in the Introductions of both published professional and students' draft medical RAs. The

characteristics and distribution of popular thematic organisational patterns in the sections are summarised in Table 4.1.

Table 4.1 demonstrates the types of thematic choices frequently adopted by medical professionals and students in the beginning sections of medical RAs. It could be seen that the most dominant cases of thematic structures in the Introductions are unmarked Theme, textual Theme and marked Theme. Both medical professionals and students use a quite similar proportion of textual Theme and existential 'There' as Theme in the introduction sections of their RAs. It is possible to characterise that both professionals and students give priority to unmarked, marked and textual Themes in structuring textual interaction with academic community in the Introductions. In contributing to this textual effect, both of them are inclined to employ a similar proportion of textual linkers. Interpersonal Theme is present in a lower frequency in the sections of published professional RAs, whereas it is absent in the students' draft ones.

However, the large difference lies in that professionals pay more attention to 'textual prominence' through a higher frequency of marked Themes in the sections (Martin et al, 2010: 24). In comparison, students show the preference of using more unmarked Themes and comments in thematic position.

4.2.1. Patterns of Unmarked Theme

Given subject heads of unmarked Themes, eight categories of them will be examined in this study which could be represented in Table 4.2. It is necessary to delineate types of subject heads before analysing thematic patterns. In the first place, 'referred authors' could be taken as 'cited authors', indicating those quoted writers of research papers when reviewing relevant literature in the Introductions. On the other

hand, the category of ‘authors’ is used to refer to the pronouns such as first person pronouns like *we* or *I*. Unmarked Themes realised by ‘referred studies’ is a type of citation or reference to previous relevant academic investigations.

Table 4.2 Cases of Subjects as Unmarked Themes in the Introductions of Medical RAs

Types of Theme	the Published (6)		the Students’ (6)	
	<i>n</i>	%	<i>n</i>	%
Research-oriented objects	53	42.4	102	65.81
Referred authors	1	0.8	6	3.87
Authors	2	1.6	2	1.29
Existential ‘There’	3	2.4	2	1.29
Referred studies	19	15.2	14	9.03
Research purpose	---	---	1	0.65
Reference	1	0.8	1	0.65
Epistemic nouns	46	36.8	27	17.42

As indicated in Table 4.2, both professionals and students depend heavily on ‘research-oriented objects’, ‘epistemic nouns’ and ‘referred studies’ as the most frequent subject heads of unmarked Themes in the Introductions of their RAs. However, professionals tend to employ more ‘epistemic nouns’ and ‘referred studies’ as heads for unmarked Themes, whereas students are inclined to adopt a lot more ‘research-oriented objects’ as subjects of unmarked Themes in the sections. It is noted that students employ higher frequency of ‘referred authors’ as subjects of unmarked Themes than professionals in the Introduction sections.

4.2.1.1 Research-oriented Objects as Unmarked Themes

Table 4.2 demonstrates that the dominant pattern of unmarked Themes in the beginning sections of published professional and students' draft medical RAs can be signified by the higher frequency of 'research-oriented objects' as subject heads. The frequent cases of subject heads for this type of unmarked Themes (with a minimum of two presences) are reflected in Table 4.3.

Table 4.3 Frequent Cases of Research-oriented Objects as Unmarked Theme in the Introductions of Medical RAs

The Published	The Students'
Alzheimer's disease (AD), atypical antipsychotic drugs, Ca ²⁺ /calmodulin-dependent protein kinase II (CaMKII) and protein kinase C (PKC), neonatal ventral hippocampus (NVH)-lesioned rats, okadaic acid (OKA), risperidone, Adiponectin (APN), serum C-reactive protein (CRP), ischemia/reperfusion (I/R) injury	Alzheimer Disease (AD), amyloid beta protein (A β), A β 31-35, Calcium/calmodulin-dependent protein kinase II (CaMKII), Humanin (HN), [Gly14]-Humanin (HNG), hyperphosphorylated tau, long-term potentiation (LTP), signal transducer and activator of transcriptions (STATs), adiponectin, Akt, anesthetic preconditioning (APC), elevated levels of C-Reactive Protein (CRP), endoplasmic reticulum (ER), ER stress

Examining 'research-oriented objects' as unmarked Themes in the Introductions of medical RAs, it is found that 'research-oriented objects' in thematic position is, to a large extent, realised by nominalisations. More significantly, nominalised unmarked Theme is frequently accompanied by passive voice. 'Research-oriented objects' as grammatical subjects of unmarked Themes combined with the employment of passive voice, could be viewed as an impersonal way for medical professionals and students to interact with potential audience about the progression

and development of scientific research within a certain academic area. In most cases, professionals and students employ nominalisations as research-oriented objects of unmarked Themes in establishing textual interaction with the external world in the Introductions. These features can be shown in the following examples (the bold blue parts for research-oriented unmarked Themes and underlined parts indicating passive voices).

Physio 4.1 **Risperidone** and other **atypical antipsychotic drugs** including dozapine have been used to reverse positive and negative symptoms of schizophrenic psychosis. (I) (the Published)

Cardio 4.1 **Anesthetic preconditioning (APC)** has been shown to reduce infarct size, and attenuate contractile dysfunction and serum CK-MB concentration caused by myocardial ischemia. (I) (the Students')

Occasionally, professionals may use nominalisation of a research-oriented unmarked Theme in joint with a textual Theme. In such a way, they attempt to specify the research context in establishing the further coherent interaction with readers. This pattern could be represented (textual Theme by the bold green parts) as in:

Physio 4.2 **Neonatal ventral hippocampus (NVH)-lesioned rats, in which** the ventral hippocampal region is lesioned by injection of excitotoxic ibotenic acid on postnatal day (PD) seven, have been proposed as an animal model of schizophrenia. (I) (the Published)

4.2.1.2 Epistemic Nouns of Unmarked Themes

Another dominant case of unmarked Theme adopted by both professionals and students in the Introductions is construed through subject heads of epistemic nouns. The presence of this type of unmarked Theme in the RA genre might indicate some abstractions and generalisations of scientific investigations in a medical domain. The most frequent epistemic nouns (with a minimum of two occurrences) in the Introduction sections of published professional medical RAs involve the following

aspects:

activation, activity, changes, evidence, loss, observation, study, treatment

On other hand, epistemic nouns frequently (with a minimum of twice) employed by students in their draft RAs are listed in the following:

evidence, experiments, findings, hallmarks, mechanisms, phenomenon, pretreatment, researches, results, role, study, studies

When professionals and students review relevant literature in the Introductions, epistemic nouns as heads of unmarked Themes are normally infused with verbs indicating a relational process. Combination in this way may represent the abstracting feature of scientific fact in academic genre. This pattern could be exemplified as follows (the bold red parts for epistemic unmarked Themes, textual Themes by the bold green parts and the underlined part for the relational process).

Physio 4.3 One of the characteristic **changes** **that** occur in Alzheimer disease **is the** loss of acetylcholinestrace from both cholinergic and non cholinergic neurons in the brain. (I) (the Published)

Under many circumstances, related literature reviews can be generalised through epistemic nouns of unmarked Themes tailed by material processes either in active or passive voice (using verbs such as *observe, show, play, achieve, result* and *investigate*). Literature review presented in such a way might reflect what the previous investigations have achieved. The following instances may typify the characteristic pattern (material processes by underlined parts).

- Physio 4.4** **Loss** of cholinergic neurons in the brain and reduced cholinergic activity in the hippocampus and a cortical **loss** of choline acetyltransferase were also observed in Alzheimer disease. (I) (the Published)
- Physio 4.5** **Experiments** using transgenic mouse models and gene targeting have shown a close association between impaired hippocampal LTP and behavioral learning and memory deficits. (I) (the Students')
- Physio 4.6** Several lines of **evidence** have also suggested **that activation** of $\alpha 7$ -nicotinic acetylcholine receptor subunits plays an important role in the maintenance of cognitive functions in neurodegenerative disorders like Alzheimer disease. (I) (the Published)
- Cardio 4.2** This **phenomenon** is achieved by several pharmacological agents, including volatile anesthetics. (I) (the Students')
- Physio 4.7** **For example, pretreatment** with A β 31-35 and A β 25-35 only 4 hours resulted in apoptosis of cultured cortical neurons^[2]. (I) (the Students')
- Cardio 4.3** **However,** the **role** of ALDH2 in isoflurane-induced APC has not been investigated. (I) (the Students')

4.2.1.3 Referred Studies in Thematic Position

Apart from the dominance of 'research-oriented objects' and 'epistemic nouns' as unmarked Themes in the Introductions, unmarked Themes in the RA genre could be realised frequently through referring to relevant studies in a certain area of medicine. In most cases, this type of unmarked Theme is materialised by varieties of epistemic nouns combined with material processes. Epistemic nouns as referred studies of unmarked Themes used by professionals and students are signified as follows:

drugs, effects, evaluations, evidence, experiments, observations, research, trials, treatment

As for professionals, they are inclined to make reference to relevant scientific research through epistemic nouns accompanied by either relational or material

processes in the Introductions. Unmarked topical Themes construed by means of referred studies are likely to be a point of departure for reviewing related literature in a more objective and convincing way. On one aspect, professionals may contribute to objectivity by reference to relevant studies infused with a material process through passive voice (verb like *observe*). For example (the bold purple parts for referred studies and the underlined part for passive voice),

Cardio 4.4 Similar cardioprotective **effects** by propofol have also been observed in some animal and clinical studies (Javadov et al., 2000; Kobayashi et al., 2008; Searle and Sahab, 1993; Xia et al., 2003). (I) (the Published)

On the other aspect, professionals could resort to the pattern of epistemic nouns as 'referred studies' of unmarked Theme accompanied by a material process with active voice (*promote, enhance and exacerbate*) in the sections. In this way, they try to emphasise the possible impacts of refereed studies on their scientific investigation. Example **Physio 4.8** may signify this type of pattern (textual Theme by the bold green part and the underlined part for active voice).

Physio 4.8 **Treatment** of rodents or humans with N-methyl-D-aspartate (NMDA) receptor antagonists such as MK-801, phencyclidine (PCP) or ketamine promotes cognitive impairment and enhances positive and negative symptoms (Krystal et al., 1994; Lisman et al., 2008); **and** these **drugs** also reportedly exacerbate symptoms in patients with schizophrenia (Steinpreis, 1996; Jentsch and Roth, 1999). (I) (the Published)

To state the possible research orientation for their own research, professionals could pattern epistemic nouns of unmarked Themes with relational processes. This may be exemplified as follows (relational process by the underlined part).

Cardio 4.5 Recent pathological, physiological, angiographic, and intravascular ultrasound **evaluations** are remarkably concordant in identifying multicentric vascular inflammatory processes as major cause for the pathogenesis of atherothrombotic events [2]. (1) (the Published)

In most cases, professionals may employ some 'research-oriented objects' as referred studies of unmarked Themes in the Introductions. Referred studies realised in this way involve *APN*, *caspase-12*, *endoplasmic reticulum stress*, and *tissue*. This type of unmarked Theme is usually combined with material processes through passive voice (verbs such as *find*, *propose*, and *show*) or a relational process. These patterns, could establish relevance between referred studies and the prepared research in literature reviews. For instance (underlined parts for material and the relational processes),

Cardio 4.6 **APN** has recently been found to have cardioprotective activities¹³. (1) (the Published)

Cardio 4.7 **Caspase-12** is an initiator caspase and has been proposed to be a key mediator of ER stress-induced apoptosis^{31,32}. (1) (the Published)

Cardio 4.8 **Moreover**, atherosclerotic and aneurismal **tissue** has been shown to synthesize CRP [6, 9,15]. (1) (the Published)

In contrast, students adopt only one pattern for referred studies of unmarked Themes. In this pattern, epistemic nouns as referred studies of unmarked Theme are followed by material processes through active voice (verbs like *reveal*). This could be characterised as follows (the underlined part for active voice).

Cardio 4.9 Clinical **observations** have revealed **that** plasma adiponectin concentration is inversely correlated with the risk of myocardial infarction (3). (1) (the Students')

4.2.1.4 Authors and Referred Authors as Unmarked Themes

'Referred authors' of unmarked Theme is found to have lower occurrences in the Introductions. According to Table 4.2, students prefer to adopt more 'referred authors' of unmarked Themes than professionals in the sections. This type of unmarked Theme in the Introductions of students' draft RAs is usually followed by material processes through experimental verbs (*demonstrate, show and suggest*) indicating research methodologies or results. In such a way, they are likely to establish a textual interaction with academic members through quoting specific authors of published papers, contributing to reliability and persuasiveness in reviewing literature. Sample cases of this pattern could be typified in the following examples (referred authors by the bold red parts, textual Themes by the bold green parts and underlined parts for material processes).

Cardio 4.10 **Murry et al** have demonstrated **that** a succession of short periods of myocardial ischemia and reperfusion prior to the continuous maintenance of coronary reperfusion protects the myocardium against subsequent prolonged ischemic insults, **which** has been termed 'ischemic preconditioning' (IPC). (I) (the Students)

Physio 4.9 **Hashimoto et al.**^[23,24] showed HN and its derivative did not reduce the production of A β , **but** cumulative evidences have shown that HN could effectively protect neuronal cell against nearly all AD-related insults, such as various FAD genes, anti-APP antibody, and neurotoxic A β peptides (A β 1-42, A β 1-43, and A β 25-35) *in vitro*. (I) (the Students')

Physio 4.10 **Zou et al.**^[27] suggested **that** the interaction of HNG with A β 1-40 could decrease A β -induced calcium rise and cell apoptosis by altering fibrogenesis of A β 1-40. (I) (the Students')

On the contrary, there is only one occurrence of referred authors as unmarked Theme in the Introductions of published professional medical RAs. In this case, 'cited authors' of unmarked Theme is tailed by a material process through a reporting verb, which manifest the possible outcomes out of their own investigation. This pattern could be shown as follows (the underlined part for the reporting verb).

Cardio 4.11 Dong and Ren¹⁴ have reported **that** APN is capable of improving cardiomyocyte dysfunction in *db/db* diabetic obese mice.
(/) (the Published)

Apart from ‘research-oriented objects’, ‘epistemic nouns’, ‘referred studies’ and ‘referred authors’ as subject heads for unmarked Themes, the presence of ‘existential There’ has lower occurrences in the Introductions of medical RAs. ‘Reference’ as unmarked Theme, mainly in the manifestation of pronoun *this*, is rarely employed by both professionals and students in the beginning sections of their RAs.

4.2.2 Structures of Marked Theme

Table 4.3 Cases of Circumstantial Marked Themes in the Introductions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Place	6	25.00	8	42.11
Reason	---	---	1	5.26
Concession	1	4.17	---	---
Purpose	2	8.33	2	10.53
Temporal Location	5	20.83	2	10.53
Manner	6	25.00	4	21.05
Condition	4	16.67	2	10.53

Unlike the dominant position of unmarked Theme in the Introductions of medical RAs, marked Theme has its lower presence in the sections. It is found that all marked Themes in the Introduction sections are realised by circumstantials. As shown in Table 4.3, the most frequent cases of marked Themes employed by both medical professionals and students are circumstantials of place, manner, and temporal location.

However, differences arise in that professionals tend to adopt more circumstances of temporal, condition and manner, while students prefer to use more place circumstantial in the sections.

4.2.2.1 Circumstances of Place as Marked Themes

As manifested, the greatest concentration of marked Theme employed by both professionals and students in the Introductions are circumstances of place. Cases of place circumstantials mainly represent elements in research design. For example (the bold olive green parts for place circumstantials),

Physio 4.11 **In this study**, we asked whether CaMKII/PKC and/or cAMP pathways function in cognitive impairment seen in NVH-lesioned rats as a schizophrenia-like model. (I) (the Published)

At other times, place circumstantials are used by students to specify the situational aspects of research achievements in literature reviews in the Introductions. Cases of this type of marked Theme could be signified as follows.

Cardio 4.12 **In cardiomyocytes**, Ca^{2+} is transported from cytoplasm into SR by SR Ca^{2+} -ATPase (SERCA), which is critical in regulating the flux of $[\text{Ca}^{2+}]_i$ (21, 22). (I) (the Students')

Physio 4.12 **Among the STATs**, STAT3 seems to be important for HN-mediated neuroprotection. (I) (the Students')

Quite sparingly, place circumstantial of marked Theme may be used by students to express external contrast in locations concerning the present research. This is possible to be characterised in the following example.

Physio 4.13 **In our previous experiments**, we also found that $\text{A}\beta_{31-35}$, a shorter sequence than $\text{A}\beta_{25-35}$, could induce may similar neurotoxic actions as that induced by $\text{A}\beta_{25-35}$ or full length of $\text{A}\beta$, such as inducing apoptosis in cultured cortical neurons [12, 14] and PC12 cell [17]. (I) (the Students')

4.2.2.2 Manner Circumstantials of Marked Themes

Circumstances of manner as marked Themes in the Introductions are materialised mainly through prepositional structures. Manner circumstantials in thematic position by means of prepositional structures are employed normally to summarise research accomplishments in reviewing literature. For instance (the bold blue parts for circumstantial manner marked Themes),

Physio 4.14 **From this point of view**, preventing the A β -induced neuroinflammation and cell apoptosis is of great importance for the development of therapeutic strategies. (I) (the Published)

Cardio 4.13 **During CPB**, ischemia/reperfusion injury is inevitable, because most of the hearts have to be arrested thus experiencing a period of ischemia, and then must be reperfused. (I) (the Published)

Physio 4.15 **Upon hyperphosphorylation**, tau dissociates from the microtubules and subsequently sequesters normal tau and other microtubule-associated proteins, which inhibits assembly and depolymerizes microtubules^[5]. (I) (the Students')

Physio 4.16 **According to some reports**, CaMK II also regulates the frequency-response function of hippocampal synapses for the production of LTD just like LTP. (I) (the Students')

Physio 4.17 **To our knowledge**, three in vivo studies to date have revealed that intracerebroventricular injection (icv) of HNG can respectively improve cognitive impairment induced by icv injection of scopolamine, 3-quinuclidinyl benzilate and A β 25-35. (I) (the Published)

Occasionally, students employ manner circumstances of marked Themes through adverbial structures in the sections. Marked Theme realised in this way might be considered as a coherent way to organise relevant literature reviews, from which valuable insights could be elicited based on previous academic investigations. This type of marked Theme is characterised as follows.

Cardio 4.14 **Consistent with this**, ALDH2 knockout exacerbated I/R injury²³. (I) (the Students')

4.2.2.3 Circumstances of Temporal Location as Marked Themes

Temporal circumstantials of marked Themes in the Introductions normally refer to temporal location or extent of relevant scientific research in literature reviewed. In the sections, temporal location or extent is mainly realised through prepositional structures and temporal adverbs (seen in the example **Physio 4.19**). Sample cases of temporal location/extent as marked Themes (the bold brown parts) are shown as follows.

Physio 4.18 **Over the past 20 years**, a substantial number of epidemiological reports have shown that long-term use of non-steroidal anti-inflammatory drugs (NSAIDs) is associated with protection from the development of AD. (I) (the Published)

Cardio 4.15 **In 1999**, Zhang et al. demonstrated the existence of CRP in human coronary arteries [5]. (I) (the Published)

Physio 4.19 **Recently**, Degterev et al. have demonstrated that stimulation of Fas/TNFR in the absence of intracellular apoptosis signaling is capable of activating a common nonapoptosis death pathway, which was subsequently described as necroptosis^[12]. (I) (the Students')

4.2.2.4 Condition Circumstantials of Marked Themes

Circumstances of condition as marked Themes are primarily construed through prepositional structures in the Introductions. This type of marked Theme is adopted to make reference to situational conditions, under which research outcomes may be achieved. For example (the bold orange parts for condition circumstantials),

Cardio 4.16 **Beyond its well-defined insulin-sensitizing, antiatherogenic, and anti-inflammatory properties**, APN has recently been found to have cardioprotective activities. (I) (the Published)

Cardio 4.17 **In response to ER stress**, there is a significant up-regulation of 78-kDa glucose-regulated protein (GRP78), ER chaperones, and GRP78 is normally regarded as an indicator reflecting the activation of ER stress. (I) (the Students')

Quite occasionally, conditional circumstantial of marked Theme is materialised through non-finite structure (V-ed structure) by professionals in the Introductions. In such a way, they attempt to signify the research design in their own investigation. This type of thematic structure can be reflected as follows.

Physio 4.20 **Taken together**, our observations suggest that NVH-lesioned rats represent a useful model in which to test cognitive enhancers as schizophrenic therapeutics. (I) (the Published)

4.2.2.5 Circumstances of Reason, Concession and Purpose as Marked Themes

Circumstances of purpose as marked Theme in the Introductions of medical RAs are all realised by non-finite structure *to + verb*. For example (the bold red parts),

Cardio 4.18 **To address this issue**, in this study, we established an in vitro cardiomyocyte hypoxia/reoxygenation (H/R) model and examined the effects of APN on reoxygenation injury. (I) (the Published)

Physio 4.21 **To further interpret these issues**, the purposes of the present study were to: (1) clarify the effects of gAd on myocardial I/R injury; (2) elucidate the effects of gAd on the ER stress *in vivo* and *in vitro* conditions; (3) validate whether gAd inhibits ER stress by restoring SERCA functions and maintaining $[Ca^{2+}]_i$ homeostasis during I/R and H/R; and (4) determine the role of PI3K/Akt as a pathway for gAd functioning against SERCA dysfunction and ER stress. (I) (the Students')

There are scarce occurrences of reason and concession circumstantials as marked Themes in the Introductions. Circumstance of concession as marked Theme in the sections is construed by professionals through a prepositional structure, while reason circumstantial in the Introductions of students' draft RAs is realised by a non-finite structure V-ing. Examples are represented as follows (the bold light blue for reason circumstantial and the bold tea colour for concession circumstance).

Physio 4.22 **Affecting tens of millions of people worldwide**, AD is predicted to increase almost twice the frequency during the next 30 years^[2, 3]. (I) (the Students')

Cardio 4.19 **Despite the importance of APN in cardiac protection**, relatively little is known about the underlying molecular mechanisms.
(/) (the Published)

Based on the analysis, it could be summarised that the frequent pattern of marked Themes in the Introductions are materialised by place, temporal, manner and conditional circumstantials. Quite often, these types of marked Themes are realised by prepositional structures. On the other hand, marked Themes may be construed by V-infinitive or V-ing structures, which could be found in circumstances of purpose and reason.

4.2.3 Characterisation of Textual Theme

Table 4.4 Frequent Textual Themes in the Introductions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Conjunctions	30	57.69	49	70.00
Conjunctive Adjuncts	22	42.31	21	30.00

In this section, textual Themes in the Introductions of medical RAs will be characterised by means of conjunction and conjunctive adjuncts. In general, both professionals and students use a higher proportion of conjunctions than adjuncts in the sections. Moreover, they employ similar frequency of conjunctive adjuncts in achieving the cohesive property of the Introductions. However, students adopt higher percentages of structural conjunctions in textual organisation. The distribution of types of textual Themes in the Introductions is represented in Table 4.4.

In the Introductions of medical RAs, the more frequent occurrence of textual Theme is materialised by structural conjunction linkers such as 'and'. For example (the bold green parts for conjunctions),

Physio 4.23 Treatment of rodents or humans with N-methyl-D-aspartate (NMDA) receptor antagonists such as MK-801, phencyclidine (PCP) or ketamine promotes cognitive impairment and enhances positive and negative symptoms (Krystal et al., 1994; Lisman et al., 2008), **and** these drugs also reportedly exacerbate symptoms in patients with schizophrenia (Steinpreis, 1996; Jentsch and Roth, 1999). (I) (the Published)

Quite frequently, this conjunction linker is combined with conjunctive adjuncts. This feature may be signified in the following examples (the bold blue parts for conjunctive adjuncts).

Cardio 4.20 **Likewise**, the proportion of patients with elevated CRP values increases with the severity the cardiovascular disease **and** serum CRP-levels are elevated in patients with unstable as opposed to patients with stable coronary artery disease. (I) (the Published)

Physio 4.24 **Therefore**, A β has been recognized as a critical event in the pathogenesis of AD, **and** "A β hypothesis" has been accepted and used to explain the main cause of AD^[5, 6]. (I) (the Students')

Professionals seem to employ more types of structural binders like *as*, *that*, *given that*, *whether*, *which*, *though*, *while*, *etc* in hypotactic clauses in the sections. In comparison, students tend to use quite limited scope of such binders, which normally involve *as*, *that*, *which*, *whether*. It needs to be noted that professionals use the binder 'while' in two different ways, which denotes concession (seen in example **Cardio 4.21**) in one case and comparison in the other (seen in example **Physio 4.25**). This distinctive feature could be typified as follows.

Cardio 4.21 **While** propofol protects ischemia/reperfusion heart mainly via enhancement of endogenous antioxidant capacity in myocardium, this is totally different from isoflurane preconditioning. (I) (the Published)

Physio 4.25 The blockade of the cholinergic system resulted in transient cognitive impairment; **while** acetylcholinesterase inhibitors enhanced memory functions. (I) (the Published)

Another structural binder 'as' is used by both professionals and students in the Introductions, but in two different ways. Professionals employ conjunction 'as' of textual Theme indicating the denotative meaning of time. However, students adopt it as textual Theme, representing the meaning of reason. This contrast may be reflected as follows.

Cardio 4.22 **In addition, as** the population ages, the problem of ischemia/reperfusion injury is likely to increase **given that** elderly hearts are more susceptible to ischemia/reperfusion injury. (I) (the Published)

Cardio 4.23 **As** anesthetic-induced preconditioning can also be demonstrated in humans, a thorough understanding of the signal transduction involved might have an impact on the clinical applicability of cardioprotection by APC. (I) (the Students')

With regard to textual Themes by conjunctive adjuncts, professionals employ more varieties than students in the Introductions, involving *however, likewise, in addition, moreover, additionally*, etc. As for students, they use different adjuncts such as *also, nonetheless, so*, etc in the sections. Under many circumstances, structural conjunctions are joined with conjunctive adjuncts, which is a common pattern adopted by both professionals and students in the Introductions. In some cases, the same structural linkers could delicately be in joint with different adjuncts, producing different effects of textual organisation. Given the conjunction linker 'whether', medical professionals combine it with adjunct 'however' whereas medical students pattern it with adjunct 'thus'. It might be argued that professionals use this pattern to reflect the possible deficiency in previous research, while students resort to their pattern showing the problems they would solve in their own investigation. Two different patterns may be

demonstrated as follows.

Physio 4.26 **However, whether** changes function in cognitive impairment seen in NVH-lesioned rats is unknown. (I) (the Published)

Physio 4.27 **Thus,** the present study is to determine **whether** Nec-1 protects rat's cultured cortical neurons from okadaic acid-induced injury and **whether** necroptosis contributes to OA-induced neurotoxicity. (I) (the Students')

General speaking, students adopt a higher proportion of textual Themes than professionals in the Introductions. However, professionals seem to employ more varieties of structural linkers and adjuncts in contributing to the cohesive textual organisation in the sections. Significantly, professionals tend to construct more patterns of textual Themes than students in structuring the sections.

4.2.4 Choices of Interpersonal Theme

In the Introductions of medical RAs, it is found that only professionals employ interpersonal Theme in the sections, which is normally realised by adverbs, representing the writer's assessment of what are to be stated. (Martin, Matthiessen and Painter, 2010). For example (interpersonal Themes by the bold purple parts and the bold green parts for textual Themes),

Physio 4.28 **Notably,** typical and atypical antipsychotic drugs antagonize hyperlocomotion, **and** atypical antipsychotic drugs such as risperidone improve PPI deficits observed in these rats. (I) (the Published)

Physio 4.29 **Indeed,** activation of both is critical to induce long-term potentiation (LTP) in the hippocampal CA1 region. (I) (the Published)

4.2.5 Structures of Thematized Comment

As indicated in Table 4.1, thematized comment is employed by students more frequently than professionals in the Introductions. In most cases, both medical

professionals and students use the typical representing thematic structures, commenting on 'value or validity of what they are about to say' (Thompson, 2004: 129). Basically, professionals employ quite different thematising structures of comment from students and these comments are normally patterned with textual Themes. Among the three occurrences of thematised structures, two of them are structured by subject *it* with linking verbs and comment adjectives (seen in the examples **Cardio 4.24** and **Physio 4.31**). The remaining one is composed of a negative comment (seen in the example **Physio 4.30**). Cases of Thematised comment could be summarised as follows (the bold dark blue parts for thematised comment, textual Themes by the bold green parts).

Cardio 4.24 **Thus, it is reasonable** to hypothesize that combination use of these two anesthetics could further attenuate ischemia/reperfusion-induced oxidative stress through respective pathways. (*I*) (the Published)

Physio 4.30 **However, it is not known** whether DA or glutamate is more critical in terms of cognitive impairment in NVH-lesioned rats. (*I*) (the Published)

Physio 4.31 **Thus, it is critical** to further examine HNG's ability to inhibit A β -induced toxicity in AD pathogenesis in vivo. (*I*) (the Published)

On the other hand, students use the same thematised structures of comment, but with different commenting adjectives. The structures are usually combined with textual conjunctions or conjunctive adjuncts. For example (the bold green parts for textual conjunctions, and textual conjunctive adjuncts by the bold blue parts),

Cardio 4.25 **But it is unclear** whether gAd confers cardioprotection by restoring SERCA2a to maintain [Ca²⁺]_i homeostasis. (*I*) (the Students')

Cardio 4.26 **It has become clear** that multiple cellular pathways participate in the establishment of a cellular phenotype that makes the heart more resistant to ischemic damage. (*I*) (the Students')

Physio 4.32 **Therefore, it is very attractive** for us to clarify if A β 31-35 could also exhibit similar behavioral impairment of learning and memory induced by A β 25-35. (*I*) (the Students')

It is noted that medical students use a quite unusual thematised structure for commenting on what they are to state. In this case, thematised comment is structured by subject *it* with a linking verb and a noun (seen in the example **Physio 4.33**).

Physio 4.33 **Especially, it is still an open question** whether the phospholated level of CaMK II has been changed during A β -induced suppression of LTP. (I) (the Students')

Another way of structuring thematised comment in the Introductions is through some reporting verbs to demonstrate the implicit evaluative outcomes or achievements within certain academic areas. These verbs mainly involve *find*, *report* and *show*. Cases of this type of thematised comment may be represented as follows.

Physio 4.34 **It has been found** that the signal transducer and activator of transcription (STAT) factors were originally described as growth factor and interferon-inducible DNA binding complexes^[30, 31]. (I) (the Students')

Physio 4.35 **It is reported** that postsynaptic application of a CaMK II inhibitor [autocamtide-3 derived peptide inhibitor (AC3-I), 2 mM] blocked LTP induction [19] [20]; the mice with a point mutation of alpha-CaMK II gene that blocked the autophosphorylation of Threonine at position 286 (Thr286) of this kinase had no N-methyl-D-aspartate receptor-dependent LTP in the hippocampal CA1 area and showed no spatial learning in the Morris water maze [21]. (I) (the Students')

Physio 4.36 **It has been shown** that S14G-HN (HNG), a derivative of HN with substitution of Gly for Ser14, enhances its neuroprotective activity to an extent about 1000-fold than HN, which is effective at low concentrations against AD-relevant insults (Nishimoto et al., 2004; Niikura et al., 2004). (I) (the Published)

It could be observed that both professionals and students share the preference of employing a type of comments in thematic position, for which the structures are combined with reporting verbs to represent the implicit evaluation. Although professionals use a lower proportion of thematic comments than students in the sections, it seems that they have smarter choices of adjectives in traditional

representative structures of thematised comments. In comparison, students adopt quite limited choices in structuring this type of comments.

4.3 Thematic Structures in the Discussions of Medical RAs

Section 4.2 of this chapter has approached thematic choices in the Introductions of medical RAs. In the present section, choices of thematic structures in the Discussions of both published professional and students' draft medical RAs will be dealt with. Different types of Themes frequently occurred in the Discussion sections of medical RAs are manifested in Table 4.5.

Table 4.5 Frequent Theme Types in the Discussions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Unmarked Theme	253	55.60	285	57.69
Marked Theme	40	8.79	39	7.89
Textual Theme	140	30.77	140	28.34
Interpersonal Theme	9	1.98	6	1.21
Existential 'There'	5	1.10	3	0.61
Thematised comment	8	1.76	21	4.25

In general, professionals and students adopt similar percentages of marked and textual Themes in the Discussions. As shown in Table 4.5, the most dominant cases of thematic structures in the sections are unmarked, textual and marked Themes.

However, the distinguishing line between professionals and students in thematic choices goes to the proportion of unmarked Theme and thematised comment.

In achieving cohesive property of the Discussion sections, students resort to a higher proportion of unmarked Theme and thematised comment than professionals. Patterns of thematic structures in the Discussions of medical RAs will be delineated in the following sections.

4.3.1 Features of Unmarked Theme

It is found that the most dominant pattern of thematic choice is unmarked Theme in the Discussions. Varieties of subject heads as unmarked topical Themes in the sections are employed by both professionals and students, which could be displayed in Table 4.6.

Table 4.6 Cases of Subjects for Unmarked Themes in the Discussions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Research-oriented objects	88	32.00	186	65.49
Referred authors	5	1.82	4	1.41
Authors	29	10.55	15	5.28
Existential 'There'	5	1.82	3	1.06
Referred studies	26	9.45	14	4.93
Research purpose	---	---	---	---
Reference	3	1.09	3	1.06
Epistemic nouns	119	43.27	59	20.77

According to Table 4.6, the most dominant cases of subjects as unmarked Themes in the sections are 'research-oriented objects', 'epistemic nouns', 'authors' and 'referred studies'. In presenting and discussing research outcomes, professionals are

inclined to adopt higher percentages of epistemic nouns, authors and referred studies as heads of unmarked Themes. In contrast, students rely on using a higher proportion of research-oriented objects as subject heads of unmarked Themes.

4.3.1.1 Epistemic Nouns of Unmarked Themes

The higher occurrence of epistemic nouns as unmarked Themes in the Discussions might reveal the needs for abstractions and generalisations of the scientific research in medical areas. As indicated in Table 4.6, professionals employ a larger portion of epistemic nouns in contributing to the cohesive argumentative nature of the Discussion sections. Due to the necessity of discussion and argumentation in the sections, the presence of the epistemic nouns could be predicted. The most frequent cases of epistemic nouns found (a minimum of twice) in the Discussions involve the following aspects:

activation, data, effect, effects, evidence, finding, findings, mechanism, mechanisms, results, study, studies

In the Discussions, both professionals and students choose to adopt the pattern of epistemic nouns followed by material processes through active voice (verbs such as *demonstrate, indicate, and show*). Thematic patterns in this way could display and compare relevant research results in the sections. For example (the bold orange parts for epistemic nouns, the bold green parts for textual Themes and underlined parts for material processes),

Cardio 4.27 The present **study** demonstrates tissue bound CRP and TF in a large number of coronary target lesions and shows a prevalence for both determinants in plaques of patients with ACS. (D) (the Published)

Cardio 4.28 Findings in the present study indicated **that** thapsigargin (3 μ M) alone or HR alone induced cell apoptosis, and significantly increased the expression of representative genes relating to ER, respectively. (D) (the Students')

Physio 4.37 Several reports show **that activity** of α_1 adrenergic and M_1 muscarinic receptors, **both of which** are coupled with G_q protein, followed by PKC activation, is up-regulated in the mPFC of NVH-lesioned rats, increasing PKC α and PKC β II autophosphorylation at Thr 638 and 641, respectively. (D) (the Published)

In addition, professionals could employ the pattern of epistemic nouns accompanied by material processes through a bunch of verbs including *identify*, *aggravate*, *confirm*, *prove*, *provide*, *suggest*, *support* and *understand*. In such a pattern, they may be better equipped to demonstrate and argue their research outcomes in the Discussions. Characteristic patterns could be typified as follows (underlined parts for material processes).

Cardio 4.29 Thus, **posttreatment** with isoflurane may probably aggravate oxidative damage by increasing free radical release. (D) (the Published)

Cardio 4.30 Moreover, the **association** between statin medication and lower levels of intimal TF confirms *in vitro* data [30] and underscores the potential preventive effect of statins on TF synthesis. (D) (the Published)

Cardio 4.32 Such a **protection** was further proven by the preserved cardiac oxygen utilization and limited cardiac enzyme release. (D) (the Published)

Cardio 4.33 These **findings** collectively suggest **that** interfering with ER stress pathways may account for the beneficial effects of APN on cardiomyocytes. (D) (the Published)

Cardio 4.34 The **concept** of direct proatherogenic effects of CRP is supported by several experimental and *in vitro* work. (D) (the Published)

Cardio 4.35 Although the precise **mechanism** is not fully understood, **activation** of mitochondrial or sarcolemmal K_{ATP} channels and increase of small amount of free radical release during period of preconditioning have been identified to play important roles in this phenomenon. (D) (the Published)

In contrast, students use only two verbs *provide* and *reveal* to construct the material processes for demonstration and discussion of related research results. For

example,

Cardio 4.31 Our **data** provide an insight into the mitochondrial-dependent basis of isoflurane-induced, and PKC ϵ and ALDH2-mediated protection against cardiac ischemia, in vivo and in vitro. (D) (the Students')

Physio 4.38 Very recent **studies** revealed **that** the effects of HNG on the expression of STATs and caspase-3 may be involved in the insulin-sensitizing, the maintenance of glucose homeostasis and the neuroprotection. (D) (the Students')

Apart from these patterns, professionals prefer to infuse epistemic nouns of unmarked Themes with relational processes in the Discussions. In such a way, they tend to compare and discuss aspects of research outcomes. This feature can be signified as follows (relational processes by underlined parts).

Cardio 4.36 The suppressive **action** of APN on ER stress response seems to correlate with the inhibition of p38 MAPK signaling. (D) (the Published)

Physio 4.39 These **results** are similar to the previous observations using animals with icv combined-injection of HNG and anti-cholinergic drugs or A β 25-35 in vivo. (D) (the Published)

4.3.1.2 Research-oriented Objects as Unmarked Themes

'Research-oriented objects' as subject heads of unmarked Themes are also the frequent type of Theme in the Discussions. Notably, nominalised research-oriented objects in thematic position are quite frequent in the sections. The frequent 'research oriented objects' (with a minimum of two occurrences) found in the Discussion sections of published professional medical RAs can be shown as follows.

acetylcholinesterase inhibitor donepezil, A β 25-35, CaMKII autophosphorylation, CaMKII and PKC α signaling, dysfunction, HNG, Humanin (HN), impairment, α 7-nicotinic receptor, noncholinergic antidementic drug memantine, (NVH)-lesioned rats, OKA, Cardioprotective effects of APN, CRP, midazolam, use of isoflurane and propofol

The most frequent cases of research oriented objects as unmarked Themes in the Discussion sections of students' draft medical RAs (with a minimum of two occurrences) are in the following list.

A β 31-35, CaMKII, CaMKII phosphorylation, HN, HNG, hyperphosphorylation of tau, inhibition of PP-2A, intracerebralventricular injection of A β 25-35, LTD, LTP, necroptosis, necrostatin-1 (Nec-1), aldehyde dehydrogenase 2 (ALDH2), apoptosis, CRP, CRP levels, ER stress, globular adiponectin (gAd), PKC ϵ

Unmarked Themes construed by research-oriented objects as subject heads are all accompanied by passive voice in the Discussions. This type of patterning might be taken as an objective way of relaying and manifesting scientific information in the sections. For example (the bold blue parts for nominalizations, textual Themes by the bold green parts and underlined parts for passive voice),

Cardio 4.37 These results suggest **that** the **cardioprotective effects of APN** are mediated, at least partially, through the inhibition of ER stress response.
(D) (the Published)

Physio 4.40 **In summary**, our results demonstrate **that CaMKII phosphorylation** in the CA1 region of hippocampus is simultaneously altered with the changes in synapse plasticity such as LTP and LTD.
(D) (the Students')

4.3.1.3 Authors, Cited Authors of Unmarked Themes

The category of 'authors' as unmarked Themes are represented mainly by the pronoun *we* in the Discussions of medical RAs. The frequent occurrences of the first person pronoun *we* in thematic position in the sections can be expected due to the argumentative nature and discussing needs.

When professionals use 'cited authors' of unmarked Themes in the Discussions, the pronoun *they* are introduced. The pronouns *we* and *they* are found to be patterned with verbs such as *show* and *demonstrate*. In this way, professionals could manifest and compare what they have accomplished in their own research with those in previous relevant investigations. These patterns are indicated as follows (the bold blue parts for authors and textual Themes by the bold green parts).

Physio 4.41 **We** show here **that** treatment with HNG reduced the neuroinflammatory responses, **which** parallels the improvement of A β ₂₅₋₃₅-induced behavioral deficits. (D) (the Published)

Cardio 4.38 Inoue et al. measured serum CRP levels in coronary artery blood sampled just distal and proximal to the culprit lesions in patients with SA and ACS [28]. **They** could demonstrate a translesional gradient with higher distal CRP values in both groups. (D) (the Published)

In comparison, students also employ the first person pronoun 'we' to present what they have achieved in their studies. Normally, the pronoun 'we' is combined with verbs like *find* and *observe* in the Discussions. Characteristic patterns could be shown in the following.

Physio 4.42 **We** also found **that** intracerebralventricular injection of A β ₂₅₋₃₅ time-dependently reduced phosphorylated CaMK II. (D) (the Students')

Cardio 4.39 **We** observed **that** isoflurane pretreatment led to PKC ϵ translocation to mitochondria. (D) (the Students')

4.3.1.4 Referred Studies as Unmarked Themes

Quoted studies of unmarked Themes are adopted quite often by professionals to serve the needs for comparing, demonstrating and arguing research results in the Discussions. This type of unmarked Theme is normally signified through a set of epistemic nouns. It is found that both professionals and students employ 'quoted studies' of unmarked Themes in joint with material processes through a group of verbs.

As for professionals, material processes in this pattern are usually realised by verbs such as *increase*, *propose*, *show*, *suggest* and *support*, which could be exemplified as follows (the bold brown parts for referred studies, textual Themes by the bold green parts and underlined parts for material processes).

Cardio 4.40 **As** reported previously, **pretreatment** with a clinically relevant dose of isoflurane (1.1-2 vol%) increased free radical release and protected the myocardium from a subsequent prolonged ischemia, **which** is similar to the effect of ischemic preconditioning (Kersten et al., 1997; Piriou et al., 2000; Roscoe et al., 2000). (D) (the Published)

Physio 4.43 Several **hypotheses** have been proposed, such as interfering with Bax activation, regulating insulin-like growth factor-binding protein 3, inhibiting proapoptotic Bcl-2/Bax family protein BimEL, downregulation of P38 MAP kinase, and so on (Guo et al., 2003; Ikonen et al., 2003; Luciano et al., 2005; Wang et al., 2005). (D) (the Published)

Cardio 4.41 Recent **data** show that expression of human CRP in mice accelerates aortic atherosclerotic lesion progression, thus providing evidence that CRP is an active player in atherogenesis *in vivo* [16]. (D) (the Published)

Physio 4.44 Our earlier **reports** suggested that memantine (a NMDA receptor antagonist) **and** anticholinergic drug, donepezil is reported to exert protective effect against intracellular [Ca²⁺]_i (Kamat et al., 2010) and glutamate toxicity in cultured cortical neurons (Akasofu et al., 2006). (D) (the Published)

Cardio 4.42 This **hypothesis** has recently been supported by studies **that** could detect CRP mRNA within atherosclerotic plaques and aneurismal tissue [6, 9, 15]. (D) (the Published)

Sometimes, professionals may pattern referred studies with relational processes for comparison and discussion of experimental results in the sections. For example (relational process by the underlined part),

Physio 4.45 These **results** are similar to the previous observations, using animals with icv combined-injection of HNG and anti-cholinergic drugs or A β 25-35 *in vivo* (Mamiya and Ukai, 2001; Krejcova et al., 2004; Tajima et al., 2005). (D) (the Published)

Occasionally, professionals could employ referred studies of unmarked Themes tailed by a mental process through verb like *think* to produce the possible

effects out of aspects of research outcomes. This feature may be signified in the following example (the underlined part for mental process).

Cardio 4.43 In addition, **posttreatment** with propofol is thought to be potential in enhancement of endogenous antioxidant capacity and clean of oxidative products, such as superoxide and peroxyxynitrite (Allaouchiche et al., 2001; Kobayashi et al., 2008; Murphy et al., 1992; Tsuchiya et al., 2002). (D) (the Published)

In contrast, students only use the pattern of 'cited studies' with material processes in the Discussions. Moreover, material processes are realised through quite limited verbs, which incorporate *focus*, *report* and *show*. The following examples can represent this feature (underlined parts for material processes).

Physio 4.46 Many **researches** focus their attention on N-methyl-D-aspartate (NMDA) receptor-dependent intracellular signaling cascade. (D) (the Students')

Cardio 4.44 Recent **studies** reported that PKC ϵ targeted the inner mitochondrial membrane and phosphorylated a number of intra-mitochondrial proteins^{18, 43, 44}. (D) (the Students')

In order to demonstrate, argue and discuss the results of the academic research in the Discussions, professionals characterise these needs by using a higher proportion of epistemic nouns, referred authors and referred studies as subject heads of unmarked Themes. In the meanwhile, they reduce their focus on research oriented objects of unmarked Themes in the sections. In comparison, students still adopt more presence of research oriented objects of unmarked Themes in the Discussions. This difference may provide some implications for future pedagogy.

4.3.2 Structures of Marked Theme

Table 4.7 Cases of Circumstantial Marked Themes in the Discussions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Place	14	35.00	18	47.37
Reason	1	2.50	---	---
Concession	---	---	---	---
Purpose	1	2.50	3	7.89
Temporal Location	6	15.00	1	2.63
Manner	16	40.00	10	26.32
Condition	2	5.00	6	15.79

All marked Themes in the Discussions of medical RAs are construed through circumstantials. The proportion of marked Themes adopted by professionals and students varies in the sections, which may be shown in Table 4.7. As reflected in Table 4.7, the most dominant marked Themes in the Discussion sections are circumstances of place and manner. However, sharp contrast arises in that professionals employ a higher proportion of manner and temporal circumstantials while students prefer more circumstances of place and condition. These distinctive features of circumstantials as marked Themes in the Discussions will be presented in the different sections followed.

4.3.2.1 Manner Circumstantials of Marked Themes

Manner marked Themes in the Discussions normally represent methods by which certain aspects of outcomes are achieved in medical research. A large portion of manner marked Themes are adopted by professionals and students through various

prepositional structures. These structures could be exemplified in the following list (the bold red parts for circumstantial manner and textual Theme by the bold green part).

- Physio 4.47** **As a second messenger**, the influx of Ca²⁺ into the neuron activates important protein kinases, in which CaMK II is a crucial enzyme for LTP induction. (D) (the Students')
- Physio 4.48** **Therefore, based on the present findings** we may suggest that OKA (i.c.v) induced degenerative change in the cortical and hippocampal region may be an important factor for cholinergic dysfunction. (D) (the Published)
- Cardio 4.45** **In agreement with our results**, isoflurane-treated mice subjected to ischemia and 2 weeks of reperfusion showed reduced expression of proapoptotic genes, significantly decreased expression of cleaved caspase-3, and TUNEL staining⁵. (D) (the Students')
- Cardio 4.46** **By integrating over time rather than looking at individual measurement**, a more accurate estimate of the overall recovery of cardiac function can be achieved. (D) (the Published)
- Physio 4.49** **From our data**, inhibition of neuroinflammatory responses by HNG may possibly contribute to the reduction of apoptotic cells induced by A β 25-35, since a loose link exists between inflammation and apoptosis. (D) (the Published)
- Cardio 4.47** **In contrast to our data**, no difference of intimal CRP staining intensity between stable plaques and plaques with signs of erosion or rupture was observed. (D) (the Published)

Sometimes, professionals choose to use adverbs as manner circumstantial of marked Theme in the sections. For example,

- Cardio 4.48** **Histopathologically**, an association between intimal detection of CRP/TF and ruptured areas and thrombus formation was seen. (D) (the Published)

4.3.2.2 Circumstances of Place as Marked Themes

In most cases, place circumstantials in the Discussions are used for placing reference to aspects of medical investigations, which could help writers away from anchoring any direct presentation and discussion of research results. This type of marked Theme may be typified as follows (the bold purple parts).

- Cardio 4.49** **In this context**, our *ex vivo* data demonstrate also a positive correlation between intimal CRP and TF expression. (D) (the Published)
- Physio 4.50** **In our findings**, we have shown that Nec-1 inhibits OA-induced decrease of cell viability and reduces OA-induced LDH leakage. (D) (the Students')
- Cardio 4.50** **In our H/R model**, HIF-1 α expression was markedly increased by the H/R treatment, indicative of induction of adaptive hypoxic responses. (D) (the Published)

At other times, circumstances of place as marked Themes in the sections may reflect external features, which involve the mentioning of research outcomes from previous relevant studies. In this way, professionals and students may highlight the accomplishments and deficiencies in their own studies through comparison. The following examples can represent this feature.

- Physio 4.51** **In experimental studies**, OKA (i.c.v) induces memory impairments in rat that is suitable model to screen for antideementia activity. (D) (the Published)
- Physio 4.52** **In their experiments**, immunoblot analysis was conducted to measure autophosphorylation of CaMK II at Thr286 in rat hippocampal slices, and they found that cute application of A β ₁₋₄₂ inhibited denate LTP and associated phosphorylation processes ^[37]. (D) (the Students')

Quite rarely, students may use adverbs as place circumstantial construing for marked Theme in the Discussions. For instance,

- Cardio 4.51** **Here**, we showed that isoflurane preconditioning increased the phosphorylation of ALDH2. (D) (the Students')

4.3.2.3 Temporal Location Circumstantials of Marked Themes

Temporal circumstantials are frequently adopted by professionals in the Discussions of medical RAs, indicating the temporal location or extent concerning the relevant scientific research. Circumstances of temporal location or extent are mainly realised through prepositional structures (seen in the example **Cardio 4.52**) as well as

some temporal adverbs (seen in the example **Physio 4.53**) in the sections. These thematic structures could be represented as follows (the bold olive green parts).

Cardio 4.52 ... **for the first time** our study revealed *ex vivo* a positive correlation between intimal tissue bound CRP and circulating serum CRP in ACS and SA patients based on quantitative analysis of intimal CRP expression. (D) (the Published)

Physio 4.53 **Initially**, we examined the effects of HNG on A β 25-35-induced cognitive dysfunction. (D) (the Published)

4.3.2.4 Condition Circumstantials of Marked Themes

In the Discussions of medical RAs, students tend to employ more circumstances of condition as marked Themes, which primarily represent the situational aspects of research results. Circumstantial conditions of marked Themes are usually reflected by prepositional structures, which can be exemplified in the following (the bold orange parts for circumstantial conditions and textual Themes by the bold green parts).

Cardio 4.53 **However, in the case of intense or prolonged ER stress**, the UPR will eventually result in cell death, typically apoptosis. (D) (the Published)

Physio 4.54 **With respect to the mechanisms of LTD**, Ca²⁺ influx is also thought to be important for the synaptic plasticity just like in the LTP. (D) (the Students')

Under some circumstances, students choose to use non-finite structures through v-ed form as condition circumstantial of marked Theme in the Discussions. For example,

Cardio 4.54 These all suggested **that compared with BMS implantation**, DES implantation can decrease the inflammatory response. (D) (the Students')

In comparison with structures of marked Theme in the Introductions, it is found that professionals tend to concentrate more on the argumentative needs, discussing and comparing nature in the Discussion sections. To argue and discuss the outcomes of scientific investigations in the sections, they prefer to employ more temporal and manner circumstantials. In this way, they could effectively interpret and discuss research methodologies and results out of their own studies with those in other previous related ones. On the other hand, students still focus on drawing on readers' attention to elements in research design of their scientific explorations in the Discussions.

4.3.3 Choices of Textual Theme

Table 4.8 Frequent Textual Themes in the Discussions of Medical RAs

Types of Theme	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Conjunctions	100	68.03	90	64.29
Conjunctive Adjuncts	47	31.97	50	35.71

Although professionals and students adopt similar percentages of textual Themes in the Discussions, differences arise when it comes to the proportion of each type of them. Professionals resort to a higher proportion of structural linkers, whereas students prefer to use a bit more conjunctive adjuncts to achieve the cohesive property of the sections. The distribution of types of textual Themes in the Discussions of medical RAs is manifested in Table 4.8.

Both professionals and students employ varieties of structural linkers and conjunctive adjuncts in the Discussions. Cases of conjunctions (the bold green parts) and conjunctive adjuncts (the bold blue parts) for textual Themes could be exemplified in the following list.

- Cardio 4.55** **Despite** we have reported the synergy of isoflurane and propofol in a clinical research, the current study is the first to address the effect and in particular the mechanism in a clinically relevant model CPB.
(D) (the Published)
- Physio 4.55** **By contrast**, consistent with its lack of effect on cognitive dysfunction, acute risperidone treatment did not restore decreased CaMKII and PKC α autophosphorylation or PKC α -dependent NR1 phosphorylation.
(D) (the Published)
- Cardio 4.56** **So far**, several mechanisms have been proposed including AMPK dependent mechanisms, reduction of oxidative/nitrative stress and activation of Akt^(36, 37). (D) (the Students')
- Cardio 4.57** **Accordingly**, cellular mechanisms underlying gAd-induced cardioprotection through suppression of ER stress need to be defined.
(D) (the Students')
- Cardio 4.58** **In conclusion**, the preexposure to APN provides protective effects on H/R-induced cardiomyocyte injury, **which** is likely associated with an inhibition of ER stress response through down-regulation of ER stress-related genes including GRP78, CHOP, and caspase-12.
(D) (the Published)
- Cardio 4.59** **In summary**, our results demonstrate **that** isoflurane preconditioning increased the phosphorylation of mitochondrial ALDH2 **which** was mediated by mitochondrial PKC ϵ and is required for cardiac protection against I/R. (D) (the Students')

Both professionals and students adopt more occurrences of structural linkers in the Discussions. This phenomenon might suggest that they pay the similar attention to the coherent construction of larger chunks of texts because of the argumentative needs of the sections.

4.3.4 Characterisation of Interpersonal Theme

Interpersonal aspects of Theme in the Discussions of medical RAs are construed by different structures. The majority of interpersonal Themes in the sections are realised by adverbs, representing the writer's 'assessment of what is being exchanged' (Martin, Matthiessen and Painter, 2010: 25). This type of structure could be signified as follows (the bold dark red parts for interpersonal Themes and textual Themes by the bold green parts).

- Cardio 4.60** **Most interestingly**, APN pretreatment significantly decreased the levels of the ER stress-related genes under H/R conditions. (D) (the Published)
- Physio 4.56** **Probably**, HNG improves A β -induced behavioral deficits via reducing inflammatory responses and apoptotic cells caused by A β . (D) (the Published)
- Physio 4.57** **Indeed**, basal phosphorylation levels at some sites of tau are thought to play an important role in the normal regulation of tau function and microtubule dynamics^[19]. (D) (the Students')
- Physio 4.58** **Of course**, further studies are required to determine the interaction of CaMK II with other signaling pathway in A β -induced impairment of synaptic plasticity, including LTP and LTD. (D) (the Students')

Sometimes, professionals are inclined to use a mental process construing for the interpersonal aspects of Theme in the Discussions. For example,

- Cardio 4.61** A recent study also showed **that** midazolam (0.05 mg/kg) abolishes ischemic preconditioning, **but did not think** the midazolam used in induction could interfere with the present result for two reasons. (D) (the Published)
- Cardio 4.62** **Even though** the present data cannot figure out the exact molecular signaling pathway underlying this synergic cardioprotective effect, **we believed** regulation of oxidative stress status in post-CPB myocardium may play an important role in this effect. (D) (the Published)

Only one case of interpersonal Theme is materialised by Wh-element, which signals a required answer from the writer. This pattern could be reflected as follows.

Physio 4.59 **What** are the potential mechanisms involved in the production of LTP and the suppression of LTP in AD? (D) (the Students')

By assessing relevant scientific outcomes appropriately, professionals could better discuss and interpret what they have achieved in the Discussion sections. They not only construe for their personal evaluation in thematic position through adverbs but also through clauses with mental processes. In comparison, it seems that students are not aware of the importance of personal attitude in the sections.

4.3.5 Organisation of Thematized Comment

Thematized comment found in the Discussions of medical RAs involves thematising speakers' comment on validity of what speakers are going to state, and comment on presenting what speakers have achieved in an academic pursuit. Students have a tendency to adopt more thematised structures of comment than professionals in the Discussions. Cases of thematised comment on validity of what speakers are to state could be exemplified in the following (the bold red parts for thematised comment, the bold green parts for textual conjunctions, and marked Themes by the bold blue parts).

Cardio 4.63 **In the past years, it has become clear** that APN is a potent cardioprotective molecule. (D) (the Published)

Physio 4.60 **In the future, it will be important** to completely define the mediators through which HNG treatment prevents/reverses learning memory impairment, by investigating the relationship between inflammatory factors, apoptosis, and HNG. (D) (the Published)

Cardio 4.64 **It is worth pointing out** that, in linear regression analysis, the postischemic cardiac function of each heart was represented by area under the cardiac functional parameters (LVSP, dp/dtmax and dp/dtmin) vs. post-CPB time curves. (D) (the Published)

Physio 4.61 **It seems** that the different levels of phosphorylation of CaMK II are closely related to the induction of hippocampal LTP and LTD. (D) (the Students')

Physio 4.62 **It appears likely** that CaMK II activity is required for the normal production of LTD [40]. (D) (the Students')

Students normally choose to employ verbs such as *document*, *accept*, *testify* and *claim* realising in structuring comment on presenting speakers' achievements in thematic position. This type of comment in thematic position could be highlighted as follows.

Cardio 4.65 **It is well documented** that Ca^{2+} is required for proper protein folding to maintain normal ER function and Ca^{2+} disturbances has been shown to trigger ER stress, in which SERCA activity plays a critical role. (D) (the Students')

Cardio 4.66 **It has been testified** that PI3K/Akt as a protective pathway plays a positive role in ER stress induced apoptosis (28, 29). (D) (the Students')

Physio 4.63 **It has been accepted** that the main signal transduction pathway reaching STAT family transcription factors is mediated by cytokines, cytokine receptors, and Jak family tyrosine kinase proteins^[40]. (D) (the Students')

Cardio 4.67 **Thus, it could be claimed** that the suppression of ER stress by gAd may be a novel cardioprotective mechanism, which could aid us to establish a more effective therapeutic approach to myocardial I/R injury. (D) (the Students')

As shown in Table 4.5, students use a higher proportion of thematised comment than professionals in the Discussions. Moreover, they adopt varieties of structures for commenting on related achievements in thematic positions of the sections. This phenomenon might be caused by the students' strong awareness of the argumentative needs in the Discussions of RAs. Considering the traditional structure of comment, however, they simply employ the structure of subject *it* followed by a relational verb (*seem*) and relational process with *likely*.

4.4 Concluding Remarks

This chapter examined patterns of thematic choices in the Introduction and Discussion sections of medical RA genre. Thematic structures in these two different sections of RAs were characterised. In the Introductions, both professionals and students adopt a higher portion of unmarked, marked and textual Themes to structure textual interaction with community members. From this departure, professionals and students share the similar frequency of textual Themes, but they differ greatly in the proportion of unmarked Theme, marked Theme and thematised comment. Professionals employ more marked Themes to highlight textual prominence; whereas students are inclined to use a higher proportion of unmarked Theme and thematised comments in the Introductions. However, students seem to lack the awareness of the significance of interpersonal Theme in the Introductions, which is absent in their draft RAs.

In terms of grammatical subjects of unmarked Themes in the Introductions, both professionals and students choose to employ 'research-oriented objects', 'referred studies' and 'epistemic nouns' as the most frequent subject heads. However, professionals resort to more 'epistemic nouns' and 'referred studies' as heads of unmarked Themes, while students show the preference of using a higher proportion of 'research-oriented objects' as subjects of unmarked Themes in the sections. In addition, students are inclined to adopt more 'referred authors' as subjects of unmarked Themes in reviewing relevant literature in the Introductions.

All marked themes in the Introductions are realised by circumstantial. The most frequent marked Themes used by both professionals and students in the sections are circumstances of place, manner and temporal location. Professionals endorse

textual prominence by employing more circumstances of temporal, condition and manner, whereas students depend on more place circumstantials in the Introductions.

In organising larger chunks of texts in the Introductions, professionals and students share the similar proportion of conjunctive adjuncts. However, professionals adopt a higher proportion and more varieties of structural linkers to achieve the linking and cohesive functions in the RA genre. When it comes to the thematised comment, professionals could handle more types of comment structures in thematic positions.

On the other hand, some differences arise in the Discussions. Both professionals and students adopt a similar proportion of marked and textual Themes in the sections. However, professionals prefer to employ a bit higher frequency of interpersonal aspects of meaning in thematic position whereas students still tend to use more occurrences of unmarked Themes and thematised comments in the Discussions.

With regard to subject heads for unmarked Themes in the Discussions, the most frequent heads of unmarked Themes used by professionals and students are 'research-oriented objects', 'epistemic nouns', 'authors' and 'referred studies'. In order to interpret and discuss related outcomes, professionals prefer to employ a higher portion of epistemic nouns, authors and referred studies as subject heads of unmarked Themes in the sections. In comparison, students still choose to depend on a lot more research-oriented objects as unmarked Themes.

Given marked Themes, the most dominant marked Themes in the Discussion sections are circumstances of place and manner. However, professionals tend to employ a higher proportion of manner and temporal circumstantials while students prefer more circumstances of place and condition in the sections. In

structuring textual prominence in the Discussions, professionals could better deal with types of marked Themes.

In connecting large parts of texts in the Discussion sections, professionals are inclined to adopt a higher proportion of structural linkers, while students resort to more conjunctive adjuncts to signify the cohesive property. Both professionals and students share a similar proportion of interpersonal Themes in the Discussions, but apparently professionals adopt more types of structures in the construal of linguistic meanings in thematic positions. Students tend to employ more thematised comment, and they also attempt to adopt varieties of comment structures in thematic positions in the Discussions.

All these findings in the Introductions and Discussions of medical RAs may be due to the lack of awareness or challenges in previous writing pedagogy. This could provide a possible orientation and insights for future reforms in pedagogy and syllabus, which will be discussed in Chapter Eight.

Chapter Five Thematic Choices in Medical Reviews

Chapter Four dealt with the characterisation of thematic structures in both the Introductions and Discussions of medical research articles. Through data analysis in this study, features and patterns of thematic choice between medical professionals and students in these two sections of RAs have been categorised and summarised. In the present chapter, medical review articles are about to be approached in terms of its genre features characterised in thematic positions. Thematic structures in the Beginning and Concluding sections of both published professional and students' draft medical reviews will be handled. Respective features of thematic choice in these two different sections of reviews will be examined in the following sections.

5.1 Patterns of Thematic Structure in the Beginning Sections of Medical Reviews

Table 5.1 Frequent Theme Types in the Beginning Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Unmarked Theme	78	52.35	65	53.28
Marked Theme	14	9.40	15	12.30
Textual Theme	45	30.20	37	30.33
Interpersonal Theme	4	2.68	2	1.64
Existential 'There'	3	2.01	1	0.82
Thematised comment	5	3.36	2	1.64

In this section, thematic choices in the Beginning sections of both published professional and students' draft medical reviews will be characterised. Types of Theme adopted by professionals and students in the Beginning sections of medical reviews could be reflected in Table 5.1. Table 5.1 demonstrates thematic choices in the Beginnings used by professionals and students. In general, the most dominant types of Theme present in the Beginning sections are unmarked, textual and marked Themes. Professionals and students choose to employ a quite similar proportion of unmarked and textual Themes to structure textual interaction in the sections. However, the difference lies in that professionals resort to a little higher proportion of thematised comment and interpersonal Theme, whereas students depend on a higher proportion of marked Theme in the Beginnings.

5.1.1 Features of Unmarked Theme

Table 5.2 Cases of Subjects Heads for Unmarked Theme in the Beginning Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Review-oriented objects	39	46.99	36	51.43
Referred authors	1	1.20	2	2.86
Authors	---	---	---	---
Referred studies	5	6.02	7	10.00
Research purpose	3	3.61	---	---
Reference	1	1.20	---	---
Epistemic nouns	34	40.96	25	35.71

In the Beginning sections, unmarked Theme could be realised by cases of subject heads, which are represented in Table 5.2. Category of ‘authors’ as heads of unmarked Themes refer to self-mention pronouns such as *I* or *we*, indicating the authors of academic papers. In terms of ‘referred authors’ as subject heads for unmarked Themes, they are used mainly representing the authors of cited medical reviews. Given ‘referred studies’ as unmarked Themes, it is employed to directly display the quotation of relevant investigations in a certain medical area.

As shown in Table 5.2, professionals and students are inclined to adopt a higher proportion of review objects, epistemic nouns and referred studies as subject heads for unmarked Themes in the Beginning sections. However, professionals employ more epistemic nouns of unmarked Themes while students prefer to higher frequency of review-oriented objects and cited studies for unmarked Themes in the Beginning sections. ‘Research purpose’ of unmarked Theme is used only by professionals. Due to the reviewing feature in the genre, there is no occurrence of ‘authors’ as unmarked Themes in the Beginnings. Cases of subject heads as unmarked Themes in the sections of medical reviews will be reflected in the following.

5.1.1.1 Review-oriented Objects as Unmarked Themes

Table 5.3 Frequent Cases of Review-oriented Objects as Unmarked Theme in the Beginning Sections of Medical Reviews

The Published	The Students’
agonistic β_1 AR autoantibodies, autoantibodies, genes, GLP-1R agonists, volatile anesthetics	β AR family, concentration of isoflurane, isoflurane, neurons, Parkinson’s disease (PD)

‘Review-oriented objects’ as subject heads in thematic positions are found to be construed normally by nominalisations. Frequent cases of review-oriented objects

as unmarked Themes (with a minimum of two occurrences) in the sections are summarised in Table 5.3. Professionals frequently choose to combine ‘review-oriented objects’ of unmarked Themes with a material process through passive voice, reflecting the genre features. This type of pattern might provide the chance for professional writers to assess or review what academic pioneers in a certain scientific field have achieved or missed out. For example (the bold orange parts for review-related objects, the bold green parts for textual Themes and material processes through passive voice by underlined parts),

Physio 5.1 **In addition, GLP-1R agonists** are hypothesized to have pleiotropic effects on the cardiovascular system. (B) (the Published)

Cardio 5.1 **Subsequently, volatile anesthetics** were shown to protect myocardium against ischemic injury **when** administered 24 to 72 hours before (termed “delayed” or “late” preconditioning) or immediately after (known as “postconditioning”) prolonged coronary artery occlusion^{9, 10}. (B) (the Published)

Physio 5.2 **Autoantibodies that** bind to G-protein coupled receptors (GPCRs) of neuro-endocrine transmitters have been demonstrated to possess the potential to cause pathological changes in humans. (B) (the Published)

Sometimes, professionals may use review-oriented objects of unmarked Themes patterned with a relational process. In this way, they could state or evaluate the relevant research results concerning with review-oriented objects. This type of pattern may be represented in the following example (relational process by the underlined part).

Physio 5.3 **Agonistic β_1 AR autoantibodies** are also present in roughly a third of ischemic cardiomyopathy cases [8,15], **and** they are frequently associated with arrhythmic complications also in other diseases primarily not affecting the heart [16]. (B) (the Published)

Under many circumstances, students prefer to infuse review-oriented objects of unmarked Themes with a material process through active voice. In this pattern, they attempt to assess the possible role of review-oriented objects in the improvement of a medical syndrome. An example can be shown as follows (material process through active voice by the underlined part).

Cardio 5.2 Emulsified **isoflurane** can enhance the cardioprotection of St Thomas cardioplegia solution in an isolated heart I/R injury model in rats (5).
(B) (the Students')

Like professionals, students occasionally choose to combine review-oriented objects with a relational process in the Beginning sections, which usually suggest the possible function of review-oriented objects in a certain aspect of medical investigations. For instance (relational process by the underlined part),

Physio 5.4 Primary mesencephalic **neurons** are a good candidate source of DAergic neurons; however, human primary neurons are extraordinarily difficult to obtain, culture and handle. (B) (the Students')

5.1.1.2 Epistemic Nouns of Unmarked Themes

As indicated in Table 5.2, epistemic nouns in thematic positions are quite dominant in the Beginning sections of medical reviews. Frequent epistemic nouns of unmarked Themes employed by professionals and students normally involved nouns (with a minimum of two occurrences) such as *development*, *effect*, *evidence*, *experiments*, *mechanism*, *role*, *study*, and *studies*. In most cases, these epistemic nouns are followed by a material process with active voices (through verbs like *find*, *indicate*, *occur*, and *review*). In such a combination, professionals and students could better establish reasonable literature basis for their reviews. This type of pattern may be reflected as follows (the bold brown parts for epistemic nouns, the bold green parts

for textual Themes and active voice by underlined parts).

- Physio 5.5** **However**, several **studies** have found **that** the over expressing of the β 1AR was demonstrated to exacerbate damage to the heart and led to heart failure sooner than desensitized hearts alone [2].
(B) (the Students')
- Cardio 5.3** Comparative **experiments** indicated **that** the Ca^{2+} concentration in these microdomains reached at least 16 μM . (B) (the Published)
- Cardio 5.4** This beneficial **effect** occurred in conjunction with the preservation of high-energy phosphates. (B) (the Published)
- Cardio 5.5** **Thus**, the present **study** reviews the mechanisms of myocardial protection by isoflurane against I/R injury. (B) (the Students')

In addition, professionals might use epistemic nouns of unmarked Themes in combination with a material process through passive voice. In such a way, what previous studies have accomplished or missed out could be objectively spelled out in the Beginning sections. Examples can be represented in the following (the underlined parts for passive voice).

- Physio 5.6** *MM(R)Sal* was found to induce apoptosis in dopaminergic cells **and** the **mechanism** of the cell death was studied by use of human dopaminergic SH-SY5Y cells. (B) (the Published)
- Cardio 5.6** **While** the **role** of the ER as a physiologically important Ca^{2+} store was already universally recognized, a similar **role** for the mitochondria was for a long time still debated upon. (B) (the Published)

In comparison, students choose to employ epistemic nouns as unmarked Theme patterned with a relational process. Such a combination could be viewed as a reasonable explanation for some feasible steps or methods in certain areas of scientific investigation. An example is presented as follows (a relational process by the underlined part).

Physio 5.7 The **development** of a stable and reliable dopaminergic (DAergic) neuronal cell model is particularly necessary for studying the pathogenesis of PD and developing therapeutic strategies.
(B) (the Students')

5.1.1.3 Referred Studies as Unmarked Themes

In the Beginning sections, related scientific explorations are usually referred to or quoted by professionals and students when they conduct a literature review. 'Referred studies' as subject heads of unmarked Themes are frequently materialised by 'review-oriented objects' or 'epistemic nouns' linking with reporting verbs, which could highlight research outcomes in reviewed literature. Such patterns may reflect an objective way to overview what previous academic investigations have accomplished. Comparatively, professionals depend on more occurrences and varieties of verbs in the citing relevant studies. Cases of 'referred studies' in thematic positions could be shown in the following examples (the bold purple parts for referred studies, the bold green parts for textual Themes and others by the bold light blue; material processes through the underlined parts).

Cardio 5.7 **Kehl et al (4)** found **that** low concentration of isoflurane may have greater efficacy to protect myocardium during conditions of low coronary collateral blood flow. (B) (the Students')

Physio 5.8 **However, patients with T2DM** also demonstrate endothelial dysfunction and impairment vasodilatation [9], microvascular disease (particularly in the myocardial microcirculation [10-11], increased arterial stiffness [12], left ventricular hypertrophy [13], and cardiac fibrosis [14].
(B) (the Published)

Cardio 5.8 **In 1997, three research groups⁶⁻⁸** simultaneously reported **that** the administration of halothane or isoflurane before prolonged coronary artery occlusion and reperfusion reduced myocardial infarct size in vivo.
(B) (the Published)

Physio 5.9 **The preclinical studies by Martin and his colleagues** showed **that** Exendin-4 (Ex-4), a drug for T2DM, ameliorated abnormalities in peripheral glucose regulation and suppressed cellular pathology in both brain and pancreas in a N171-82Q mouse model of Huntington's disease. (B) (the Students')

On the other hand, referred studies of unmarked Themes may be materialised by reporting verbs through passive voice (like *find*, *propose* and *publish*). In this way, the achievements of some aspects of academic investigations could be objectively reviewed. For example (materialised processes by the underlined parts),

Physio 5.10 **Genes responsible for autosomal dominant and recessive juvenile parkinsonism** were found to be α -synuclein [55] and parkin gene [15], respectively. (B) (the Published)

Physio 5.11 **Three endogenous alkaloids** have been proposed as candidates of dopaminergic neurotoxins: derivatives of dopamine-derived 1-methyl-4-phenyl-1,2,3,4-tetrahydroisoquinoline (salsolinol, Sal) [52] and 1-benzyl catechol isoquinoline [6,7-dihydroxy-1-3,4'-dihydroxybenzyl]-1,2,3,4-tetrahydroisoquinoline, tetrahydropapaveroline, THP] [29], simple 1,2,3,4-tetrahydroisoquinolines [43], and β -carbolines [3, 4]. (B) (the Published)

Physio 5.12 **Many manuscripts investigating the effects of GLP-1 therapies in neurodegenerative diseases** have been published with very promising results, and may indicate an alternative approach for these patients (Luchsinger, 2012; Sakurai, 2011; Mossello et al., 2011; Bak et al., 2011; Harkavyi and Whitton, 2010). (B) (the Students')

5.1.1.4 Research Purposes of Unmarked Themes

Unmarked Themes construed by 'research purposes' as subject heads are only adopted by professionals in the Beginning sections. This type of unmarked Theme is mainly realised by *aim* and *purpose*, accompanied by a relational process through Verb-infinitive. Examples may be reflected as follows (the bold red parts for research purpose, the bold green parts for textual Themes and verb-infinitive relational processes through the underlined parts).

Cardio 5.9 The first **aim** of this review therefore is to provide a state-of-the-art view on the factors **that** determine the transfer of Ca^{2+} from IP_3 -sensitive Ca^{2+} stores to the mitochondrial matrix. (B) (the Published)

Physio 5.13 The **purpose** of this review is to summarize published preclinical and clinical studies on the cardiovascular effects of GLP-1R agonists and to assess the evidence as a whole. (B) (the Published)

5.1.2 Characterisation of Marked Theme

All marked Themes are construed by circumstantials in the Beginning sections, which might be demonstrated in Table 5.4. According to Table 5.4, circumstances of place, temporal location and manner are quite dominant in the sections of both published professional and students' draft medical reviews. However, professionals tend to employ more temporal location and manner circumstantials, whereas students prefer to depend on more circumstances of place in the sections. In addition, circumstances of reason and concession are absent in the sections of published professional reviews, while purpose circumstantial is not adopted by students.

Table 5.4 Cases of Circumstantial Marked Themes in the Beginning Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Place	5	33.33	7	41.18
Reason	---	----	1	5.88
Concession	---	----	1	5.88
Purpose	1	6.67	---	---
Temporal Location	5	33.33	5	29.41
Manner	2	13.33	2	11.76
Condition	1	6.67	1	5.88
Others	1	6.67	---	----

Both professionals and students frequently employ prepositional expressions with *in* to indicate place circumstantials. Sample cases of place circumstances as marked Themes are presented as follows (circumstantial place by the bold green parts

and the others by the bold brown part).

Cardio 5.10 **For these measurements**, they used ratiometric pericams, including a low-affinity version, inserted in an artificial ER-mitochondria linker; **in such experiments** they confirmed the locality high Ca^{2+} concentration at the interface. (B) (the Published)

Cardio 5.11 **In a dog cardiopulmonary bypass model**, researchers found that alternative use of isoflurane and propofol confers superior cardioprotection against postischemic myocardial injury and dysfunction (6). (B) (the Students')

Scarcely, professionals may use adverbs to represent circumstance of place as marked Theme. For example,

Physio 5.14 **Here**, we will review the current state of knowledge regarding these therapeutic and diagnostic aspects of the issue and try to give an outlook on further developments. (B) (the Published)

Given circumstances of temporal location, both professionals and students show the preference of using prepositional phrases as temporal marked Themes in the sections. This type of marked Theme may be typified in the following examples (the bold blue parts for temporal location).

Cardio 5.12 **Until now**, the protective effect of isoflurane against myocardial ischemia/reperfusion (I/R) injury has been reported in several studies. (B) (the Students')

Cardio 5.13 **To date**, the anti-ischemic effects of volatile anesthetics have been validated repeatedly in all mammalian species in which APC and its related forms were studied. (B) (the Published)

Physio 5.15 **Over the past three decades**, growing evidence has accumulated that a number of other aetiologies are probably based on the same pathogenic principle and therefore should also be recognized as agonistic GPCR-targeted autoantibody-disease. (B) (the Published)

Occasionally, students adopt adverbs to signify the temporal marked Themes. This feature could be manifested as follows.

Physio 5.16 **Recently**, significant advances have been made in the experimental studies of PD, especially through the use of cell models.
(B) (the Students')

Considering manner marked Themes in the Beginning sections, this type of marked Theme is normally characterised through prepositional phrases. For instance (the bold purple parts for circumstances of manner),

Cardio 5.14 **With the deterioration of the disease**, symptoms of heart failure appear eventually. (B) (the Students')

Cardio 5.15 **By using mitochondria-targeted aequorin** these authors demonstrated that inositol 1,4,5-trisphosphate (IP₃)-induced Ca²⁺ release (IICR) could in fact efficiently be transmitted to the mitochondrial matrix. (B) (the Published)

Physio 5.17 **From these observations** the postulate can be derived that patients, whose cardiac health is endangered by agonistic β₁AR autoantibodies, should be identified, monitored and subjected to specific therapies counteracting the adverse effects of the autoantibodies on cardiac function. (B) (the Published)

5.1.3 Patterns of Textual Theme

Table 5.5 Frequent Textual Themes in the Beginning Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Conjunctions	32	71.11	21	65.63
Conjunctive Adjuncts	13	28.89	11	34.38

Frequent textual Themes realised through structural conjunctions and conjunctive adjuncts in the Beginning sections are reflected in Table 5.5. In general, professionals use more textual Themes than students in the sections. Professionals

resort to a higher proportion of conjunctions while students prefer to depend on more conjunctive adjuncts in the sections. In terms of structural linkers, professionals and students frequently choose linkers such as *and*, *that*. Sample cases of these conjunction linkers may be represented as follows (conjunctions by the bold green parts and conjunctive adjuncts through the bold blue parts).

Cardio 5.16 The World Health Organization has reported **that** cardiovascular diseases (CVD) are the leading cause of death globally, **and** almost 23.6 million people will die from CVDs by 2030, mainly from myocardial infarction (1). (B) (the Students')

Cardio 5.17 **In fact**, the important role of mitochondria as bona fide Ca^{2+} stores **that** can take up Ca^{2+} under physiologically relevant conditions and so affect normal cellular Ca^{2+} handling is only generally recognized since the seminal work of Rizzuto and colleagues in the early nineties. (B) (the Published)

In addition, professionals tend to employ varieties of conjunction linkers than students in contributing to the cohesive property of the Beginning sections. In most cases, they may pattern a conjunction linker with another one or with a conjunctive adjunct in the sections. In comparison, these complex patterns of conjunctions are seldom employed by students. Textual Themes construed by various structural linkers could be characterised as follows.

Cardio 5.18 The beneficial effect was termed “anesthetic preconditioning” (APC), occurred independent of changes in systemic and coronary hemodynamics, and persisted **despite** discontinuation of the volatile anesthetic before coronary artery occlusion, a “memory” period similar to that observed during ischemic preconditioning (IPC). (B) (the Published)

Cardio 5.19 Such efficient transfer can occur **in spite of** the low Ca^{2+} affinity of the mitochondrial transport systems **when** IICR occurs very close to the mitochondria so that a local microdomain with a relatively high Ca^{2+} concentration is created near the mitochondria. (B) (the Published)

Physio 5.18 **However**, a targeted application of these concepts to the causal therapy or prevention of heart failure is currently hampered by diagnostic issues, **as** there are no available assays **that** are suitable for reliable quantification of β_1 AR autoantibodies in patient's blood samples or a standardised assessment of their impact on receptor function. (B) (the Published)

Physio 5.19 Amyloid-beta ($A\beta$), a most common pathological hallmark of AD, is accumulated as extracellular plaques in the gray matter of the brain in AD, **while** in T2DM islet amyloid polypeptide (IAPP) is accumulated in the pancreas. (B) (the Students')

Physio 5.20 **Because** neurons more rely heavily on glucose metabolism than other cell types, bioenergetic deficits are considered a common cause of neurodegenerative diseases. (B) (the Students')

With respect to conjunctive adjuncts, professionals normally adopt those adjuncts like *in addition, for example, subsequently* while students prefer to use *moreover, furthermore, therefore, thus* etc.

5.1.4 Features of Interpersonal Theme

Professionals are inclined to use different ways to construe interpersonal meanings in thematic positions in reviewing relevant research in the Beginning sections. It is found that interpersonal Themes are usually realised by professionals through mental verbs (*think* and *believe*). For example (the bold red parts for interpersonal Themes and the bold green parts for textual ones),

Cardio 5.20 **It was therefore thought** that loading of the mitochondria with Ca^{2+} primarily occurred under non-physiological or even pathophysiological conditions in which the cytosolic Ca^{2+} concentration was elevated well-above normal values. (B) (the Published)

Physio 5.21 PD was once considered to be a form of accelerated aging, **but it is now believed** that pathological process other than aging is involved in PD, **because** the regional selectivity of dopamine depletion in the substantia nigra is different in PD from aging. (B) (the Published)

Sometimes, professionals choose adverbs to represent interpersonal meanings in thematic positions in the sections. This type of interpersonal Theme might be shown as follows.

Physio 5.22 **Uniquely**, GLP-1R agonists exert coordinated effects on mechanisms of glucose release and nutrient uptake, suppress inappropriately elevated glucagon secretion, slow gastric emptying, and increase satiety with the net result of reduced body weight.
(B) (the Published)

In contrast, interpersonal Theme in the sections of students' draft reviews is construed only by adverbs, which may be indicated in the following example.

Physio 5.23 **Indeed**, the new strategies are being developed to inhibit pathologic hallmarks, such as the use of the incretin hormone glucagon-like peptide-1 (GLP-1) as a new treatment for AD, PD, and other neuroprotective diseases. (B) (the Students')

5.1.5 Structures of Thematised Comment

As reflected in Table 5.1, a higher proportion of thematised comment is adopted by professionals in the Beginning sections. Moreover, professionals could better employ some particular structures for thematising what they are about to review in relevant literature background. In the first sense, both professionals and students normally structure the thematised comments by subject *it* with linking verbs and comment adjectives. In this way, they could politely state the likelihood and priority of performing certain aspects of scientific explorations. This type of thematised comment can be represented in the following examples (the bold red parts for thematised comment and the bold green parts for textual Themes).

Cardio 5.21 **It is now known** that the mitochondrial Ca^{2+} concentration is a crucial factor, not only for regulating mitochondrial function, but also for determining cellular fate, including life or death decisions.
(B) (the Published)

Cardio 5.22 **Since** several studies have found **that** isoflurane plays a role in the myocardial protection against I/R injury, **it's beneficial** for patients with I/R injury to investigate the mechanism. (B) (the Students')

Another common way to organise comments in thematic position is to structure them by subject *it* and linking verbs and adjective *possible*. Thematized comments structured in this way may directly predict the possibility of a certain aspect of academic investigations, which is adopted only by professionals in the sections and might be reflected as follows.

Physio 5.24 **Therefore, it is currently not readily possible** to select patients for specific antibody-targeted therapies and to monitor such therapeutic regimen in clinical setting. (B) (the Published)

Quite often, when making comments in thematic positions, professionals tend to organise the comments by subject *it* with linking and mental verbs (passive voice). Thematized comments structured in this pattern could indirectly and tactfully claim the probability of research results or feasibility of expected investigations. For example,

Physio 5.25 **It is estimated** that agonistic β_1 AR autoantibodies could be involved in up to 10% of cardiac morbidity in western societies. (B) (the Published)

Physio 5.26 **It is suggested** to classify such clinical entities as GPCR-targeted agonistic autoantibody-diseases. (B) (the Published)

Finally, professionals may depend on comments in thematic position to strengthen the possible likelihood of an aspect of academic investigations. This type of thematized comment is structured by subject *it* and modal verbs (*must*) with linking and mental verbs, which could be demonstrated in the following example.

Physio 5.27 **It must be finally noted** that depending on the detection method deployed agonistic β_1 AR autoantibodies can be also determined in up to 12% of healthy individuals. (B) (the Published)

On the other hand, students prefer to structure comments in thematic position through subject *it* with reporting verbs. In such a way, they attempt to review or assess the possible role of aspects of scientific research, which has been recognised and approved. This type of comments may be represented as follows.

Physio 5.28 **It has been approved** that insulin receptors are desensitized in the brains of AD patients, and the impairment of insulin signaling pathway in the brain could play a role in the development of AD (Holscher, 2011; Liu et a;., 2011), **as** it leads to activation of glycogen synthase kinase-3 β (GSK-3 β), an important component of insulin signaling pathway and a key tau kinase in the brain. (B) (the Students')

5.2 Patterns of Thematic Structures in the Concluding Sections of Medical Reviews

Table 5.6 Frequent Theme Types in the Concluding Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Unmarked Theme	79	51.30	24	55.81
Marked Theme	5	3.25	8	18.60
Textual Theme	58	37.66	10	23.26
Interpersonal Theme	5	3.25	---	---
Existential 'There'	2	1.30	---	---
Thematised comment	5	3.25	1	2.33

In the current section, patterns of thematic structures in the Concluding sections of medical reviews will be approached. Table 5.6 indicates Theme types frequently occurred in the sections. As shown in Table 5.6, unmarked Theme has its dominance in the Concluding sections of both published professional and students' draft reviews. However, professionals tend to employ a higher proportion of unmarked

and textual Themes while students prefer more marked Themes in the sections. Moreover, professionals are inclined to adopt more comments in thematic position in the Concluding sections. In the concluding parts of review genre, interpersonal Theme is absent in students' draft ones.

5.2.1 Features of Unmarked Theme

Table 5.7 Cases of Subject Heads as Unmarked Themes in the Concluding Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Review-oriented objects	24	31.58	11	47.83
Referred authors	1	1.32	---	---
Authors	1	1.32	---	---
Referred studies	5	6.58	---	---
Reference	2	2.63	---	---
Epistemic nouns	43	56.58	12	52.17

Types of subject heads as unmarked Themes in the Concluding sections of are represented in Table 5.7. As indicated in Table 5.7, 'review-oriented objects' and 'epistemic nouns' of unmarked Themes are quite dominant in the sections. However, professionals employ a higher frequency of 'epistemic nouns' and 'review-oriented objects' of unmarked Themes while students choose only two types of heads for unmarked Themes in the Concluding sections. In terms of genre feature for medical reviews, 'referred studies' as unmarked Themes are only present in the sections of published professional reviews.

5.2.1.1 Epistemic Nouns of Unmarked Themes

Unmarked Themes realised through heads of epistemic nouns in the Concluding sections are normally involved in the nouns such as *assays, data, evidence, models, results, review* and *studies* (with a minimum of two occurrences). In reviewing the relevant literature concerning achievements or breakthroughs in scientific explorations, these epistemic nouns may contribute to the grounded account and expression of the speaker's evaluated opinions.

Under most circumstances, epistemic nouns are usually patterned with both relational and material processes in the sections. Patterns structured in such a way may be due to the characterisation of review genre. In the Concluding sections of reviews, the common goal is normally to summarise and review what previous studies have achieved or missed and also to predict what the orientation of future academic investigations would be. It is for this goal that both material and relational processes are needed to be combined with epistemic nouns. Patterns of epistemic nouns as unmarked Themes could be typified as follows (the bold blue parts for epistemic nouns, textual Themes by the bold green parts and material and relational processes through underlined parts).

Physio 5.29 Epidemiological **studies** on the enzyme in lymphocytes are now on the way to find out subjects with high risk factors among normal control **and** future **studies** will lead us to find preventive methods for PD using this peripheral marker. (C) (the Published)

Cardio 5.23 Some **evidence** of clinical myocardial protection using acute APC has been presented, **but** these **data** are less convincing than the findings from studies **in which** a volatile anesthetic was administered continuously throughout cardiac surgery. (C) (the Published)

Alternatively, professionals tend to pattern epistemic nouns only with a material process in the sections. In this way, they could argue, assess or probablise the

aspects of scientific explorations in this final stage of their reviews. This type of pattern can be reflected in the following (material processes indicated by underlined parts).

Cardio 5.24 Other Commonly used experimental **models** may use other end points to quantify damage, **but** these **models** share the common feature **that** the heart or its cellular constituents are exposed to profound ischemic, hypoxic, or anoxic insult followed by reperfusion or reoxygenation.
(C) (the Published)

Cardio 5.25 The **results** of these clinical trials and meta-analyses support the hypothesis **that** the use of a volatile anesthetic during cardiac surgery may be associated with a reduction in myocardial necrosis and relative preservation of postoperative LV function compared with the intravenous anesthetic technique. (C) (the Published)

5.2.1.2 Review-oriented Objects as Unmarked Themes

Unmarked Themes construed are construed by only a few 'review-oriented objects' in the Concluding sections. Most of these review objects for unmarked Themes are adopted by professionals. Frequent review-oriented objects as heads of unmarked Themes employed by professionals and students can be categorised in the following list (with a minimum of two occurrences).

In the Concluding Sections of Medical Reviews

amount of myocardium, SH-SY5Y cells, peak troponin I and T concentrations, volatile anesthetics

Review-oriented objects as heads of unmarked Themes in the sections are frequently accompanied by relational or material processes. In such a way, professionals and students may attempt to emphasise the current situation of the reviewed scientific phenomenon at the concluding stage. They may then form their own evaluation and opinions towards the achievements and deficiencies in some aspects of academic investigations. For example (the bold blue parts for unmarked Theme, textual

Theme by the bold green part and relational and material processes by underlined parts),

Physio 5.30 Differentiated and undifferentiated **SH-SY5Y cells** have gained broad acceptance as models of DAergic neurons for PD research. Some differentiated **SH-SY5Y cells** are more suitable PD cell models than others, **because** they stop proliferating, have more DAergic neuronal properties, and have similar susceptibility to neurotoxins and neuroprotective agents as primary neurons. (C) (the Students')

Cardio 5.26 **First, volatile anesthetics** substantially alter the determinants of myocardial oxygen supply and demand through their direct and indirect effects on systemic, pulmonary, and coronary hemodynamics and autonomic nervous system activity in a dose-related manner. (C) (the Published)

In addition, professionals may employ the pattern of review-oriented objects as unmarked Themes followed by a material process through passive voice in the sections. In this way, they would produce more convincing explanations concerning a phenomenon by citing relevant explorations. This pattern can be characterised as follows (the underlined part for the material process).

Cardio 5.27 **For example, peak troponin I and T concentrations** of approximately 6 and 1 ng/mL, respectively, were reported 24 hours after elective CABG in patients anesthetized with propofol^{32,65}. (C) (the Published)

5.2.1.3 Referred Studies of Unmarked Themes

According to Table 5.7, 'referred studies' as subject heads of unmarked Themes are only used by professionals in the Concluding sections. It seems necessary to employ this type of unmarked Theme when drawing conclusions on what have been reviewed in the sections. Unmarked Themes construed by 'referred studies' in the Concluding sections are normally accompanied by material processes through passive voice (verbs like *demonstrate*, *report* and *show*). In this patterning, professionals could come to conclusions, which may sound more arguable and persuasive. This type of

unmarked Themes could be shown in the following examples (the bold brown parts for referred studies, textual Theme by the bold green part and the bold purple part for interpersonal Theme; material processes indicated by underlined parts).

Cardio 5.28 **Indeed, advanced age⁸⁹⁻⁹¹, cardiomegaly⁹², obesity⁹³, and hyperglycemia²⁵ in the presence⁹⁴ or absence⁹⁵ of diabetes mellitus** have been shown to attenuate or abolish APC in experimental animals.
(C) (the Published)

Physio 5.31 **The toxicity of THP to dopamineneurons** was demonstrated by in vivo experiments [9, 16]. (C) (the Published)

Physio 5.32 **In addition to NM (R)Sal**, several **endogenous alkaloids** were reported to be related to the pathogenesis of PD.
(C) (the Published)

Sometimes, professionals prefer to pattern 'referred studies' of unmarked Themes with material processes by means of active voice. In reviewing what previous relevant research has achieved, professionals need to adopt 'quoted studies' of unmarked Themes to state the impact of a certain aspect of research outcome. For example (the underlined part for the material process),

Cardio 5.29 **Peak and sustained troponin I and T release** clearly predict infarct size, LV dysfunction, and long-term clinical outcome in patients with acute ST-segment elevation myocardial infarction after an occluded coronary artery was reperfused in the cardiac catheterization laboratory.^{97,98} (C) (the Published)

5.2.2 Structures of Marked Theme

Circumstances of marked Themes in the Concluding sections are in lower frequency. As reflected in Table 5.8, there are four types of circumstantial marked Themes present in the sections. To achieve textual prominence in the Concluding sections, professionals depend on circumstances of temporal, manner and condition, whereas students resort to place and temporal circumstantials.

Table 5.8 Cases of Circumstantial Marked Themes in the Concluding Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Place	---	---	1	33.33
Temporal Location	2	40.00	2	66.67
Manner	1	20.00	---	---
Condition	2	40.00	---	---

In most cases, circumstances of marked Themes are realised by prepositional phrases in the sections. Marked Themes construed in this way could be exemplified as follows (the bold green parts for place, temporal location by the bold red parts, the bold blue parts for manner, and the bold orange part for condition).

Cardio 5.30 **In the future**, the inhibition of mitochondria-mediated apoptotic will be a key target in the treatment of cardiovascular disease.
(C) (the Students')

Cardio 5.31 **In the mechanism of the cardioprotection**, isoflurane could act as trigger or mediators. (C) (the Students')

Physio 5.33 **Considering that apoptosis is a common death form in parkinsonian brain**, the reduced form of these alkaloids seem to be more appropriate neurotoxins to induce apoptosis in dopamine neurons in the substantia nigra after a long-term accumulation.
(C) (the Published)

Cardio 5.32 **From this latter perspective**, guidelines advocating the use of volatile anesthetics for myocardial protection in patients at risk of myocardial ischemia may be somewhat difficult to justify.^{86,87}
(C) (the Published)

Very seldom, professionals prefer to employ adverbs as circumstances of temporal location in the Concluding sections. This structure is characterised in the following example.

Physio 5.34 **Recently**, we found that THP induced necrosis in SH-SY5Y cells, whereas papaveroline induced apoptosis [29]. (C) (the Published)

5.2.3 Features of Textual Theme

Table 5.9 Frequent Textual Themes in the Concluding Sections of Medical Reviews

Types of Theme	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Conjunctions	42	72.41	9	81.82
Conjunctive Adjuncts	16	27.59	2	18.18

As indicated in Table 5.9, textual Themes in the Concluding sections of are in the lower position of its frequency. In general, there are more conjunctions than adjuncts in the sections. Comparatively, professionals employ a higher frequency and varieties of both conjunction linkers and adjuncts in the Concluding sections. With regard to conjunctions, linkers such as *because*, *that* and *which* are frequently employed by professionals, which sometimes may be combined with conjunctive adjuncts. These conjunctions are normally used as linkers to elicit the possible influences out of relevant studies or to state possible reasons for types of scientific phenomena. Examples could be shown as follows (the bold green parts for conjunctions and conjunctive adjuncts by the bold blue parts).

Cardio 5.32 **Conversely**, the general consensus of clinical data suggests **that** the use of a volatile anesthetic may be associated with a reduction in myocardial necrosis and modest short-term benefits, **even when** only a relatively small amount of myocardium is at risk.
(C) (the Published)

Cardio 5.33 **Similarly**, maintenance of coronary perfusion pressure with intravenous fluids or vasoactive drugs during changes in cardiac position and use of intracoronary shunts to provide continuous coronary blood flow during construction of distal anastomoses are common techniques **that** also serve to maintain global and regional myocardial integrity during OP-CAB or MIDCAB surgeries. (C) (the Published)

Physio 5.35 **However**, the cytotoxicity of this isoquinoline to dopamine neurons has not been confirmed [38], **which** is compatible with our results. (C) (the Published)

Cardio 5.34 This is the case **because** systemic and topical hypothermia, intermittent or continuous administration of antegrade and retrograde cardioplegia, and myocardial decompression are used routinely to minimize global ischemic damage during cardiopulmonary bypass in patients undergoing conventional CABG or valve surgery. (C) (the Published)

5.2.4 Structures of Interpersonal Theme

Interpersonal Theme is absent in the Concluding sections of students' draft reviews. It is found that professionals usually adopt adverbs to represent interpersonal meanings in thematic positions. In some cases, these adverbs may be taken as reflecting the speaker's writing tone for confirmation. Most frequently, these interpersonal Themes are patterned with material processes through passive voice. For example (the bold blue parts for interpersonal Theme, textual Theme by the bold green part and material processes by the underlined parts),

Cardio 5.35 **Notably**, few data have been presented to date directly indicating **that** the use of a volatile anesthetic improves long-term outcome or reduces the incidence of major adverse cardiac events in patients undergoing cardiac surgery. (C) (the Published)

Cardio 5.36 **Indeed**, postoperative peak troponin T concentrations less than 1.6 ng/ml were shown to be highly predictive of the absence of major adverse cardiac events after CABG. (C) (the Published)

At other times, professionals may employ adverbs to indicate the possibility of a certain aspect of the reviewed-oriented objects. This feature may be typified in the following example.

Physio 5.36 **Possibly**, that dual diagnostic goal will be best reached by a staged strategy. (C) (the Published)

Occasionally, professionals might use a particular pattern with subject *it* and a relational process to strengthen the conformational state of mind towards the reviewed object. This pattern can be characterised as follows.

Physio 5.37 **It is the firm belief of the authors** that valid, standardised diagnostic tests for agonistic β_1 AR autoantibodies will substantially promote further development and evaluation of personalised therapeutic strategies specifically directed at clearance or neutralisation of distinct β_1 AR antibody species that prove to be cardio-noxious in a given patient or disease-entity. (C) (the Published)

5.2.5 Characterisation of Thematised Comment

Table 5.6 shows that more occurrences of thematised comments are adopted by professionals in the Concluding sections. Under some circumstances, structures of comments in thematic positions are used to represent the speaker's confirmative assessment of a certain scientific phenomenon. This type of comments in thematic positions could better meet the needs for characterising the review genre, especially at the conclusive stages. Patterns of thematised comments for this purpose may be reflected as follows (the bold orange parts for thematised comment and textual Theme by the bold green part).

Physio 5.38 **It is in contradiction to the previous observation** that the oxidized toxins, DMDHIQ⁺, MPP⁺, and 2,9-dimethylnorharmaniumion, induce necrosis, rather than apoptosis, by the rapid inhibition of mitochondrial Complex I and ATP synthesis. (C) (the Published)

Cardio 5.37 These changes contribute to reductions in myocardial oxygen consumption and ischemic burden under controlled conditions, **but it is also true** that such beneficial effects may be offset or overwhelmed in patients who are subjected to the profound stress of cardiac surgery in the presence or absence of exposure to cardiopulmonary bypass. (C) (the Published)

On the other hand, thematised comments could be employed to predict the likelihood of some aspects of scientific investigations. For example,

Cardio 5.38 Several proteins are directly or indirectly involved in the regulation of this process, **but it appears** that the structural links existing between IP₃-sensitive Ca²⁺ stores and the mitochondria are crucial for proper mitochondrial function. (C) (the Published)

Physio 5.39 **It poses a major challenge for future development** to move the assessment of circulating agonistic β₁AR autoantibodies from research procedures to clinical diagnostics, and to develop assays that accomplish the requirements of standardisation and reliability of clinical diagnostic testing. (C) (the Published)

Physio 5.40 **It could be** a potential neuroprotective agent and our current findings may offer certain clues for optimizing its application in future. (C) (the Students')

5.3 Concluding Remarks

This chapter examined thematic structures in the Beginning and Concluding sections of medical reviews. Patterns of thematic choices in these two sections were signified. In the Beginning sections, unmarked, textual and marked Themes are the most dominant types of Theme. Both professionals and students depend on a similar proportion of unmarked and textual Themes to structure textual interaction with external world. However, the difference arises in that professionals choose to employ more thematised comment and interpersonal Theme, while students prefer to use a higher proportion of marked Theme in the sections.

Considering subject heads for unmarked Themes in the Beginning sections, both professionals and students tend to adopt a higher proportion of review-oriented objects, epistemic nouns and referred studies as unmarked Themes. However, professionals resort to a higher portion of epistemic nouns as unmarked Themes while students are inclined to use more review-oriented objects and cited studies for

unmarked Themes in the sections. Another contrast arises when students neglect claiming the review purpose in the Beginning sections.

It is found that all marked Themes are realised by circumstantials in the Beginning sections. Place, temporal location and manner circumstantials are quite dominant. However, professionals prefer to employ more circumstances of temporal location and manner, while students prefer to use more place circumstantials in the sections. Apart from this, professionals choose to omit circumstances of reason and concession, whereas students purpose circumstantial is absent in the Beginning sections of students' draft reviews.

In organising chunks of texts at the Beginning sections, professionals and students use the similar proportion of conjunctive adjuncts. However, professionals adopt a higher proportion of conjunction linkers and complicated patterns to achieve the linking and cohesive functions in the review genre.

Professionals choose different ways to structure interpersonal meanings in thematic positions in reviewing relevant medical research in the Beginning sections. It is found that professionals show the capacity of using various and particular structures in organising thematised comment in the sections. In contrast, students seem to adopt quite limited structures and patterns for interpersonal and comment aspects of meanings in thematic positions.

In comparison, greater difference arises in the Concluding sections of medical reviews. At the final stage of the review genre, students seem to experience some difficulties in structuring textual interaction and in bringing about the cohesive property of the sections. In the first sense, students adopt lower frequency of unmarked

and textual Themes. Moreover, they lack the awareness of employing interpersonal meanings in thematic positions at the concluding stage. With regard to types of subject heads for unmarked Themes, 'referred studies' as heads for unmarked Themes are not employed by students in the genre. In particular, students employ lower frequency of 'review-oriented objects' and 'epistemic nouns' for unmarked Themes.

In linking large parts of texts, students use quite lower frequency of both conjunctions and conjunctive adjuncts than professionals in the Concluding sections of reviews. As far as thematised comment is concerned, students still demonstrate the lower capability in dealing with variety and complicatedness for comment structures in thematic position at the concluding sections. All these findings concerning with thematic choices in review genre may offer some useful guidelines and orientation for future reforms in writing pedagogy and curriculum design, which will be discussed in Chapter Eight.

Chapter Six Evaluative Linguistic Resources in Medical RAs

6.1 Investigating Interpersonal Resources in Medical RAs

Chapter six will deal with evaluative language construed through interpersonal resources in the genre of medical RAs, including both published professional and students' draft medical ones. The frameworks of examining evaluative linguistic resources in this thesis will concentrate mainly on those mapping intersubjective stances for subset of Engagement and grading value relationship for Graduation within Appraisal system. Particularly, the analytical framework for Engagement subcategory will not be entirely grounded on that illustrated in Appraisal system. Engagement is to be remodeled in order to unfold the interpersonal features in medical discipline for this study. In the following sections, analytic frameworks for Engagement and Graduation subcategories are to be presented. In addition, respective features for each subset within Appraisal system are to be handled.

6.1.1 A New Model for Exploring Engagement Resources

Locating within Systemic Functional Linguistics, Appraisal theory is comprised of three subcategories offering linguistic alternatives for language users 'in terms of how they appraise, grade and give value to social experience' (Coffin, 2002: 509). These subsystems in Appraisal system involve Engagement, Attitude and Graduation (Martin and White, 2008). Attitude system comprises three semantic areas concerning with Affect, Judgment and Appreciation (Martin and White, 2008). Language resources in Affect area mainly deal with 'appraising experience in affective terms and indicating the emotional effect of an event' (Coffin, 2002: 509). Judgment

can also handle 'meanings which serve to appraise human behaviour', but achieving this effect 'by reference to a set of institutionalized norms about how people should and should not behave' (Coffin, 2002: 509). As for Appreciation, it is mainly concerned with 'valuing [social] processes and products rather than behaviour' (Coffin, 2002: 509).

With respect to Engagement system, it normally involves in managing dialogism (Painter, 2003) for negotiation, emphasising the meaning construed from the perspective of text as being heteroglossic and intertextual (White, 2001; Martin and White, 2008). Under this Engagement model, the occurrence of meaning construal within a text is in a social context, where 'prior utterances, alternative viewpoints and anticipated responses' could be made (Martin and White, 2008: 97). In a simpler sense, rhetorical resources of Engagement construe meanings in varied ways in text, through which writer's intersubjective stance is modeled (White, 2001). The intersubjective positioning within Engagement category involves both monoglossic bare assertion and heteroglossic alternatives (Martin and White, 2008). Coffin (2002) specifies Engagement system as follows:

Engagement is a set of resources which enable a writer (or speaker) to either take up a position whereby their audience is construed as sharing the same, single worldview (Monogloss) or, on the other hand, adopt a stance which explicitly acknowledges diversity with its implication for conflict and struggle among diverse voices (Hetergloss).

(Coffin, 2002: 510)

Heteroglossic resources for construing various stance meanings within the Engagement taxonomy outline shown in Figure 6.1 may have two different orientations, which can be categorised as 'dialogical contraction' or 'dialogical expansion' (Martin and White, 2008: 102). Dialogical contraction falls on the degree 'to which an utterance acts to challenge, fend off' or restrict the scope of' other potential alternatives, whereas

dialogic expansion refers to the degree ‘to which an utterance actively makes allowances for dialogically alternative positions and voices’, opening up the dialogic space for contrary positioning (Martin and White, 2008: 102). Dialogic contraction incorporates ‘Disclaim and Proclaim’, while ‘Entertain and Attribute’ falls under dialogic expansion (Martin and White, 2008: 97-98). Types of heteroglossic diversity for Engagement category are reflected with examples in Figure 6.1.

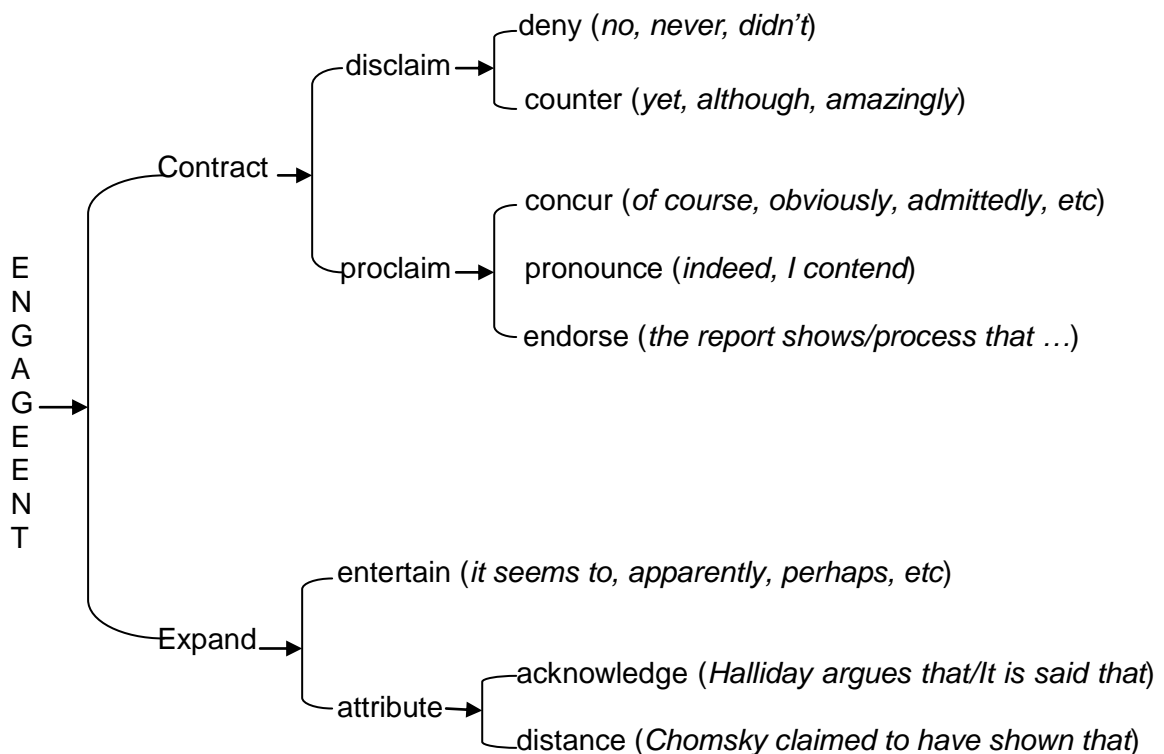


Figure 6.1 Engagement System in Appraisal

(Reproduced from Martin and White, 2008: 134)

It is worth noting that as a primary resource for construing heteroglossic diversity within Engagement subset, the grammatical realisation of modality may ‘signal that meaning is contingent and subject to negotiation’ (Coffin, 2002: 510). In this sense, the rhetorical property of modality under Engagement lies in that it brings ‘explicit negotiability into a proposition’ (Coffin, 2002: 510), directly invoking the potential of interaction between writers and readers (White, 2001).

Under the Engagement model produced by Martin and White (2008), contractive proclaiming comprises three subcategories, which include concurrence, pronouncement and endorsement. By examining sample data in this study, it is found that cause-effect proclaiming frequently occurs in medical RA and review genres. In this way, medical professionals and students could proclaim valid and well-founded propositions within texts. On the other hand, expansive entertain in previous model involves deductive formulation and linguistic forms representing probabilities. Based on sample data analyses, the cover term of modality (modalisation and modulation) may, to some extent, comprehensively reflect the genre characteristic of medical texts. Finally, expansive attribution formerly incorporates distancing and acknowledging. Considering genre features of medical writings, they may suggest that academics need to persuade readers in presenting and interpreting their research findings, trying to establish writer-reader alignment in text. From this perspective, distancing and acknowledging within attribution subcategory may seem to be neutral terms, which might not be suitable for data analysis in scientific explorations. On the other hand, citation/quotation could be seen as indicating a degree of distancing or acknowledging, but it may bring about credibility, contributing to persuasive effects in text.

According to the aforementioned account, Appraisal framework was developed with its focus mainly on secondary school narrative, journalism, legal discourse and popular science. From this departure, the existing analytical framework for Engagement resources within Appraisal system have its restrictions and may not fully unpack the interpersonal features for disciplinary register of medical writings. To accommodate to the analytical needs for this study, a new model of Engagement framework is proposed to be reestablished, which is extended with some basics drawing on Appraisal theory (White, 1998; Martin and White, 2008) and the others

added parts will follow Lee (2008).

Similarly to Martin and White's Engagement model, the new Engagement model consists of five subcategories, which involve Bare assertions; Disclaim (denial and countering); Proclaim (concurrence, pronouncement, causal relations and endorsement); Entertain (deductive formulations, e.g., *it seems, the evidence suggests*, and modality by means of modalisation and modulation); Attribute (citations/quotations). Among these five categories, three new elements are added following Lee (2008), which involve proclaim cause relations, entertain modality and attribute citation/quotation.

Since Lee's study (2008) focuses on analysing interpersonal resources in argumentative/persuasive essays written by students at tertiary level, genre features in her exploration shares with those in my research. In this sense, borrowing Lee's (2008) revised Engagement model, which is based on Martin and White's original one (2008), may be helpful and suitable for Engagement remodeling in this thesis. It is argued that this new model could better uncover the feature of dialogism in medical texts, which may be realised through monoglossic and heteroglossic stances. Demonstration of the new model of Engagement is represented in Figure 6.2. Altogether eleven categories consisting of the new model for Engagement dimension are listed with examples (from the data in this thesis and marked by the bold italicised parts) in the following.

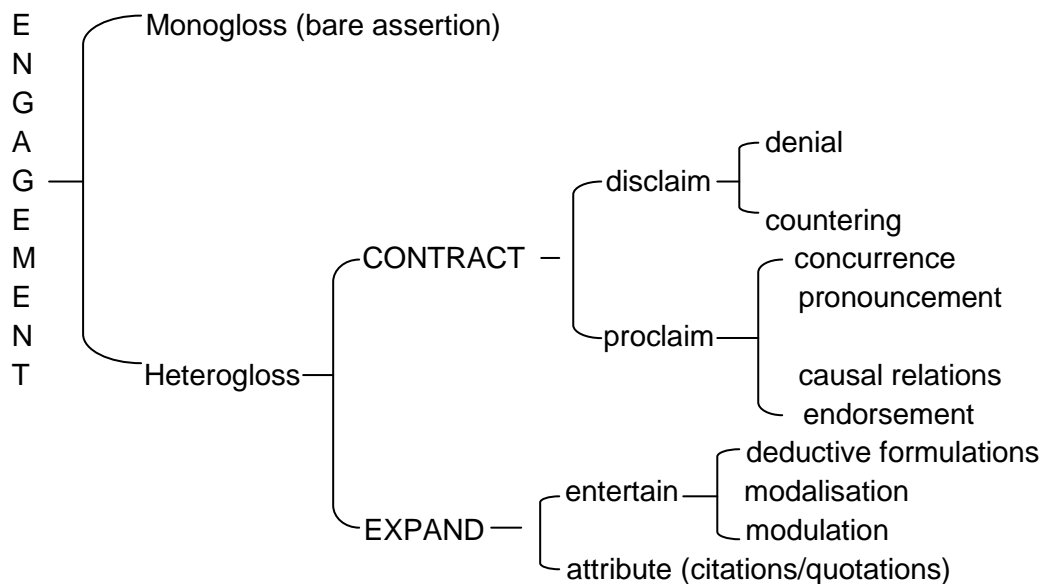


Figure 6.2 The New Model of Engagement Subset

- ◆ Bare Assertion: Alzheimer’s disease (AD) is the most common cause of dementia in the elderly population, characterized by progressive cognitive dysfunction.
- ◆ Disclaim/Denial: Secondly, there is **no** distinct evidence that midazolam could abolish the protective effect of isoflurane precondition.
- ◆ Disclaim/Countering: **However**, in the case of intense or prolonged ER stress, the UPR will eventually result in cell death, typically apoptosis.
- ◆ Proclaim/Concurrence: **Indeed**, activation of both is critical to induce long-term potentiation (LTP) in the hippocampal CA1 region.
- ◆ Proclaim/Pronouncement: **Therefore, we suggest** that the dopamine/cAMP pathway leading to DARPP-32 phosphorylation is associated with dysregulation of a sensorimotor gating function, as indicated by changes in PPI in NVH-lesioned rats.
- ◆ Proclaim/Causal relations: During CPB, ischemia/reperfusion injury is inevitable, **because** most of the hearts have to be arrested thus experiencing a period of ischemia, and then must be reperfused.
- ◆ Proclaim/Endorsement: **Recent data show** that expression of human CRP in mice accelerates aortic atherosclerotic lesion progression, thus providing evidence that CRP is an active player in atherogenesis *in vivo*.
- ◆ Entertain/Deductive formulations: Taken together, **our observations suggest** that NVH-lesioned rats represent a useful model in which to test cognitive enhancers as schizophrenic therapeutics.
- ◆ Entertain/Modality (Modalisation): Thus, pretreatment with isoflurane **may probably** aggravate oxidative damage by increasing free radical release.

- ♦ Entertain/Modality (Modulation): We cannot randomly choose a time point or just use the end point of the measurement, which **would** wither enlarge or reduce the difference between groups, and result in misleading conclusion.
- ♦ Attribute/Citations (Quotations): Acetylcholinestrerase activity has been reported to be altered in Alzheimer disease patients (Rinne et al., 2003).

6.1.2 Dimension of Graduation in Appraisal System

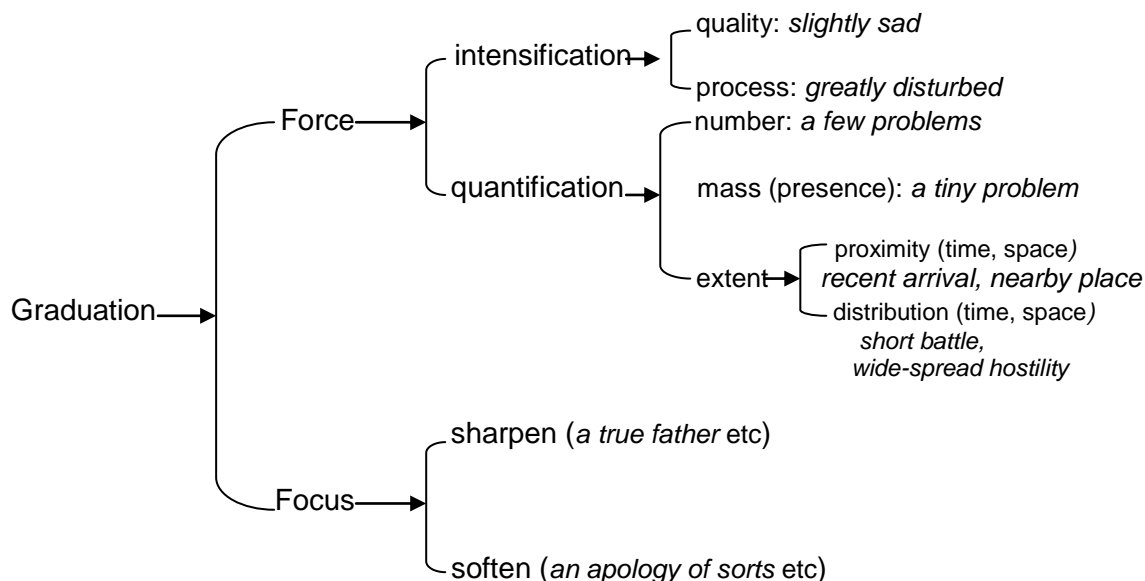


Figure 6.3 Graduation Category in Appraisal System

(Reproduced from Martin and White, 2008: 138, 141)

Within Appraisal system, Graduation is another subsystem comprised of resources concerning with ‘up-scaling and down-scaling’ semantic meanings (Martin and White, 2008: 135), which in other words, can indicate ‘turning the volume up or down’ for ‘grading evaluation’ (Coffin, 2002: 509). Graduation may operate on interpersonal force of ‘intensity’ such as *very*, *really*, *extremely*, etc, or may be used for ‘quantification’ (e.g. *many miles*, *large amount*, etc) which is under the subcategory of Force (Martin and White, 2008: 140-141). On the other hand, Graduation can also be employed to ‘sharpen or blur’ the degree of boundary of membership category exemplifying a valuer relationship (such as *kind of*, *effectively*, *a true friend*, etc), which

is referred to as Focus (Martin and White, 2008: 137-138; White, 2001). An outline of Graduation category within Appraisal framework is presented in Figure 6.3.

6.2 Construing Intersubjective Positioning in the Introductions of Medical RAs

The employment of interpersonal resources for evaluative meanings in the genre of medical RAs will be approached in this chapter. Linguistic resources for construing Engagement subset within the Appraisal system will be handled in the first place. Following this, patterns of Graduation subsystem is also to be dealt with. Findings out of data analysis for Engagement and Graduation subcategories will be presented in the following sections.

6.2.1 General Patterns of Engagement in the Introductions of Medical RAs

In the present section, rhetorical properties of alternative meanings through patterns of engaging positioning and stances within heteroglossic context in the Introductions of both published professional and students' draft medical RAs are explored. Based on data analysis, general patterns in the configuration of intersubjective stances by medical professionals and students in the Introduction sections of medical RAs will be revealed.

As demonstrated in Table 6.1, both medical professionals and students employ more heteroglossic alternatives for engaged dialogistic positioning than monoglossic positive assertions in the Introduction sections. However, medical students tend to adopt more bare assertions in the Introductions. From this, it seems that medical students are more likely than professionals to avoid the possibility of other heteroglossic options, thus making an assumption of homogeneity within an academic

community.

Table 6.1 Engagement Resources in the Introductions of Medical RAs

Engagement Resources	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Monogloss	15	10.95	25	13.08
Bare assertion	15	10.95	25	13.08
Heterogloss	122	89.05	166	87.01
CONTRACT	78	56.93	97	50.88
Disclaim	24	17.52	27	14.13
denial	9	6.57	13	6.80
countering	15	10.95	14	7.33
Proclaim	54	39.41	70	36.75
concurrence	1	0.73	1	0.52
pronouncement	48	35.03	52	27.23
causal relations	2	1.46	5	2.62
endorsement	3	2.19	12	6.28
EXPAND	44	32.12	69	36.13
Entertain	23	16.79	42	21.99
deductive formulations	6	4.38	5	2.62
modalisation	14	10.21	36	18.85
modulation	3	2.19	1	0.52
Attribute	21	15.33	27	14.14
citations/quotations	21	15.33	27	14.14

Greater differences arise when it comes to heteroglossic diversity reflected in the beginning parts of medical RAs. In the first place, there are more occurrences of

heteroglossic contraction than expansion in the Introduction sections. Medical professionals tend to use a higher proportion of contractive resources than medical students. Specifically, professionals orient to adopt more disclaim countering (hereafter 'countering') and proclaim pronouncement (hereafter 'pronouncement') than medical students in construing engaged meanings in the sections. This striking analytical finding indicates that at the beginnings of RAs medical professionals frequently constrain the dialogic space of referenced alternative propositions as countering views, against which they may direct their authorial pronouncement. However, medical professionals employ fewer proclaim endorsement (hereafter 'endorsement') than medical students in the Introductions of RAs. It seems that medical students might have the thought that using propositions construed by both authorial presence and reference to the external cited sources could be more reliable in the beginnings of their draft RAs.

On the other hand, medical professionals adopt a lower proportion of expansion than students in the Introductions. It is indicated that medical professionals and students share a similar percentage of attribute citations (hereafter 'citations'). However, students are inclined to adopt more entertain modalisation (hereafter 'modalisation') than professionals. Through citations and a higher proportion of modalisation, professionals and students tend to open up the dialogic scope of other alternatives by acknowledging and distancing the authorial stance away from the propositions. This is could be taken as a typical feature of heteroglossic expansion in the Introductions of RA genre.

6.2.1.1 Monoglossic Assertions in the Introductions of Medical RAs

Based on the data analysis for monoglossic assertions in the Introductions of medical RAs, it is found that bare assertions in this genre are frequently followed by or combined with heteroglossic options. Broadly speaking, medical professionals tend to employ more complicated patterning of monoglossic assertions with heteroglossic meanings in the sections. In relevant literature review, both medical professionals and students are likely to elaborate certain medical syndromes with assertions, which are normally followed by heteroglossic contractions and expansions. It sounds quite reasonable for professionals to start with producing positive declarations for existing medical problems and then address countering expectations to contract the dialogic space for opened-up deductive reasoning (hereafter 'deductive formulations') and personal assessment of possibility (modalisation) (see example **Cardio 6.1**). In comparison, medical students adopt a similar but simpler pattern (see example **Cardio 6.2**).

Cardio 6.1 Adiponectin (APN) **is a cytokine hormone** originally found to be released exclusively by white adipose tissue. **However**, recent **evidence has revealed** that APN also **can** be synthesized and secreted from human cardiomyocytes¹². (I) (the Published)
[Bare assertion + countering + deductive formulation + modalisation]

Cardio 6.2 In response to ER stress, there **is a significant up-regulation** of 78-kDa glucose-regulated protein (GRP78), ER chaperones, and GRP78 **is** normally **regarded as** an indicator reflecting the activation of ER stress. **However**, excessive and prolonged ER stress **can** trigger the activation of c-JUN NH2-terminal kinase (JNK) or transcriptional induction of C/EBP homologous (CHOP) or caspase-12 dependent pathways, promoting the initiation of the apoptotic process (15). (I) (the Students')
[Bare assertions + countering + modalisation]

In bare asserting the current situation of a certain medical problem, medical students sometimes may simply follow up disclaim denial (hereafter 'denial') to reject other dialogic alternatives. For example,

Cardio 6.3 Cellular signaling during APC **is complex**, and in many aspects, comparable to that of IPC. The intracellular mechanisms involved in APC have **not** been completely identified. (I) (the Students')
[Bare assertion + denial]

On other occasions, monoglossic assertions could be patterned with pronouncement. They may first spell out a recognisable medical phenomenon and its clinical manifestations through monoglossic assertions, which would joint with intervention of authorial voice by means of pronouncing major findings through citations. In such a way, medical professionals and students could offer a more convincing research background, which might indicate the severity of the problem and the necessity of a research direction. This type of pattern can be reflected in the following two examples.

Physio 6.1 Alzheimer's disease (AD) **is the most common cause of dementia** in the elderly population, characterized by progressive cognitive dysfunction. The major neuropathological hallmarks of the disease **are extracellular amyloid plaques and intraneuronal neurofibrillary tangles**, which **progressively accumulate in the brain** (Selkoe, 1991; Walsh and Selkoe, 2004). These neuropathologies **are closely linked with** chronic inflammation and neuronal degeneration (Hardy and Selkoe, 2002; Parachikova et al., 2008). (I) (the Published)
[Bare assertion + pronouncement + pronouncement]

Physio 6.2 Alzheimer's disease (AD) **is a neurodegenerative disorder**, leading to loss of memory, progressive decline in cognitive function, and premature death. One of the hallmarks of AD **is the presence of** numerous senile plaques in the main brain regions, especially hippocampus [1], an area known to play a role in memory processing. (I) (the Students')
[Bare assertion + pronouncement]

When positive declaratives are combined with expansion in the Introductions, medical professionals employ complex patterning. In this way, they first claim the causes for the bare assertion to contract the dialogic scope, which may then be accompanied by opened-up discursive interaction through double expressing subjective opinion of probability (see example **Cardio 6.4**). On the other hand, medical

students may adopt the pattern, in which asserting propositions are followed by stating willingness of rejecting other dialogic options in the Introductions (see example **Physio 6.3**).

Cardio 6.4 During CPB, ischemia/reperfusion injury **is inevitable, because** most of the hearts **have to** be arrested thus experiencing a period of ischemia, and then **must** be reperfused (Butler et al., 1993; Kirklin et al., 1983).
(I) (the Published)
[Bare assertion + causal relation + modulation + modulation]

Physio 6.3 The mechanism underlying LTD **were concentrated on** glutamic acid receptor, which **would not** be stated in detail here. (I) (the Students')
[Bare assertion + modulation + denial]

Occasionally, medical students may use the patterning of bare assertions with expanding citations. It seems that students would like to assert the severity of a medical syndrome through asserting propositions, which could be stressed by distancing authorial stances in cited sources (see example **Physio 6.4**).

Physio 6.4 AD **is a** serious public health **problem** representing one of the commonest causes of dementia in the elderly. Affecting tens of millions of people worldwide, AD **is predicted** to increase almost twice the frequency during the next 30 years^[2,3]. (I) (the Students')
[Bare assertion + citation/quotation]

6.2.1.2 Heteroglossic Contraction: Producing Warrantability and Reducing Commitment in the Introductions of Medical RAs

With respect to dialogic contraction in the Introductions of medical RAs, both medical professionals and students adopt fewer types of heteroglossic alternatives to restrict the dialogic scope. Construing engaged intersubjective stances in literature review of previous related research, medical professionals are likely to position authorial emphases through instances of pronouncements of medical development, which are followed by authorial distancing away from propositions through externalised citations of foreground relevant research outcomes (seen in example **Physio 6.5**). In

another way, pronouncing medical developments in a certain field may also be accompanied by directing countering views, which could represent the possibility of an undesirable medical situation (seen in example **Cardio 6.5**). Although pronouncement appear frequently in the Introductions of students' draft medical RAs, it is quite surprising that medical students scarcely use patterns of personal emphasis through pronouncement with other heteroglossic options.

Physio 6.5 Treatment of rodents or humans with N-methyl-D-aspartate (NMDA) receptor antagonists such as MK-801, phencyclidine (PCP) or ketamine **promotes** cognitive impairment **and enhances** positive and negative symptoms (Krystal et al., 1994; Lisman et al., 2008), and these drugs also **reportedly** exacerbate symptoms in patients with schizophrenia (Steinpreis, 1996; Jentsch and Roth, 1999). (I) (the Published)
[Pronouncement + citation/quotation]

Cardio 6.5 Restoration of blood flow (reperfusion) **is** currently the most effective method for limiting necrosis; **however**, this therapy **may cause** additional damages, referred to as ischemia/reperfusion (I/R) injury¹. (I) (the Published)
[Pronouncement + countering + modalisation + causal relation]

Both medical professionals and students highlight the dialogistic perspective in the Introductions of their RAs by direct reference to alternative viewpoints from external sources (endorsing propositions). Medical professionals delicately endorse their authorial stance towards research outcomes for contractive countering and negation, thus bringing about potential alternatives for further medical investment in a study (seen in example **Physio 6.6**). Medical students, however, use endorsing propositions for directing probability, which implies the likelihood of possible achievements in future medical research (seen in example **Cardio 6.6**).

Physio 6.6 Clinical **studies indicate** that some pharmacotherapies relieve positive symptoms **but fail to** improve cognitive impairments in executive function and in verbal, visual, and working memory (Conklin et al., 2005). (I) (the Published)
[Endorsement + countering + denial]

Cardio 6.6 Our previous **study** has **demonstrated** that adiponectin **could** protect cardiomyocyte H/R injury in vitro by inhibiting ER stress.
(I) (the Students')
[Endorsement + modalisation]

In contracting the dialogic space for alternative meanings in the Introductions of medical RAs, both medical professionals and students construe the engaged stances by introducing countering expectations and negations. The difference lies in that medical professionals contract the dialogic space through countering views for evidence-based deductive reasoning and subjective assessment of probability, hence eliciting the possible gap that future study might fill in (seen in example **Cardio 6.7**). In comparison, medical students adopt the rhetorical strategy of using countering expectations for reference to external voices (endorsing) and foreground possibility of negation, thus explicitly introducing the research gap for future relevant studies (seen in example **Physio 6.7**). Moreover, medical students engage themselves with propositions with acknowledging negation towards the probability of breakthroughs in medical research, which may reflect a different way of claiming the research objective in a study (seen in example **Physio 6.8**).

Cardio 6.7 **However,** recent **evidence** has **revealed** that APN also **can** be synthesized and secreted from human cardiomyocytes¹².
(I) (the Published)
[Countering + deductive formulation + modalisation]

Physio 6.7 **Although** above multiple **studies have proven** that HN and HNG **can** repress the cytotoxicity induced by A β *in vitro* and *in vivo*, the underlying molecular mechanisms by which HNG plays neuroprotective roles remain largely **unclear**. (I) (the Students')
[Countering + endorsement + modalisation + denial]

Physio 6.8 It is **unclear whether** there **must be** the alteration of phosphorylated level of CaMKII during LTP or LTD induction electrophysiologically.
(I) (the Students')
[Denial + modalisation + modalisation]

6.2.1.3 Heteroglossic Expansion: Modalised Options and Authorial Distancing in the Introductions of Medical RAs

Considering dialogic expansion in the Introductions of medical RAs, medical professionals and students employ the heteroglossic options for authorial distancing through cited sources and probability through modalisation in order to open the dialogic space. Medical professionals frequently adopt heteroglossic resources of probability for countering expectations and negations towards recent developments in medical investigations, which might be taken as the grounds for expanding the chances of breakthroughs in future research (seen in examples of **Cardio 6.8** and **Physio 6.9**).

Cardio 6.8 These findings **could** partly explain the association between inflammation and thrombosis in acute coronary syndromes, **though** the exact role of CRP in the thrombotic sequelae and possible therapeutic strategies are **still** to clarify. (I) (the Published)
[Modalisation + countering + countering]

Physio 6.9 In this context, glutamatergic neurotransmission hypofunction **may** in part account for cognitive impairment; **however**, there is **no** therapeutics available to treat cognitive impairment seen in patients with schizophrenia. (I) (the Published)
[Modalisation + countering + denial]

Occasionally, medical professionals use resources of presenting the normality of a certain aspect of medical research for authorial emphases through pronouncement, thus producing kind of validation for possible academic studies (seen in example **Physio 6.10**).

Physio 6.10 Activated microglia and reactive astrocytes **often** are closely associated with extracellular A β deposits, and **contribute not only to** the production of cytokines, chemokines, reactive oxygen species, and other neurotoxic substances, **but also to** neuronal apoptosis and other series of pathological events (Meda et al., 1999; Combs et al., 2001; Fan et al., 2007). (I) (the Published)
[Modulation + pronouncement]

Alternatively, medical professionals construe engaged positioning by distancing themselves away from the textual propositions through cited sources combined with potential possibility. In this way, medical professionals try to seek the opportunity of negotiating with readers within the heteroglossic context, expanding the dialogic spaces of alternatives throughout text (seen in example **Physio 6.11**).

Physio 6.11 Acute risperidone treatment **reportedly** increases dopamine (DA) release in the medial prefrontal cortex (mPFC), striatum and hippocampus (Hertel et al., 1996; Li et al., 2007) and **may** improve cognitive dysfunction via this pathway. (I) (the Published)
[Citation + modalisation]

In contrast to those heteroglossic patternings used by medical professionals in the Introductions, medical students frequently adopt the strategy of distancing themselves from textual formulations through cited sources for either heteroglossic potentiality or negation (seen in examples of **Physio 6.12** and **Physio 6.13**).

Physio 6.12 **Krejцова et al. showed** that a HN derivative **may** pass through the blood-brain barrier and suppress experimentally induced behavioral abnormalities. (I) (the Students')
[Citation + modalisation]

Physio 6.13 It **is reported** that postsynaptic application of a CaMKII inhibitor [autocamtide-3 derived peptide inhibitor (AC3-I), 2 mM] blocked LTP induction [19] [20]; the mice with a point mutation of alpha-CaMKII gene that blocked the autophosphorylation of Threonine at position 286 (Thr286) of this kinase had **no** N-methyl-D-aspartate receptor-dependent LTP in the hippocampal CA1 area and showed no spatial learning in the Morris water maze [21]. (I) (the Students')
[Citation + denial]

It appears that medical students prefer to construe the engaged stances in literature overview through distancing away from statement of developments or breakthroughs in medical science. In their opinions, this might be a reliable way to present the research objectives in future studies.

Sometimes, medical students use double cited sources to distance themselves from aspects of literature review, bringing about the grounds of reliability for possible research in medicine (seen in example **Physio 6.14**).

Physio 6.14 Caspases **are known to** be involved in apoptotic cascade, which are associated with AD^[41-43] and **have been shown to** be activated by A β exposure^[44]. (I) (the Students')
[Citation + citation]

Occasionally, medical students construe engaged positioning through modalised options combined with stating potential reasons for medical problems (seen in example **Cardio 6.9**). From this, medical students seem to be quite cautious to present the potentiality of future research in a certain medical field.

Cardio 6.9 In ischemic myocardium, subsequent reperfusion **could cause** calcium overload **because of** the depression of cardiac SERCA function and expression (24, 25). (I) (the Students')
[Modalisation + causal relation + causal relation]

6.2.2 System of Graduation in the Introductions of Medical RAs

Section 6.2.1 of this chapter dealt with the general patterning of monoglossic and heteroglossic alternatives construing for dialogic contraction and expansion in the Introduction sections of medical RAs. The current section will present the features of grading attitudinal aspects of meanings in the sections. Types of grading for two dimensions of attitudinal meanings and their frequency in the Introductions are shown in Table 6.2.

Table 6.2 Graduation in the Introductions of Medical RAs

Type of Graduation	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
FORCE	66	80.49	78	69.02
Intensification	29	35.37	26	23.01
Quality	9	10.98	12	10.62
Process	20	24.39	14	12.39
Quantification	37	45.12	52	46.01
Number	16	19.51	26	23.00
Mass/Presence	6	7.32	8	7.08
Extent	15	18.29	18	15.93
FOCUS	16	19.51	35	30.97
Sharpening	15	18.29	35	30.97
Softening	1	1.22	--	--

Table 6.2 demonstrates the types of graduation employed by medical professionals and students in the Introductions. In general, both professionals and students use a high proportion of force values than focus ones. However, differences arise in that medical professionals use a higher proportion of force value system than medical students in the sections. Among this dimension of value scaling, professionals prefer to use more intensifiers raising or lowering the intensity of process and quality for engaged positioning. Moreover, they tend to employ higher frequency of scaling extent than students in the Introductions. In contrast, medical students adopt more scaling quantification of number than professionals to convey attitudinal meanings in the beginnings of their draft RAs. In terms of the dimension of focus grading, it seems

that medical students prefer to sharpen the value more frequently than professionals. On the other hand, only one presence of focus softening in published professional RAs is to blur the type of valeur relationship represented in the Introductions, which is absent in students' draft ones.

6.2.2.1 Dimensions of Force and Focus Grading in the Introductions of Medical RAs

Generally, both medical professionals and students employ a few adverbial intensifiers as signaling for grading the dimensions of force for process and quality under Graduation in the Introductions of medical RAs. These intensifiers can be represented by the following examples.

Physio 6.15 The loss of cholinergic markers is **particularly** [Force: intensification for quality] prominent in the cortex and hippocampus, areas of the brain involved in cognition and memory. (I) (the Published)

Physio 6.16 These neuropathologies are **closely** [Force: intensification for process] linked with chronic inflammation and neuronal degeneration. (I) (the Published)

Cardio 6.10 The intracellular mechanisms involved in APC have not been **completely** [Force: intensification for process] identified. (I) (the Students')

Cardio 6.11 ER, acting as an intracellular Ca²⁺ storage organelle, is **predominantly** [Force: intensification for process] responsible for maintaining cellular Ca²⁺ homeostasis, which **directly** [Force: intensification for process] influences protein folding and subsequently ER stress and apoptosis (20). (I) (the Students')

Sometimes, medical professionals may combine scaling intensified process with quality (seen in example **Cardio 6.12**), or infuse intensified process and quality towards statement of developments in medicine with focus sharpening to pinpoint the valeur relationship for medical problems (seen in example **Physio 6.17**).

Cardio 6.12 While propofol protects ischemia/reperfusion heart **mainly** [Force: intensification for process] via enhancement of endogenous antioxidant capacity in myocardium, this is **totally** [Force: intensification for quality] different from isoflurane preconditioning. (I) (the Published)

Physio 6.17 Alzheimer's disease (AD) is the **most** [Force: intensification for quality] common cause of dementia in the elderly population, characterized by progressive cognitive dysfunction. The **major** [Focus: sharpening] neuropathological hallmarks of the disease are extracellular amyloid plaques and intraneuronal neurofibrillary tangles, which **progressively** [Force: intensification for process] accumulate in the brain. (I) (the Published)

On other occasions, medical professionals could combine intensification of process with sharpening values and quantified mass/presence (seen in example **Physio 6.18**).

Physio 6.18 **Increasing** [Force: quantification for mass/presence] evidence has shown that the **crucial** [Focus: sharpening] role of amyloid-beta protein (A β)-induced the inflammatory response is **integrally** [Force: intensification for process] involved in the development of the disease. (I) (the Published)

Occasionally, medical professionals employ quantification of number and time extent focus infused with focus sharpening to exemplify the value relationship between developmental treatment and certain medical problem for a period of time (seen in example **Physio 6.19**).

Physio 6.19 **Over the past 20 years** [Force: quantification for extent (time)], **a substantial number of** [Force: quantification for number] epidemiological reports have shown that **long-term** [Focus: sharpening] use of non-steroidal anti-inflammatory drugs is associated with protection from the development of AD. (I) (the Published)

There is only one occurrence of focus softening in the beginning section of medical RAs, which is adopted by medical professionals together with quantification of number in order to blur the value relationship between potentiality and research breakthroughs in medicine (seen in example **Physio 6.20**).

Physio 6.20 In this context, glutamatergic neurotransmission hypofunction may **in part** [Focus: softening] account for cognitive impairment; however, there is **no** [Force: quantification for number] therapeutics available to treat cognitive impairment seen in patients with schizophrenia. (I) (the Published)

In contrast to those grading patterns for attitudinal meanings used by medical professionals, medical students prefer to adopt more intensified quality patterning with quantification of number in the Introductions of their draft RAs (seen in example **Cardio 6.13**).

Cardio 6.13 It has become clear that **multiple** [Force: quantification for number] cellular pathways in the establishment of a cellular phenotype that makes the heart **more** [Force: intensification for quality] resistant to ischemic damage. (I) (the Students')

In addition, medical students frequently use double focus sharpening to highlight the value relationship in literature review of previous relevant medical research (seen in example **Cardio 6.14**). In this way, the rhetorical effect of attitudinal assessment could be built up by advancing authorial voices through presence of sharpening.

Cardio 6.14 So we hypothesized that elevated levels of CRP at 1 year after drug-eluting stent implantation were associated with **increased** [Focus: sharpening] risk of **major** [Focus: sharpening] cardiovascular disease after DES implantation. (I) (the Students')

Sometimes, medical students may pattern sharpened values with quantification of number in the Introductions of RAs (seen in example **Physio 6.21**).

Physio 6.21 AD is a **serious** [Focus: sharpening] public health problem representing **one** [Force: quantification (number)] of the commonest causes of dementia in the elderly. Affecting **tens of millions of** [Force: quantification (number)] people worldwide, AD is predicted to increase almost **twice** [Force: quantification (number)] the frequency during the next **30** [Force: quantification (number)] years. (I) (the Students')

6.3 Realising Intersubjective Stances in the Discussion Sections of Medical RAs

In the aforementioned sections of this chapter, patterns of Engagement and systems of Graduation in the Introduction sections of medical RAs were explored. The present section will focus on the construal of engaged intersubjective positioning and grading attitudinal meanings in the Discussion sections of medical RAs. Linguistic resources modeling for engaged stances in the sections will be examined in the first place, followed by the investigation of dimensions of grading for valuer relationship.

6.3.1 General Patterns of Engagement in the Discussions of Medical RAs

Resources construing for engaging positions in the Discussions can be manifested in Table 6.3. As reflected in Table 6.3, medical professionals and students still use more heteroglossic alternatives for engaged dialogistic positioning than monoglossic assertions in the sections. Again, bare assertions occur more frequently in the sections of students' draft RAs. Grounded in this, medical students show the preference of not directly acknowledging the possibility of heteroglossic diversity in the Discussions.

However, greater differences protrude in that medical professionals adopt a higher proportion of contraction than students in the Discussions. However, medical professionals tend to depend more on disclaim denial (hereafter 'denial'), pronouncement and causal relations than students in the Discussions; whereas they use fewer endorsement than medical students in the sections. Although there may exist these distinctions in contraction, both medical professionals and students may realise that this contracting effect could be achieved by relying more on authorial intervention,

possible causal relations and externalised sources.

Table 6.3 Engagement Resources in the Discussions of Medical RAs

Engagement Resources	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
Monogloss	16	4.79	28	7.41
Bare assertion	16	4.79	28	7.41
Heterogloss	318	95.22	350	92.59
CONTRACT	192	57.50	194	51.31
Disclaim	45	13.48	34	8.99
denial	23	6.89	14	3.70
countering	22	6.59	20	5.29
Proclaim	147	44.02	160	42.32
concurrence	8	2.40	14	3.70
pronouncement	104	31.14	106	28.04
causal relations	17	5.09	9	2.38
endorsement	18	5.39	31	8.20
EXPAND	126	37.72	156	41.28
Entertain	83	24.85	127	33.61
deductive formulations	27	8.08	21	5.56
modalisation	52	15.57	100	26.46
modulation	4	1.20	6	1.59
Attribute	43	12.87	29	7.67
citations/quotations	43	12.87	29	7.67

On the other hand, medical professionals adopt a lower proportion of entertaining expansion than students in the Discussions. With regard to heteroglossic alternatives construing for dialogic expansion in the sections, medical professionals employ higher percentages of citations and deductive formulations while medical students adopt more modalisation. It seems that medical professionals tend to acknowledge and distance their authorial stance away from the propositions and make deductive reasoning at the concluding parts of RAs.

6.3.1.1 Monoglossic Assertions in the Discussions of Medical RAs

In contrast to those complex patterning of monoglossic assertions in the Introductions of medical RAs, there occurs only a few examples of monoglossic positive patterning in the Discussion sections. In discussing research findings and outcomes, medical professionals make assertions of research results in a certain field of medical science, followed by cited sources in order to open up the dialogic space for the potential readers (seen in the example *Physio 6.22*).

Physio 6.22 Acetylcholine **is a neurotransmitter**, which involved with synaptic plasticity in learning and short-term memory. Acetylcholinesterase, also known as AChE or acetylcholine acetylhydrolase, **is an enzyme** that degrades the neurotransmitter acetylcholine, producing choline and an acetate group. Loss of $\alpha 7$ -nicotinic receptor **is found in patients** with diverse forms of dementia (Court et al., 2000). Acetylcholinestrerase activity **has been reported** to be altered in Alzheimer disease patients (Rinne et al., 2003). (D) (the Published)
[Bare assertions + citations/quotations]

In comparison, medical students tend to make positive declaratives for evidenced reasoning and potentiality in the Discussions of their RAs. This type of pattern may be characterized in the example *Cardio 6.15*.

Cardio 6.15 There **are many studies** recently **suggesting** that CRP levels **might** be a risk indicator for major cardiovascular events after DES implantation. (D) (the Students')
[Bare assertion + deductive formulation + modalisation]

6.3.1.2 Heteroglossic Contraction: Producing Validation and Decreasing Responsibility in the Discussions of Medical RAs

In contrast to the fewer types of patterning of heteroglossic resources construing for dialogic contraction in the Introductions of medical RAs, there are much more varieties of patterns for contractive options in the Discussions. Particularly, medical professionals employ various patterning to contract the dialogic space for alternative meanings. Both medical professionals and students adopt the patterns of stating causes for possible potentiality in discussing certain aspects of relevant medical research in the final sections of RAs. Comparatively speaking, medical professionals can handle quite sound and complicated patterns to represent the likelihood of scientific investigation. In one sense, they combine causal relation with denial and modalisation. In such a combination, professionals claim the direct reason for the impossibility of a certain aspect of academic exploration (seen in example **Physio 6.23**).

Physio 6.23 **Due to** differences in the role of different sites of autophosphorylation on PKC activities, we **were not able to** compare that PKC α activity was decreased by assessing phosphorylation of the PKC substrate NR1 (Ser 896). (D) (the Published)
[Causal relation + denial + modalisation]

By providing the potentiality of the cited sources, on the other hand, medical professionals might spell out the reason for conducting the scientific research in the Discussions. This type of pattern could be represented in the following example

Cardio 6.16 The **reason** why we performed preconditioning with isoflurane is that neurons studies have **reported** isoflurane preconditioning **may** protect heart from ischemia/reperfusion injury (Hanley et al., 2002; Kevin et al., 2005; Marinovic et al., 2006; Müllenheim et al., 2002; Roscoe et al., 2000; Tanaka et al., 2002, 2004). (D) (the Published)
[Causal relation + citation/quotation + modalisation]

In accounting for the outcomes out of academic studies, medical students may pattern causal relation with occurrences of modalisation. Through stating the possible reason of a research object at the beginning of a clause, students would like to produce the potentiality of a more convincing influence on practical application. This pattern may be characterised as follows.

Cardio 6.17 **As** anesthetic-induced preconditioning **can** also be demonstrated in humans, a thorough understanding of the signal transduction involved **might** have an impact on the clinical applicability of cardioprotection by APC. (D) (the Students')
[Causal relation + modalisation + modalisation]

In the presentation and discussion of more reliable and convincing research findings and results in the Discussions, medical professionals seem to employ more shared values or beliefs for externalised endorsing references (seen in the example

Cardio 6.18).

Cardio 6.18 **Consistent with** our recent clinical trial (Huang et al., 2011), the **results** of present study clearly **showed** that the cardiac functional recovery was improved by joint use of isoflurane and propofol, as evidenced by the significantly increased LVSP, dP/dtmax, dP/dtmin and cardiac output and decreased LVEDP when compared to using propofol or isoflurane alone. (D) (the Published)
[Concurrence + endorsement]

Also, professionals may pattern the shared beliefs with evidenced reasoning and potentiality for reflecting grounded research outcomes (seen in the example

Physio 6.24).

Physio 6.24 The level of phosphorylated CaMKII is **consistent with** the A β -induced LTP impairment in the hippocampal CA1 region, **suggesting** that reduced phosphorylation of CaMKII **maybe** play a role in the A β_{25-35} -induced LTP reduction. (D) (the Students')
[Concurrence + deductive formulation + modalisation]

At other times, they could cite external sources to indicate the possibility for the shared belief in research findings (seen in the example **Cardio 6.19**).

Cardio 6.19 This is **in accordance to** a recently **published** postmortem **study** based on sudden coronary death lesions that **could** also find correlation between serum CRP levels and the intimal immunohistochemical staining intensity [8]. (D) (the Published)
[Concurrence + citation/quotation + modalisation]

In addition, both medical professionals and students employ a greater proportion of pronouncement patterning in the Discussion sections of medical RAs. Comparatively, professionals employ higher frequency of more complex patterns. Sometimes, they may emphasise authorial voice through pronouncing potentiality of research findings or results in the sections (seen in the example **Cardio 6.20**).

Cardio 6.20 It **is worth mentioning** that the **resistance to the ER stress** induced by TG **seems to indicate** that the cardioprotective effect of gAd is correlated with SERCA2a in order to maintain intracellular Ca²⁺ homeostasis. (D) (the Students')
[Pronouncement + modalisation + endorsement]

Moreover, professionals could pronounce their intervention depending on double stating the possible scientific results in studies (seen in the example **Physio 6.25**).

Physio 6.25 Therefore, based on the present findings **we may suggest** that OKA (i.c.v) induced degenerative change in the cortical and hippocampal region **may** be an important factor for cholinergic dysfunction. (D) (the Published)
[Pronouncement + modalisation + modalisation]

Furthermore, medical professionals may pronounce aspects of research results for endorsing external references as well as deductive reasoning (seen in the example **Cardio 6.22**).

Cardio 6.22 The present study **confirmed** this fact and further **proved** that the cardiac VO₂ was also significantly correlated with myocardial oxidative stress status, **suggesting** cardiac VO₂ is predictive of both cardiac damage and oxidative stress in surgery with CPB.
(D) (the Published)
[Pronouncement + endorsement + deductive formulation]

Finally, they could formulate their authorial voice for countering views/negation (seen in the example **Cardio 6.23**) in presenting and discussing related results.

Cardio 6.23 They **found** an association with histological features of vulnerable plaques, **but** an association with clinical presentation of coronary artery disease was **not** examined [11]. (D) (the Published)
[Pronouncement + countering + denial]

Apart from pronouncement patterning for producing validation in the Discussions, medical professionals may use references of external voices through endorsing to validate the potentiality (seen in the example **Physio 6.26**). Otherwise, they could endorse externalised sources to validate the potentiality and authorial voice in discussions of research findings and outcomes within a medical domain (seen in the example **Cardio 6.24**).

Physio 6.26 This **study indicated** that increased mRNA expression **might** be **due to** up titration of acetylcholinesterase gene in respect to decreased acetylcholinesterase activity **due to** inhibitory action of donepezil (Sugimoto et al., 2002). (D) (the Published)
[Endorsement + modalisation + causal relations]

Cardio 6.24 The present **study demonstrated** that joint use of isoflurane and propofol **could** further attenuate the oxidative damage caused by ischemia/reperfusion injury, the effect of which **was** much higher than using propofol or isoflurane alone. (D) (the Published)
[Endorsement + modalisation + pronouncement]

More frequently, medical professionals adopt a large percentage of countering views as grounds for positive positioning through negation in the Discussions of research findings of medical RAs. The positive positioning is normally supported by pronouncing potentiality (seen in the example **Cardio 6.25**) and evidenced reasoning (seen in the example **Physio 6.27**).

Cardio 6.25 **Although** the effect of propofol on stunned myocardium remains **unclear**, previous studies **have provided** plenty of evidence that isoflurane **can** ameliorate cardiac function after stunning (Sidi et al., 2009; Symons and Myles, 2006). (D) (the Published)
[Countering + denial + pronouncement + modalisation]

Physio 6.27 **Although** cognitive impairment in PCP-treated animals is restored by acute or chronic risperidone treatment (Grayson et al., 2007; McLean et al., 2010), we did **not** observe similar effects in NVH-lesioned rats, **suggesting** that cognitive impairment seen in this model is resistant to risperidone treatment. (D) (the Published)
[Countering + denial + deductive formulation]

Alternatively, medical professionals employ countering expectations for deductive reasoning (seen in the example **Cardio 6.26**), possible potentiality (seen in the example **Cardio 6.27**) and necessity (seen in the example **Cardio 6.28**) to open up the dialogic space of some aspects of research results in the Discussions of medical RAs.

Cardio 6.26 Remarkably, this association was **only** found in ACS lesions, whereas TF expression **seemed to** be independent of intimal CRP expression within SA atheroma, **suggesting** additional, still unknown factors that enhance TF-synthesis and thrombogenicity of the atherosclerotic plaque [27]. (D) (the Published)
[Countering + deductive formulation + deductive formulation]

Cardio 6.27 **Even though** the present data **cannot** figure out the exact molecular signaling pathway underlying this synergic cardioprotective effect, **we believe** regulation of oxidative stress status in post-CPB myocardium **may** play an important role in this effect. (D) (the Published)
[Countering + modalisation + denial + modalisation + modalisation]

Cardio 6.28 **However**, the detailed ER stress-related apoptotic pathways modulated by APN **need to** be further defined. (D) (the Published)
[Countering + modulation]

In the end, medical professionals adopt negative positioning as a basis for countering expectation (seen in the example **Physio 6.28**), for evidenced reasoning (seen in the example **Physio 6.29**) and for possibility (seen in the example **Cardio 6.29**). In this way, they could either suggest the deficiency in the conducted medical research or some promising prospects for certain complicated medical problems.

Physio 6.28 CaMKII basal autophosphorylation is **not** affected by PCP treatment (Murai et al., 2007; Mouri et al., 2007); **however**, in the present study **we found** that CaMKII basal autophosphorylation levels significantly decreased, especially in the mPFC, dorsal striatum and hippocampal CA1 region in the NVH-lesioned rats. (D) (the Published)
[Denial + countering + endorsement]

Physio 6.29 In addition, there is **no** significant difference in the behavioral performance, inflammatory responses, and apoptotic cells between two sham-operated groups with either vehicle or HNG treatment which **suggests** that HNG itself **could not** directly enhance or impair cognitive function, and evoke an increase of neuroinflammatory cells, pro-inflammatory cytokines, and apoptotic cells in the brain. (D) (the Published)
[Denial + deductive formulation + modalisation + denial]

Cardio 6.29 Secondly, there is **no** distinct evidence that midazolam **could** abolish the protective effect of isoflurane precondition. (D) (the Published)
[Denial + modalisation]

6.3.1.3 Heteroglossic Expansion: Reasoning, Modalised Options and Authorial

Distancing in the Discussions of Medical RAs

Heteroglossic options construing for dialogic expansion in the Introductions of medical RAs usually revolve around the patterning of possibility as a basis for countering expectations or negation in order to produce positive positioning for dialogic space. In addition, medical professionals and students use cited sources of distancing themselves for potentiality in the Introductions of RAs. By these two major rhetorical strategies, professionals and students try to expand the discursive scope to address the possible research gap in a certain medical field, thus offering plausibility of conducting relevant studies.

In contrast, medical professionals and students adopt quite different strategies to demonstrate research findings and results in the Discussions. In the first place, medical professionals may employ the patterning of evidenced reasoning as grounds for proclaiming possible causal relationship between aspects of research findings and medical problems (seen in the example **Cardio 6.30**).

Cardio 6.30 Moreover, the cardioprotection of APN **seems to** be associated with the suppression of p38 signaling, **as** the p38-specific inhibitor SB **can** mimic the cardioprotective effects of APN. (D) (the Published)
[Deductive formulation + causal relation + modalisation]

On the other hand, medical students may use deductive reasoning as a basis for delineating possible reasons for impacts of research results upon disease symptoms (seen in the example **Cardio 6.31**).

Cardio 6.31 Findings from the present study **suggested** that gAd against ER stress induced by I/R **could possibly** be mediated by normalization of SERCA activity and protein expression **due to** the maintenance of $[Ca^{2+}]_i$ homeostasis through activation of PI3K/Akt as a protective way. (D) (the Students')
[Deductive formulation + modalisation + causal relation]

In presenting research findings or outcomes in the Discussion sections, medical professionals may adopt the patterning of deductive formulation and endorsement. In such a way, they could combine deductive reasoning to open the dialogic space with endorsing external sources to contract the dialogic scope of potential alignments and disalignments, thus validating textual propositions in discussing relevant research outcomes (seen in the example **Cardio 6.32**).

Cardio 6.32 Our study **reveals** not only an association between intralesional CRP expression and the acuity of clinical presentation, but also **indicates** a correlation of tissue specific features of plaque rupture and thrombus formation based on histological and additional angioscopic analysis. (D) (the Published)
[Deductive formulation + endorsement]

In expanding dialogistic scope of discussing research findings in the final parts of RAs, medical professionals rely on evidenced reasoning as foregrounds for pronouncing authorial emphases of some outcomes and cited sources, attributing probable challenges or doubts to previous related studies (seen in the example **Physio 6.30**).

Physio 6.30 Our earlier reports **suggested** that memantine (a NMDA receptor antagonist) **blocked** OKA induce elevation of mitochondrial [Ca²⁺] and anticholinergic drug, donepezil **is reported** to exert protective effect against intracellular [Ca²⁺] (Kamat et al., 2010) and glutamate toxicity in cultured cortical neurons (Akasofu et al., 2006).
(D) (the Published)
[Deductive formulation + pronouncement + citation/quotation]

To further demonstrate the discussions of research findings, medical professionals even depend on evidence-based reasoning for raising the potentiality of breakthroughs in medical science (seen in the example **Physio 6.31**).

Physio 6.31 This significant neuroprotective **effect** of HNG against A β 25-35-induced cell apoptosis **suggests** that HNG **may** be a potentially anti-apoptotic agent. (D) (the Published)
[Deductive formulation + modalisation]

Alternatively, they may draw on deductive reasoning for producing the negation of possibility, rejecting the certain aspects of research outcomes with no positive effects (seen in example **Physio 6.32**).

Physio 6.32 These **observations suggest** that the alterations in cholinergic system **may not** be considered as functional one. (D) (the Published)
[Deductive formulation + modalisation + denial]

In striking contrast, when medical students interpret and present research findings, they tend to employ evidenced reasoning as basis for addressing the functional obligation of research objectives in handling medical syndromes (seen in the example **Physio 6.33**). This might imply that medical students prefer to stress the

maximum effects of some aspects of research findings in the final parts of their draft RAs.

Physio 6.33 It strongly **suggested** that Nec-1 **should** inhibit OA-induced cell insults by inhibiting tau hyperphosphorylation and PP2A activity.
(D) (the Students')
[Deductive formulation + modulation]

Another primary heteroglossic alternative for expanding the dialogic scope of research results in the Discussion sections is to adopt the patterning of modalised options, through which writers may engage with readers more politely. Medical professionals could claim potential causes and use countering views, through which possible effects of research results are produced, thus validating the discussions of research findings (seen in the example **Physio 6.34**).

Physio 6.34 This **may** be a result of the incomplete inhibition of inflammatory responses, **because** there were **still** inflammatory responses above the control level. (D) (the Published)
[Modalisation + causal relation + countering]

Sometimes, medical professionals employ double cases of subjective assessments or modalised alternatives to raise the possibility of research effects, which are taken as a basis for proclaiming possible causes (seen in the example **Cardio 6.33**) or for pronouncing authorial emphasis (seen in the example **Cardio 6.34**) of certain medical operation.

Cardio 6.33 In addition to the cardiac functional performance after 60 min post-CPB, **we believed** that the effect of alternative use of isoflurane and propofol is **in all likelihood due** in part **to** an attenuation of myocardial stunning.
(D) (the Published)
[Modalisation + modalisation + causal relation]

Cardio 6.34 With these results as basis, **we speculated** that APN pretreatment **might** disrupt the p38 signaling, which in turn interfered with the transcription of ER stress-related genes including GRP78, **ultimately resulting in** reduced ER stress response and cell death.
(D) (the Published)
[Modalisation + modalisation + pronouncement]

To dialogically expand the discursive space of research discussions, both medical professionals and students make attempts to delicately distance themselves away from the factual state of results, which may be taken as grounds for contractive countering and negation of subjectively assessing the potentiality of certain research effects in the Discussions (seen in the example **Cardio 6.35**).

Cardio 6.35 A recent **study** also **showed** that midazolam (0.05 mg/kg) abolishes ischemic preconditioning (Rivo et al., 2006), **but we did not think** the midazolam used in induction **could** interfere with the present result **for two reasons**. (D) (the Published)
[Citation/quotation + countering + denial + modalisation + modalisation + causal relation]

Medical professionals also rely on cited distancing sources for raising the potentiality of endorsing explicit external viewpoints, thus construing the authorial alignment with externalized voices in the discussions of research findings (seen in the example **Physio 6.35**).

Physio 6.35 A β 25-35 **is known as** the neurotoxic domain of the full-length A β peptide (Pike et al., 1993; Cheng et al., 2006), and a number of **studies have demonstrated** that the acute injection of this peptide into animal cerebral ventricle **may** result in neurotoxic effects similar to those produced by the full-length A β (Yamada and Nabeshima, 2000; Stepanichev et al., 2004). (D) (the Published)
[Citation/quotation + endorsement + modalisation]

On the other hand, medical professionals expand the dialogic space through cited sources for raising the possibility of evidence-based reasoning towards research findings in the Discussion sections of RAs (seen in the example **Cardio 6.36**).

Cardio 6.36 Natarajan et al.²⁶ have shown that HIF-1 activation can upregulate APN in diabetic mouse hearts and attenuate postischemic injury, suggesting a potential cooperation between HIF-1 and APN in counteracting hypoxic stress. (D) (the Published)
[Citation/quotation + modalisation + deductive formulation]

Interestingly, as medical students make discussions of research outcomes, they also try to distance themselves away from explicit claims through cited sources, which are sometimes used for authorial pronouncement of medical performance (seen in the example **Physio 6.36**). It seems that medical students prefer to distance themselves from propositions to open up the dialogic space for alignment, but they may be lacking some rhetorical strategy to engage intersubjectively.

Physio 6.36 Nec-1 was reported to exhibit the selective inhibition of necroptosis, which has now been used as an operational definition of necroptosis. (D) (the Students')
[Citation + pronouncement]

6.3.2 Graduation in the Discussions of Medical RAs

Section 6.3.1 of this chapter explored the general patterns of monoglossic and heteroglossic alternatives construing for dialogic contraction and expansion in the Discussions of medical RAs. The present section will focus on the grading attitudinal aspects of meanings in the sections. Types of grading for two dimensions of attitudinal meanings and their frequency in the Discussions of medical RAs could be reflected in Table 6.4.

Similarly to the frequency found in the Introductions of medical RAs, medical professionals still adopt higher proportion of force values than medical students in the Discussion sections of medical RAs. Table 6.4 displays the types of graduation used by medical professionals and students in the Discussion sections. Generally, both professionals and students use a greater high proportion of force values than focus

ones.

Table 6.4 Graduation in the Discussions of Medical RAs

Type of Graduation	the Published (6)		the Students' (6)	
	<i>n</i>	%	<i>n</i>	%
FORCE	106	82.18	136	78.6
Intensification	41	31.79	61	35.3
Quality	9	6.98	20	11.6
Process	32	24.81	41	23.7
Quantification	65	50.39	75	43.3
Number	29	22.48	30	17.3
Mass/Presence	8	6.20	10	5.8
Extent	28	21.71	35	20.2
FOCUS	23	17.83	37	21.4
Sharpening	21	16.28	32	18.5
Softening	2	1.55	5	2.9

However, the difference exists in that medical students tend to use a higher proportion of quality intensification in discussing research findings. Another disparity is that medical professionals employ much more quantification number than students to express attitudinal meanings in the Discussions. In terms of the dimension of focus grading, medical students tend to soften and sharpen the type of value relationship more frequently in the sections.

6.3.2.1 Dimension of Force and focus in the Discussions of Medical RAs

As indicated in Table 6.4, medical professionals employ more intensified process and quantified number to scale the attitudinal alternatives in the discussions of research findings and results in the concluding parts of medical RAs. In grading the intensified process to discuss research outcomes, medical professionals may use adverbial intensifiers for the force of scaling values of those results (seen in the example **Cardio 6.37**). Significantly, medical students prefer to adopt V+infinitive to intensify the process in the Discussions of their draft RAs (seen in the example **Cardio 6.38**). This suggests that by means of intensified process, professionals and students try to strengthen the raised scaling degree of professionals' and students' intensity in displaying the related outcomes.

Cardio 6.37 The results **clearly** [Force: intensification for process] showed that combination use of isoflurane and propofol **significantly** [Force: intensification for process] elevated SOD activity, preserved E_n level and reduced MDA content, indicating the oxidative damage caused by ischemia/reperfusion injury was **remarkably** [Force: intensification for process] attenuated. (D) (the Published)

Cardio 6.38 However, it is unlikely that stimulation of pro-survival signaling pathways occurs **rapidly enough** [Force: intensification for process] to prevent damage from resulting from the initial injury during reperfusion. (D) (the Students')

More frequently, medical professionals may infuse quantification number with many other aspects of scaling values in order to validate the discussions of some research results. As represented in the following examples, quantification number can be combined with sharpening value relationship (seen in the example **Cardio 6.39**), with intensified process or quality (seen in the examples **Physio 6.37** and **Cardio 6.40**), and with other types of quantification (seen in the example **Cardio 6.41**). Through these various patterning of quantified number, medical professionals could be better

equipped to construe greater degree of reliability in presenting engaged stances in the Discussions of RAs.

Cardio 6.39 In analogy to our **present** [Force: quantification for extent (time)] intimal data, **several** [Force: quantification for number] clinical studies have shown a **short-term** [Focus: sharpening] and **long-term** [Focus: sharpening] reduction of elevated serum CRP values by statins, clinically associated with a **significant** [Focus: sharpening] improvement of the prognosis for these patients.
(D) (the Published)

Physio 6.37 **Extensive** [Force: quantification for number] apoptotic cells in the frontotemporal cortex and hippocampal regions were observed in A β 25-35-injected mice, while HNG treatment **significantly** [Force: intensification for process] reduced the increased apoptotic cells.
(D) (the Published)

Cardio 6.40 There are **some** [Force: quantification for number] limitations in our study. Firstly, although we showed a **promising** [Force: intensification for quality] protective effect of alternative use of isoflurane and propofol and tried to speculate its potential mechanism, **further** [Force: intensification for quality] deeper study in molecular level is still necessary to reveal the underlying mechanism.
(D) (the Published)

Cardio 6.41 A **recent** [Force: quantification for extent (proximity time)] study also showed that midazolam (0.05 mg/kg) abolishes ischemic preconditioning (Rivo et al., 2006), but we did not think the midazolam used in induction could interfere with the **present** [Force: quantification for extent proximity (time)] result for **two** [Force: quantification for number] reasons. Firstly, midazolam was **equally** [Force: intensification for process] administered to each group (0.1 mg/kg). Secondly, there is **no** [Force: quantification for number] distinct evidence that midazolam could abolish the protective effect of isoflurane precondition.
(D) (the Published)

In comparison, medical students tend to infuse focus sharpening and softening with many other dimensions of grading when they make discussions what have been found out in the concluding sections of their draft RAs. As will be shown in the following examples, sharpening may be infused with intensified process and quality (seen in the examples **Cardio 6.42** and **Physio 6.38**) and with aspects of quantification (seen in the example **Cardio 6.43**).

- Cardio 6.42** The mechanisms for the difference are not **fully** [Force: intensification for process] understood, and the possible explanations include the **long-lasting** [Focus: sharpening] anti-inflammatory effect, antiproliferative and anti-inflammatory actions of sirolimus after treatment of coronary lesions. (D) (the Students')
- Physio 6.38** **Current** [Force: quantification for extent (proximity time)] existing clinical therapies for AD, including cholinesterase inhibitors and NMDA antagonist have been shown to be **moderately** [Force: intensification for quality] effective in **some** [Force: quantification for mass/presence] improvement of cognitive deficits associated with the disease, but they have a **limited** [Focus: sharpening] effect on the disease progression. (D) (the Students')
- Cardio 6.43** Although polymorphism in ALDH2 gene is an **independent** [Focus: sharpening] risk factor for myocardial infarction, a **recent** [Force: quantification for extent (proximity time)] study showed that inhibited ALDH2 activity during surgery got **less** [Force: quantification for mass] I/R injury and **better** [Focus: sharpening] cardiac function. The contradicted clinical application of APC might need **larger** [Force: quantification for mass/presence] sample and **stronger** [Focus: sharpening] evidence to testify. (D) (the Students')

In addition, medical students may combine softening with intensified process (seen in the example **Cardio 6.44**) and quantification for extent (seen in the example **Physio 6.39**). In such a combination, students seem to have the perception that they could provide chances of representing authorial presence in stance and positioning. This may be achieved by using values softening, arousing a writer's alignment with reader in the Discussion sections.

- Cardio 6.44** The protective effect of gAd on TG induced ER stress and apoptosis was **further** [Force: intensification for process] warranted to elucidate our hypothesis. The anti-apoptotic effect of gAd on myocardial I/R could be achieved, **at least in part**, [Focus: softening] by suppressing ER stress. (D) (the Students')
- Physio 6.39** These results are **partially** [Focus: softening] consistent with **previous** [Force: quantification for extent (proximity time)] studies. (D) (the Students')

6.4 Concluding Remarks

This chapter mainly handles the exploration of resources construing for Engagement and their scaling features for Graduation within Appraisal system in published professional and students' draft medical RAs. It is found that medical professionals and students adopt different rhetorical strategies to construct engaged positioning in both Introductions and Discussions of medical RAs. Generally speaking, medical professionals employ a higher proportion of various patterning of monoglossic positives and heteroglossic contraction as well as expansion, thus producing expected rhetorical features in each section of medical RAs. In terms of grading valued propositions, medical students pay much more attention to both sharpening the value relationship and softening category boundary in Introductions and Discussions of RAs, which in a sense, might weaken their attending to other dimensions of scaling.

In the Introductions of medical RAs, medical professionals use a bit higher proportion of disclaim countering and proclaim pronouncement than students to restrict the dialogic space for heteroglossic alternatives. In comparison, students prefer to employ more endorsement to achieve this purpose. As for heteroglossic expansion, medical students tend to adopt more modalisation to open up the dialogic scope. Notably, professionals and students share the similar frequency of deductive reasoning and attributed citations in the sections. In general, medical professionals are good at employing complicated patterning of heteroglossic options in meaning construal in the sections. With regard to grading dimensions in the Introductions, professionals use a higher proportion of intensified process and extent quantification to scale the force value relationship in the Introductions. In contrast, students prefer more number quantification to grading the attitudinal meanings in the sections. In terms of focus

dimension, students have the same tendency to adopt a higher proportion of sharpening to highlighting the scaling.

On the other hand, a greater distinction in heteroglossic diversity arises in the Discussions of RAs. This time medical professionals employ a higher proportion of disclaim denial and countering to contract the space for dialogism. Considering proclaim contraction, professionals adopt more pronouncement and causal relations to open up the dialogic scope, whereas students still concentrate on using more endorsements in the sections. As far as expansive heteroglossic options are concerned, professionals attend to a higher frequency of deductive formulations and attributed citations in expanding heteroglossic diversity. In contrast, students still focus on using a higher proportion of modalisation to accomplish heteroglossic expansion in the sections. Significantly, more complicated patternings of heteroglossic alternative are employed by professionals in the concluding sections. Given graduation dimensions in the Discussions, professionals adopt a higher frequency of intensified process and all types of quantification to scale the value relations. In comparison, students prefer to use more quality intensification to achieve this effect. As what occurred in the Introductions, students still have the tendency to employ more sharpening as well as softening for grading the degree of attitudinal meanings.

All these findings in the Introductions and Discussions of medical RAs might be due to the negligence in previous writing pedagogy and thus could offer some insights into the future changes in pedagogical design for writing performance, which will be discussed in Chapter Eight.

Chapter Seven Evaluative Aspects of Language in Medical Reviews

In chapter six, intersubjective stances in the Introductions and Discussions of medical RA genre were handled. Concerning with Engagement and Graduation subsystems within the Appraisal system, linguistic resources construing for evaluative dispositions between medical professionals and students in these two sections were examined and characterised. The present chapter will focus on the realisation of evaluative positions in medical review genre. Patterns of evaluative positioning in the Beginning and Concluding sections of both published professional and students' draft medical reviews will be approached.

7.1 Modeling Evaluative Language in the Beginning Sections of Medical Reviews

Resources modeling Engagement and Graduation subsystems will be analysed drawing on the analytical frameworks delineated separately in 6.1.1 and 6.1.2 of chapter six. Engagement and Graduation subcategories in the Beginning sections of medical reviews will be dealt with. The annotation method is to be in accordance with that provided in chapter three. Findings resulting from data analysis will be reflected in the following sections.

7.1.1 Patterns of Engagement in the Beginning Sections of Medical Reviews

The current section will examine interpersonal meanings addressing engaging positioning and stances within heteroglossic context in the Beginning sections of medical reviews. General patterns of intersubjective positioning adopted by

professionals and students in the sections will be unfolded.

Table 7.1 Frequency of Engagement Resources in the Beginning Sections of Medical Reviews

Engagement Resources	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Monogloss	13	11.93	20	21.98
Bare assertion	13	11.93	20	21.98
Heterogloss	96	88.06	71	78.02
CONTRACT	62	56.87	47	51.64
Disclaim	14	12.84	11	12.09
denial	4	3.67	3	3.30
countering	10	9.17	8	8.79
Proclaim	48	44.03	36	39.55
concurrence	--	--	--	--
pronouncement	35	32.11	23	25.27
causal relations	10	9.17	5	5.49
endorsement	3	2.75	8	8.79
EXPAND	34	31.19	24	26.38
Entertain	22	20.18	19	20.89
deductive formulations	2	1.83	3	3.30
modalisation	15	13.76	12	13.19
modulation	5	4.59	4	4.40
Attribute	12	11.01	5	5.49
citations/quotations	12	11.01	5	5.49

According to Table 7.1, professionals and students adopt varied dialogistic means reflecting the characterised interpersonal style and rhetorical strategies when they attend to the writer-reader relationship in constructing the Beginning sections of their reviews. Both professionals and students are inclined to adopt more heteroglossic options for dialogistic engagement than monoglossic bare assertions in the sections. Students tend to employ more assertions, which suggest that they attempt to evade other dialogistic alternatives and to bring about homogeneity within an academic community in the Beginning sections.

In terms of heteroglossic options, both professionals and students choose to employ more heteroglossic contraction than expansion in the Beginning sections. Although professionals and students share a similar proportion of disclaiming contraction, they differ greatly in contractive proclaiming options. Generally, professionals use more proclaiming contraction than students in the sections. Among proclaiming alternatives, professionals resort to a higher proportion of proclaim pronouncement (hereafter 'pronouncement') and causal relations, whereas students depend on more proclaim endorsement (hereafter 'endorsement') to contract the dialogic space in the sections.

Given heteroglossic expansive diversity, professionals employ more expansion than students in the Beginning sections. Both professionals and students share a similar percentage of entertain modalisation (hereafter 'modalisation') and modulation (hereafter 'modulation') in the sections. However, professionals prefer to adopt a higher proportion of attribute citations (hereafter 'citations') while students orient to use a bit more entertain deductive formulation (hereafter 'deductive formulation') to expand the dialogistic scope in the Beginnings.

7.1.1.1 Monoglossic Assertions in the Beginning Sections of Medical Reviews

It is found that bare assertions are frequently followed by or combined with heteroglossic options in the Beginning sections. Professionals normally adopt more complicated patterning of this type in the sections. In presenting relevant review background in the sections, it is necessary for professionals and students to firstly address the severe consequences of certain medical syndromes through bare assertions, which are then followed by heteroglossic contractions or expansions to either constrain or expand the dialogic space. In most cases, professionals may model dialogistic positioning by pronouncement followed by bare assertions (see in example **Physio 7.2**). In such a pattern, they could double intervene the authorial presence by pronouncing summarised findings through direct reference to academic investigations of a medical phenomenon. This pronouncement may then be followed by asserting the recognised status of the discussed problem. On the other hand, professionals tend to adopt a more complex pattern, in which they could first claim the cause for the positive declaration, accompanied by double pronouncing the research outcomes of the factors triggering the syndrome (see in example **Physio 7.1**). Through these combinations, professionals attempt to reduce the dialogistic scope for other alternatives, expecting to offer a more reliable and persuasive background in the Beginning sections of review genre. These patterns can be reflected in the following two examples.

Physio 7.1 The most firmly established example is **Grave's disease**, which **is caused by** autoantibodies that **stimulate** the thyroid-stimulating hormone receptor (TSH-R) and thereby **promote** pathologically enhanced growth and endocrine dysfunction of the thyroid gland [1,2].
(B) (the Published)
[Bare assertion + causal relation + pronouncement+ pronouncement]]

Physio 7.2 Similarities **have been drawn** between senility and Parkinson's disease (PD), based on the similar degeneration of dopamine neurons [19]. In addition, aging **has been considered** to play a role in the pathogenesis of PD. In PD, the clinical signs **are detected** when 50% of nigral neurons and 80% striatal dopamine are lost. (B) (the Published)
[Pronouncement + pronouncement + bare assertion]

On other occasions, professionals may limit the dialogic scope by endorsing a direct reference to external sources for positively declaring the breakthroughs of scientific explorations concerning an aspect of medical problem. This patterning could be characterised as follows.

Cardio 7.1 Comparative **experiments indicated** that Ca^{2+} concentration in these microdomains reached at least 16 μM [8]. More recently, the same group **succeeded in measuring** directly the local Ca^{2+} concentration at the ER-mitochondria interface. (B) (the Published)
[Endorsement + bare assertion]

Sometimes, both professionals and students may begin with bare assertions of clinical symptoms to contract the dialogic space. These assertions could then be accompanied by opened-up deductive reasoning, allowing and recognising other different voices and options in the reviewing context. For example,

Physio 7.3 The majority of idiopathic DCM **patients have** agonistic $\beta_1\text{AR}$ autoantibodies in their circulation [5-7]. Clinical **correlations** [6,8] in conjunction with animal immunisation experiments [9-14] strongly **suggests** that these autoantibodies play a causal role in the pathogenesis of the disease. (B) (the Published)
[Bare assertion + deductive formulation]

Cardio 7.2 With the deterioration of the disease, **symptoms** of heart failure **appear** eventually. A multitude of **studies suggest** that loss of cardiac myocytes is a key problem in the development of cardiovascular diseases¹. (B) (the Students')
[Bare assertion + deductive formulation]

In comparison, students prefer to pattern bare assertion in joint with heteroglossic expansive alternatives to expand the dialogic space in the sections. They

tend to employ asserted proposition tailed by addressing the inclination or willingness of what they would review in the Beginning sections. This feature could be represented in the following example.

Physio 7.4 The SH-SY5Y cell line **provides an unlimited supply** of cells of human origin with the similar biochemical characteristics to human DAergic neurons. This paper **will** review the characteristics of the SH-SY5Y cells and the effect of differentiation on this cell model and the use of this cell line as a model of DAergic neurons for PD research.
(B) (the Students')
[Bare assertion + modulation]

Alternatively, students choose to combine monoglossic assertions with attribute citations in the sections. In such a way, they would first make a declarative of the reviewed aspect of a certain syndrome, which could be further evidenced by distancing authorial stances in quoted sources (see in the example **Cardio 7.3**).

Cardio 7.3 Cardioprotection by ischemic preconditioning (IPC) **was first described** by Murry *et al* (2). In 1988, **Wartier and colleagues demonstrated** that pretreatment with isoflurane improved left ventricular systolic function after left anterior descending coronary artery (LAD) occlusion lasting 15 min (3). (B) (the Students')
[Bare assertion + citation/quotation]

7.1.1.2 Heteroglossic Contraction: Asserting Reliability and Improving Solidarity in the Beginning Sections of Medical Reviews

In terms of heteroglossic contraction in the Beginning sections of medical reviews, there are limited types of heteroglossic options for intersubjective stances in the genre. To orient the restriction of dialogic space in the sections, both professionals and students show the preference of construing for dialogic positioning by countering expectations and negations. Professionals choose to contract the dialogic alternatives through recognising negation in a possible cause-effect statement for countering views. This pattern may reflect the research deficiency that previous scientific investigations

might have (seen in example **Physio 7.5**). On the other hand, students are inclined to adopt countering expectations for endorsing external sources and rejecting other options (negation), thus directly spelling out the gap in relevant studies (seen in example **Cardio 7.4**).

Physio 7.5 **However**, a targeted application of these concepts to the causal therapy or prevention of heart failure is currently hampered by diagnostic issues, **as** there are **no** available assays that are suitable for reliable quantification of β_1 AR autoantibodies in patient's blood samples or a standardised assessment of their impact on receptor function.
(B) (the Published)
[Countering + causal relation + denial]

Cardio 7.4 **However**, a quite recent **study reported** that during isoflurane inhalation (first preconditioning stimulus), remote ischemic preconditioning (second preconditioning stimulus) **didn't** provide benefit to the myocardium of patients undergoing on-pump coronary artery bypass grafting (7).
(B) (the Students')
[Countering + endorsement + denial]

Sometimes, professionals tend to postulate authorial presence through pronouncements of achievements in previous medical studies. These authorial voices are followed by countering views for claiming causal-effect possibility of the latest developments in relevant explorations (seen in example **Physio 7.6**). In addition, they may constitute authorial presence, accompanied by evidencing probability and obligation of findings in previous research (seen in the example **Physio 7.7**). In such a way, professionals attempt to formulate authorial emphasis by addressing the probalised responsibility of a proposed target treatment for a medical symptom.

Physio 7.6 PD **was** once **considered to be** a form of accelerated aging, **but it is** now **believed** that pathological process other than aging is involved in PD, **because** the regional selectivity of dopamine in the substantia nigra is different in PD from aging [14]. (B) (the Published)
[Pronouncement + countering + modalisation + causal relation]

Physio 7.7 Over the past three decades, growing **evidence has accumulated** that a number of other aetiologies are **probably** based on the same pathogenic principle and therefore **should** also be recognised as agonistic GPCR-targeted autoantibody-disease [3]. (B) (the Published)
[Pronouncement + modalisation + modulation]

Occasionally, professionals adopt the patterning of endorsing propositions for foreground possibility, which may suggest the possible accomplishments in reviewed previous medical investigations (seen in example **Cardio 7.5**).

Cardio 7.5 These **experiments demonstrated**, for the first time, that volatile anesthetics are **capable of** producing essential anti-ischemic effects.
(B) (the Published)
[Endorsement + modalisation]

7.1.1.3 Heteroglossic Expansion: Alternative Positions and Authorial Distancing in the Beginning Sections of Medical Reviews

With regard to dialogic expansion in the Beginning sections, professionals and students normally employ modalisation in order to open up the dialogic space of other possible alternatives. Professionals tend to employ the patterning of possible authorial position through modalisation for countering expectations and negations towards the reviewed aspects of related explorations. In this way, they could establish a reliable and convincing background which might be an orientation for possible achievements in future research. For example,

Cardio 7.6 Ca²⁺ ions **could** be taken up by mitochondria and accumulate in the mitochondrial matrix [2,3], **but** the cellular significance of this process remained **unclear**. (B) (the Published)
[Modalisation + countering + denial]

On the other hand, students prefer to use double modalisation, representing that their authorial positions are only one of other available positions within a research context. From this perspective, they attempt to expand the dialogic space for possible negative viewpoints in the Beginning sections. This feature may be reflected as follows.

Cardio 7.7 **They speculated** that high concentrations of isoflurane **may** have greater efficacy to protect myocardium during conditions of low coronary collateral blood flow. (B) (the Students')
[Modalisation + modalisation]

Sometimes, modalised options could follow other expansive choices to formulate the engaged intersubjective positioning in the sections. In such a way, professionals commence their textual propositions with obligation concerns for probable options within a scientific research context. This pattern can be signified as follows.

Physio 7.8 It **must** finally be noted that depending on the detection method deployed agonistic β_1 AR autoantibodies **can** be also determined in up to 12% of healthy individuals [8,19]. (B) (the Published)
[modulation + modalisation]

In contrast, students orient to open up the dialogic space by deductive reasoning for entertaining other alternatives in the Beginning sections. For example,

Physio 7.9 Taken together, these **relationships** between neurodegenerative diseases and T2DM **suggested** that drugs used to ameliorate hyperglycemia and IR **may** also have beneficial effects in neurodegenerative diseases patients (Perry and Greig, 2002; Perry and Greig, 2005; Perry and Greig, 2004). (B) (the Students')
[Deductive formulation + modalisation]

Under many circumstances, professionals tend to expand dialogic scope by acknowledging alternative positions and distancing themselves from textual propositions through cited references. In the first place, they employ cited sources for contractive countering views in the Beginning sections (seen in the example **Cardio 7.8**). On other occasions, they prefer to disassociate their presence from propositions, where a cause-effect situation is claimed in the sections (seen in the example **Cardio 7.9**). Finally, professionals would attribute the potential possibility of findings in relevant medical studies to an externalised source (seen in the example **Cardio 7.10**). These patterns are signified in the following examples.

- Cardio 7.8** This beneficial effect **was termed** “anesthetic preconditioning” (APC)⁶, occurred independent of changes in systemic and coronary hemodynamics, and persisted **despite** discontinuation of the volatile anesthetic before coronary artery occlusion, a “memory” period similar to that observed during ischemic preconditioning (IPC)⁸.
(B) (the Published)
[Citation/quotation + countering]
- Cardio 7.9** **John Bland and Edward Lowenstein** first **reported** in 1976 that administration of halothane (0.75 minimum alveolar concentration [MAC]) significantly ($p < 0.001$) attenuates ST-segment elevation **caused by** brief coronary artery occlusion in 6 dogs anesthetized with chloraloseurethane concomitant with a reduction in the primary determinants of myocardial oxygen consumption¹. (B) (the Published)
[Citation/quotation + causal relation]
- Cardio 7.10** By using mitochondria-targeted aequorin **these authors demonstrated** that inositol 1,4,5-trisphosphate (IP₃)-induced Ca²⁺ release (IICR) **could** in fact efficiently be transmitted to the mitochondrial matrix.
(B) (the Published)
[Citation/quotation + modalisation]

7.1.2 Graduation System in the Beginning Sections of Medical Reviews

The previous sections of this chapter have been concentrating on the patterning of monoglossic and heteroglossic alternatives construing for Engaging attitudinal dispositions in the Beginning sections. This section will approach features of grading attitudinal aspects of meanings in the sections. Types of gradability for two dimensions of attitudinal meanings and their frequency in the Beginning sections could be reflected in Table 7.2.

As shown in Table 7.2, professionals and students orient to employ a higher proportion of force value system than focus in the Beginning sections. However, professionals adopt higher percentages of force values than students in the sections. Among force dimension of value scaling, professionals prefer more intensifiers raising or lowering the intensity of quality and process for engaged stances. On the other hand, students depend on more scaling quantification to convey attitudinal meanings in the sections, among which they choose to use a higher proportion of number quantification

to increase the force values. Mass quantification has its occurrences in published professional reviews, while it is absent in students' ones. Given the dimension of focus grading in the Beginning sections, professionals have the inclination of both sharpening and softening the type of value relationship represented in the text, while students concentrate only on sharpening the value.

Table 7.2 Graduation in the Beginning Sections of Medical Reviews

System of Graduation	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
FORCE	63	81.80	55	70.51
Intensification	26	33.76	15	19.23
Quality	14	18.18	6	7.69
Process	12	15.58	9	11.54
Quantification	37	48.04	40	51.28
Number	20	25.97	28	35.90
Mass/Presence	5	6.49	--	--
Extent	12	15.58	12	15.38
FOCUS	14	18.18	23	29.49
Sharpening	12	15.58	23	29.49
Softening	2	2.60	--	--

7.1.2.1 Dimensions of Force and Focus Scaling in the Beginning Sections of Medical Reviews

Broadly speaking, both professionals and students choose several adverbial intensifiers for scaling the dimensions of force process and quality in the Beginning sections. These intensifiers could be typified as follows.

Cardio 7.11 This mechanism would then **mainly** [Force: intensification for process] serve to protect the cell from a **detrimentally** [Force: intensification for quality] high cytosolic Ca²⁺ concentration. (B) (the Published)

Cardio 7.12 To date, the anti-ischemic effects of volatile anesthetics have been validated **repeatedly** [Force: intensification for process] in **all** [Force: quantification for number] mammalian species in which APC and its related forms were studied. (B) (the Published)

Physio 7.10 The development of a stable and reliable dopaminergic (DAergic) neuronal cell model is **particularly** [Force: intensification for quality] necessary for studying the pathogenesis of PD and developing therapeutic strategies. (B) (the Students')

Rarely, students resort to an adjective to signal grading for intensified quality, which is jointed with number quantification. In such a way, students attempt to establish solidarity with readers in the sections. For instance,

Physio 7.11 **Many** [Force: quantification for number] manuscripts investigating the effects of GLP-1 therapies in neurodegenerative diseases have been published with **very** [Force: intensification for quality] promising results, and may indicate an alternative approach for these patients. (B) (the Students')

Occasionally, professionals and students adopt comparatives or superlatives realising for quality or process intensification in the Beginning sections to raise the force values. In addition, students usually pattern intensified quality and process with sharpening focus (seen in the example **Physio 7.13**) or quantification number (seen in the example **Physio 7.14**) to scale the valuer relations in the sections. This feature could be signified as follows.

- Physio 7.12** Among these alkaloids, *N*-methyl-1-(*R*)-salsolinol [1(*R*),2(*N*)-dimethyl-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline, *MM*(*R*)Sal] is now considered to be a **most** [Force: intensification for quality] possible neurotoxin candidate involved in the pathogenesis of PD [51-54].
(*B*) (the Published)
- Physio 7.13** Because neurons rely **more** [Force: intensification for process] heavily on glucose metabolism than other types, bioenergetic deficits are considered a **common** [Focus: sharpening] cause of neurodegenerative diseases.
(*B*) (the Students')
- Physio 7.14** T2DM and AD share **some** [Force: quantification for number] pathophysiological features. Amyloid-beta ($A\beta$), a **most** [Force: intensification for quality] common pathological hallmark of AD, is accumulated as extracellular plaques in the gray matter of the brain in AD, while in T2DM islet amyloid polypeptide (IAPP) is accumulated in the pancreas.
(*B*) (the Students')

With these apart, students employ V-infinitive structures to realise scaling for process intensification. These structures are normally combined with adjectives for focus sharpening (seen in the example **Physio 7.15**) or with quantified number (seen in the example **Cardio 7.13**) to highlight the valuer relationship in the Beginning sections. For example,

- Physio 7.15** **Primary** [Focus: sharpening] mesencephalic neurons are a **good** [Focus: sharpening] candidate source of DAergic neurons; however, human primary neurons are **extraordinarily** [Force: intensification for quality] **difficult** [Force: intensification for process] to obtain, culture and handle. Moreover, the ethical difficulties in obtaining **sufficient** [Focus: sharpening] and **appropriate** [Focus: sharpening] human primary neurons also limit the application of this cell source.
(*B*) (the Students')
- Cardio 7.13** Until now, the protective effect of isoflurane against myocardial ischemia/reperfusion (I/R) injury has been reported in **several** [Force: quantification for number] studies. Kehl *et al* (4) found that low concentration of isoflurane was **sufficient** [Force: intensification for process] to precondition myocardium against infarction.
(*B*) (the Students')

In terms of quantified intensification, both professionals and students tend to adopt decimal numbers or percentages to represent the situation of latest research findings in literature reviews. On one hand, professionals and students could combine

decimals and percentages with intensified quality by adverbials (see in examples of **Physio 7.16** and **Physio 7.17**). On the other, professionals choose to infuse quantification through percentages with either quantified number (seen in the example **Physio 7.18**) or mass quantification (seen in the example **Physio 7.19**). All these patterning may further signify the valuer relations for intersubjective positioning in the sections.

Physio 7.16 Patient data analyses have confirmed that an **8-30 percentage** [Force: quantification for number] of PD patients were diabetic, a **significantly** [Force: intensification for quality] higher percentage compared to age matched controls (Hu et al., 2007). (B) (the Students')

Physio 7.17 Agonistic β_1 AR autoantibodies are also present in roughly **a third of** [Force: quantification for number] ischemic cardiomyopathy cases [8,15], and they are **frequently** [Force: intensification for process] associated with arrhythmic complications also in other diseases primarily nor affecting the heart [16]. (B) (the Published)

Physio 7.18 There is linear fallout of dopamine neurons with aging at a rate of **5-10%** [Force: quantification for number] per decade [8], and the **limited number** [Force: quantification for number] of the cells causes dysfunction in cognition and motor movement. (B) (the Published)

Cardio 7.14 In addition, the latter study demonstrated that these microdomains termed hot spots, were **smaller than $1\mu\text{m}^2$** [Force: quantification for mass/presence] and encompassed about **10%** [Force: quantification for number] of the mitochondrial surface. (B) (the Published)

Moreover, professionals employ nouns and adverbs for scaling quantified number and mass/extent in the Beginning sections. They could combine nouns for quantified number with process intensification through adverbials to pinpoint the achievements in reviewed medical research (seen in the example **Physio 7.19**). It is also possible for professionals to pattern extent quantification by adverbs with intensified quality and process through adjectives and adverbials (seen in the example **Cardio 7.15**). Through this patterning, professionals are likely to specify the details in literature reviews of the Beginning sections.

Physio 7.19 The **majority** [Force: quantification for number] of idiopathic DCM patients have agonistic β_1 AR autoantibodies in their circulation [5-7]. Clinical correlations [6,8] in conjunction with animal immunization experiments [9-14] **strongly** [Force: intensification for process] suggest that these autoantibodies play a causal role in the pathogenesis of the disease. (B) (the Published)

Cardio 7.15 Such efficient transfer can occur in spite of the low Ca^{2+} affinity of the mitochondrial transport systems when IICR occurs **very** [Force: intensification for quality] close to the mitochondria so that a local microdomain with a **relatively** [Force: intensification for quality] high Ca^{2+} concentration is created **near** [Force: quantification for extent] the mitochondria [6,7]. (B) (the Published)

Considering focus sharpening in the Beginning sections, professionals depend on adjectives (seen in the example **Cardio 7.16**) or V-ed formulations (seen in the example **Physio 7.20**) to typify the authorial voice invested in construed value positioning. For focus sharpening by adjectives, they may infuse it with number quantification, while V-ed postulation could be combined with adverbial intensifier for quality. For example,

Cardio 7.16 Since the publication of this landmark paper, **several** [Force: quantification for number] studies provided **further** [Focus: sharpening] evidence that volatile anesthetics protected myocardium against reversible and irreversible ischemic injury. (B) (the Published)

Physio 7.20 This is a **particularly** [Force: intensification for quality] important research area for patients with T2DM since these individuals are at **increased** [Focus: sharpening] risk for CVD and recover from cardiovascular events **less** [Force: intensification for quality] well than patients without diabetes [6-8]. (B) (the Published)

Comparatively, students prefer V-ing forms for authorial investment in grading sharpening focus in the sections. In sharpening the alignment between writer and reader, they tend to pattern focus sharpening with intensified process, number and extent quantification. This pattern may be characterised as follows.

Cardio 7.17 The World Health Organization has reported that cardiovascular diseases (CVD) are the **leading** [Focus: sharpening] cause of death globally, and almost **23.6 million** [Force: quantification for number] people will die from CVDs **by 2030** [Force: quantification for extent], **mainly** [Force: intensification for process] from myocardial infarction (1).
(B) (the Students')

Finally, professionals constitute the two occurrences of softening through adverbs and adverbial phrases (seen in the example **Cardio 7.19**) in the Beginning sections. In one case, they infuse softening focus by adverbs with sharpening, intensified process and extent quantification (seen in the example **Cardio 7.18**). By using focus softening, professionals prefer to reduce their authorial investment in the valuer relationship in the sections. For instance,

Cardio 7.18 In fact, the **important** [Focus: sharpening] role of mitochondria as bona fide Ca^{2+} under physiologically relevant conditions and so affect normal cellular Ca^{2+} handling is **only** [Focus: softening] **generally** [Force: intensification for process] recognized since the seminal work of Rizzuto and colleagues **in the early nineties** [7] [Force: quantification for extent]. (B) (the Published)

Cardio 7.19 Comparative experiments indicated that the Ca^{2+} concentration in these microdomains reached **at least 16 μ M** [8] [Focus: softening].
(B) (the Published)

7.2 Construal of Intersubjective Stances in the Concluding Sections of Medical Reviews

In the aforementioned sections, patterns of Engagement and Graduation in the Beginning sections of the review genre were handled. The present section will concentrate on the construal of intersubjective stance through engaging dispositions and grading attitudinal meanings in the Concluding sections. Linguistic resources modeling for engaging stances in the sections will be dealt with in the first place, which is followed by examining dimensions of grading for valuer relationship.

7.2.1 Patterning of Engaging Positioning in the Concluding Sections of Medical Reviews

Table 7.3 Engagement Resources in the Concluding Sections of Medical Reviews

Engagement Resources	the Published (5)		the Students' (5)	
	<i>n</i>	%	<i>n</i>	%
Monogloss	8	6.45	1	3.23
Bare assertion	8	6.45	1	3.23
Heterogloss	116	93.56	30	96.78
CONTRACT	56	45.18	22	70.97
Disclaim	19	15.32	4	12.91
denial	9	7.26	1	3.23
countering	10	8.06	3	9.68
Proclaim	37	29.86	18	58.06
concurrence	2	1.62	--	--
pronouncement	26	20.97	14	45.16
causal relations	7	5.65	4	12.90
endorsement	2	1.62	--	--
EXPAND	60	48.38	8	25.81
Entertain	50	40.32	8	25.81
deductive formulations	5	4.03	2	6.45
modalisation	41	33.06	5	16.13
modulation	4	3.23	1	3.23
Attribute	10	8.06	--	--
citations/quotations	10	8.06	--	--

Resources construing for engaged stances in the Concluding sections could be demonstrated in Table 7.3. According to Table 7.3, both professionals and students resort to more heteroglossic options than monoglossic bare assertions for dialogistic engagement in the sections. However, striking differences emerge concerning the proportion monoglossic assertions and heteroglossic diversity in the Concluding sections. Professionals tend to adopt more monoglossic assertions without recognition of other dialogistic options at the final stage of their reviews.

In terms of heteroglossic options, professionals employ a lower proportion of resources realising contraction. They prefer more disclaiming contraction, attempting to exclude other dialogic alternatives in the final sections of reviews. In addition, they choose lower percentages of contractive proclaim in the Concluding sections. Proclaim endorsement only has its occurrence in published professional reviews, which is absent in students' draft ones.

On the other hand, professionals have inclinations of taking great higher percentages of entertaining and attributing expansion in the Concluding sections. In contrast, students choose to conclude their reviews regardless of any attribute citations. Respective features concerning engaged positioning will be presented in the following sections.

7.2.1.1 Monoglossic Assertions in the Concluding Sections of Medical Reviews

It is found that only professionals adopt patterns of monoglossic assertions in the sections. In one case, professionals make positive declarations of an aspect of scientific outcomes for countering expectations and for claiming the potentiality of dialogic options in the Concluding sections (seen in the example *Cardio 7.20*). In another case, they combine asserting research findings with cited sources in order to

open up the dialogic space for possible alternatives (seen in the example **Cardio 7.21**).

Cardio 7.20 Coronary collateral blood flow, a crucial factor in determining the tolerance of susceptible regions of myocardium to ischemic stress, **is** relatively **easy to quantify** in experimental models of ischemia-reperfusion injury (eg, using a radioactive microsphere technique), **but** such alternative routes of myocardial perfusion are difficult to quantify and **may** be highly variable in patients with coronary artery stenoses. (C) (the Published)
[Bare assertion + countering + modalisation]

Cardio 7.21 The large **differences** in the amount of myocardium at risk for ischemia between experimental and clinical studies **are emphasized** when the **following studies** are considered. Peak and sustained troponin I and T release clearly predicted infarct size, LV dysfunction, and long-term clinical outcome in patients with acute ST-segment elevation myocardial infarction after an occluded coronary artery was reperfused in the cardiac catheterization laboratory.^{97,98} (C) (the Published)
[Bare assertion + citation/quotation]

7.2.1.2 Heteroglossic Contraction: Countering Expectations and Potentiality in the Concluding Sections of Medical Reviews

In general, professionals adopt much more varied patterning to reflect the possibility of heteroglossic diversity in the Concluding sections. Under many circumstances, professionals employ the probalised countering views infused with announcement of the shared knowledge and beliefs in reviewed aspects of research findings in the sections (seen in the example **Physio 7.21**). Alternatively, they choose to use countering expectations as grounds for double possible potentiality of other dialogic diversity (seen in the example **Cardio 7.22**). In such ways, professionals attempt to take countering views as basis for expanding the dialogic scope for other options, strengthening the solidarity between writer and reader at the concluding parts.

Physio 7.21 **While** observed effects of GLP-1R agonists on triglycerides and markers of cardiovascular risk **may** be related to weight loss, exploratory data in both animals and humans are **consistent with** direct effects of GLP-1R agonists on endothelial function, excretion of sodium, improvement in SBP, limitation of ischemia/reperfusion injury, and with improved myocardial function in HF. (C) (the Published)
[Countering + modalisation + concurrence]

Cardio 7.22 **Nevertheless**, additional data **will** be required to convincingly answer **whether** volatile anesthetics do indeed exert clinically relevant anti-ischemic effects by reducing the incidence and severity of major adverse cardiac events in patients undergoing cardiac or noncardiac surgery. (C) (the Published)
[Countering + modalisation + modalisation]

In contrast, students prefer to adopt countering expectations as grounds for presenting the authorial arguments towards an aspect of research findings in their literature reviews in the Concluding sections. In this way, they are in the likelihood to establish their close associations with readers, though readers may have different viewpoints. For example,

Physio 7.22 **Although** differentiated SH-SY5Y cells described to date fall slightly short of the ideal PD cell model, differentiation **serves to make** SH-SY5Y cells more analogous to DAergic neurons and thus, a reasonable model for exploration of the pathogenesis of PD and evaluation of therapies. (C) (the Students')
[Countering + pronouncement]

In addition, professionals tend to postulate their authorial presence through pronouncing research findings for deductive reasoning of countering views in the reviewed literature in the Concluding sections (seen in the example **Cardio 7.23**). On the other hand, students prefer to claim the cause-effect status for the formulation of authorial voice in the sections (seen in the example **Physio 7.23**). Through these patterning, professionals and students make attempts to emphasise their authorial views either for reasoning the countering expectations or for stating the effectiveness of other alternatives.

Cardio 7.23 Several proteins **are** directly or indirectly **involved in** the regulation of this process, **but it appears** that the structural links existing between IP₃-sensitive Ca²⁺ stores and the mitochondria are crucial for proper mitochondrial function. (C) (the Published)
[Pronouncement + countering + deductive formulation]

Physio 7.23 Some differentiated SH-SY5Y cells **are more suitable** PD cell models than others, **because** they stop proliferating, have more DAergic neuronal properties, and have similar susceptibility to neurotoxins and neuroprotective agents as primary neurons. (C) (the Students')
[Pronouncement + causal relation]

To close down the dialogic space in the Concluding sections, students may pattern the necessity of filling in the deficiency in previous relevant research with claiming the cause-effect situation in the Concluding sections. In this way, they could better spell out the needs to make further investigations in certain areas of medicine. This pattern could be reflected as follows.

Cardio 7.24 **Since** most of current studies are based on animal models, further studies are **needed to** draw clear conclusions in human. (C) (the Students')
[Causal relation + modulation]

In terms of expansive entertaining options, professionals prefer to choose deductive reasoning as grounds for eliciting possibility of research impacts upon medical symptoms in the sections (seen in the example **Physio 7.24**). Sometimes, they tend to adopt deductive reasoning of potentiality for countering views (seen in the example **Cardio 7.25**). In such a way, professionals attempt to make effective reasoning of the possible findings, though there may appear an undesirable situation.

Physio 7.24 The increased **activity** of neutral (R)Sal N-methyltransferase **suggests** that genetic and environmental factors **may** increase the activity in PD to enhance the neurotoxin level in the substantia nigra. (C) (the Published)
[Deductive formulation + modalisation]

Cardio 7.25 Conversely, the general consensus of clinical **data suggests** that the use of a volatile anesthetic **may** be associated with a reduction in myocardial necrosis and modest short-term benefits, **even** when only a relatively small amount of myocardium is at risk^{86, 87}. (C) (the Published)
[Deductive formulation + modalisation + countering]

Moreover, professionals depend on double modalisation to emphasise the probalised options in reviewed literature in the Concluding sections (seen in the example **Cardio 7.26**). They may infuse modulated necessity when performing an aspect of exploration with obligation for expecting countering views in the sections (seen in the example **Physio 7.25**).

Cardio 7.26 The results of these clinical trials and meta-analysis support the **hypothesis** that the use of a volatile anesthetic during cardiac surgery **may** be associated with a reduction in myocardial necrosis and relative preservation of postoperative LV function compared with the intravenous anesthetic technique. (C) (the Published)
[Modalisation + modalisation]

Physio 7.25 While developing such diagnostic tests one **needs to** keep in mind that the assays **must** (i) detect autoantibodies recognising a conformational epitope so far **only** found properly represented in the native β_1 AR, and (ii) discriminate autoantibodies that bind and stimulate the β_1 AR from antibodies that bind the β_1 AR without affecting its function. (C) (the Published)
[Modulation + modulation + countering]

Finally, professionals may pattern attribute citations with disclaim countering and denial, reflecting authorial distancing as well as positive positioning in the meantime. This pattern may strengthen the persuasiveness of research reviews at the concluding parts. For instance,

Physio 7.26 Another catechol isoquinoline, 2-methyl-4,6,7-trihydroxy-1,2,3,4-tetrahydroisoquinoline, **was reported** to be cytotoxic to dopamine neurons by in vivo [18] and in vitro experiments [67], **but** the occurrence in human brains has **not** been confirmed. (C) (the Published)
[Citation/quotation + countering + denial]

7.2.2 Graduation System in the Concluding Sections of Medical Reviews

Resources realising for graduation system in the Concluding section of medical reviews are reflected in Table 7.4. As indicated in Table 7.4, professionals resort to more dimension of force grading in the sections, among which they depend on

a higher proportion of intensification for scaling the intensity of quality and process. In addition, professionals choose to adopt more mass quantification, whereas students orient to employ great higher proportion of quantified number and extent to measure proximity and distribution of time or space for attitudinal meanings in the Concluding sections. Professionals and students share the similar frequency of sharpening focus for value relationship. As for blurring the valuer relationship, students do not use any softening signals.

Table 7.4 Graduation in the Concluding Sections of Medical Reviews

Type of Graduation	the Published (5)		the Students (5)	
	<i>n</i>	%	<i>n</i>	%
FORCE	82	72.55	25	73.52
Intensification	43	38.05	8	23.52
Quality	23	20.35	4	11.76
Process	20	17.70	4	11.76
Quantification	39	34.50	17	50.00
Number	21	18.58	8	23.53
Mass/Presence	11	9.73	1	2.94
Extent	7	6.19	8	23.53
FOCUS	31	27.43	9	26.47
Sharpening	30	26.55	9	26.47
Softening	1	0.88	---	---

Generally speaking, professionals employ plenty of adverbial intensifiers to signal the scaling of intensification of quality, which involve *significantly, clearly, largely,*

etc. These adverbials may be typified in the following examples.

Physio 7.27 Preliminary clinical data **clearly** [Force: intensification for process] suggest that the presence of agonistic β_1 AR autoantibodies **significantly** [Force: intensification for process] worsens the prognosis of patients suffering from idiopathic DCM. (C) (the Published)

Physio 7.28 These include non-selective IA of total IgG and selective IA of IgG₃, which are **largely** [Force: intensification for quality] established therapy options, and selective IA of β_1 AR autoantibodies, which may have **some** [Force: quantification for number] advantages over the other IA options pending corroborative clinical studies of **larger** [Force: quantification for mass/presence] case series. (C) (the Published)

Cardio 7.27 Similarly, peak troponin I and T concentrations were **70.5** and **3** ng/mL, [Force; quantification for numbe] respectively, in patients with perioperative myocardial infarction after CABG⁹⁶, which also **far** [Force: intensification for process] exceed those observed in clinical trials of volatile anesthetic-induced myocardial protection in cardiac surgery patients. (C) (the Published)

In addition, professionals adopt V-infinitive structure to signal the scaling of intensification of process in the sections. For example,

Physio 7.29 The readout of such live cell reporter systems is **difficult** [Force: intensification for process] to standardise – even when automated. (C) (the Published)

On occasions, professionals tend to use comparative and superlatives to scale intensified quality and process in the Concluding sections.

Physio 7.30 A **broader** and **more** [Force: intensification for quality] complete picture of pathophysiologic and prognostic issues in β_1 AR autoantibody-mediated heart disease will emerge from the result of prospective diagnostic studies **currently** [Force: quantification for extent] planned or under way, which are expected to provide new insights into cardiac events capable of triggering β_1 AR-directed autoimmune processes and the contribution of such processes to the initiation and/or progression of CHF. (C) (the Published)

Physio 7.31 An alternative to IA that is potentially **more** versatile, **less** invasive, **less** expensive and **less** [Force: intensification for quality] burdened with hospitalisation is the neutralization and clearance of β_1 AR autoantiboes by systemic application of synthetic epitope mimics. (C) (the Published)

Physio 7.32 Possibly, that **dual** [Force: quantification for number] diagnostic goal will be **best** [Force: intensification for process] reached by a staged strategy. (C) (the Published)

Sometimes, they may pattern adverbial intensifiers with comparatives to strengthen the intensification of quality in the sections.

Cardio 7.28 In contrast, **substantially** less myocardium may be at risk for ischemia during elective cardiac surgery, and the incidence of **more** severe myocardial damage is **relatively** low unless an unanticipated intraoperative coronary artery occlusion occurs or myocardial protection efforts are **grossly** [Force: intensification for quality] inadequate. (C) (the Published)

With regard to focus sharpening, professionals normally adopt V-ed formulations and adjectives to produce sharply focused value relationship in the Concluding parts of medical reviews.

Physio 7.33 These studies may affect **future** [Force: quantification for extent] patient care, as **no current** [Force: quantification for number/extent] therapy for CVD provides the **unique** [Focus: sharpening] combination of potential actions proposed for GLP-1R agonists: **improved** [Focus: sharpening] glucose control with minimal hypoglycemia; **improved** [Focus: sharpening] endothelial function; reduced body weight; BP and serum triglycerides; **improved** [Focus: sharpening] recovery from ischemia; and **improved** [Focus: sharpening] hemodynamics in patients with **reduced** [Focus: sharpening] contractile function. (C) (the Published)

Occasionally, professionals prefer to infuse focused sharpening with quantified numbers in the sections. In this sense, they attempt to indicate the possible gap in previous studies in reviewing literature (seen in the example **Cardio 7.29**). On the other hand, professionals could combine sharpened values with mass quantification and intensified quality, strengthening the significant research results in literature reviews (seen in the example **Cardio 7.30**).

Cardio 7.29 Notably, **few** [Force: quantification for number] data have been presented to date directly indicating that the use of a volatile anesthetic improves **long-term** [Focus: sharpening] outcome or reduces the incidence of **major** [Focus: sharpening] adverse cardiac events in patients undergoing cardiac surgery. (C) (the Published)

Cardio 7.30 When considered together with the **very** [Force: intensification for quality] clear conclusions of laboratory experiments, the observations of **many small** [Force: quantification for number/mass presence] clinical studies conducted to date provide **important** [Focus: sharpening] circumstantial evidence suggesting that volatile anesthetics may exert **meaningful** [Focus: sharpening] protective effects if and when **larger** [Force: quantification for mass/presence] areas of myocardium sustain ischemic injury. (C) (the Published)

In contrast to the types of signaling for scaling dimensions of force and focus employed by professionals in the Concluding sections, students appears to use quite a few cases of adverbials and comparatives to signal the scaling of intensification of process and quality. For example,

Physio 7.34 Human neuroblastoma cell line SH-SY5Y challenged with 6 hydroxydopamine (6-OHDA) has been **widely** [Force: intensification for process] used as an in vitro model for PD. (C) (the Students')

Sometimes, students could employ comparatives to signal the scaling of intensification of quality in the sections. This feature may be signified as follows.

Physio 7.35 **Some** [Force: quantification for number] differentiated SH-SY5Y cells are **more** [Force: intensification for quality] suitable PD cell models than others, because they stop proliferating, have **more** [Force: quantification for number] DAergic neuronal properties, and have similar susceptibility to neurotoxins and neuroprotective agents as primary neurons. (C) (the Students')

Seldom, students use prepositional phrases for quantifying the temporal extent, which may be combined with adjectives for sharpening. In such a way, they would predict the research orientation, establishing a strong alignment with readers in the sections. For example,

Cardio 7.31 **In the future** [Force: quantification for extent], the inhibition of mitochondria-mediated apoptotic will be a **key** [Focus: sharpening] target in the treatment of cardiovascular disease. (C) (the Students')

7.3 Concluding Remarks

This chapter examines linguistic resources construing for Engagement and Graduation within Appraisal system in the Beginning and Concluding sections of medical review genre. In general, professionals employ different patterning of monoglossic positives and heteroglossic alternatives, thus producing expected rhetorical features in both sections. As for grading value propositions, professionals may attend to both force and focus value relationships in the Beginning and Concluding sections, whereas students sometimes may miss out aspects of dimensions of scaling.

In the Beginning sections, professionals and students choose to adopt more heteroglossic options than monoglossic bare assertions in the sections. Moreover, students orient to use more assertions in the sections.

Given heteroglossic options in the Beginning sections, professionals and students tend to employ more contraction than expansion. It is found that professionals and students share a similar proportion of contractive disclaim, but they differ significantly in proclaim contraction. Professionals resort to a higher proportion of proclaiming pronouncement and causal relations, whereas students rely more on proclaim endorsement to constrain the dialogic space for other options. With respect to heteroglossic expansion, professionals and students tend to share similar frequency of entertaining choices. To open up the dialogic scope in the sections, however, professionals are inclined to adopt higher percentages of attributed citations while

students choose to use a little higher portion of entertain deductive formulations. It is noted that professionals are capable of using complicated patterning of heteroglossic options in the sections.

In terms of scaling dimensions in the Beginning sections, both professionals and students prefer to use a higher proportion of force values than focus. However, professionals employ higher percentages of intensified quality and process, while students concentrate more on number quantification to scale the force value relationship in the sections. Moreover, professionals tend to use more mass quantification for scaling the attitudinal meanings, which it is absent in the sections students' draft ones. Considering focus dimension, professionals choose to concentrate on both sharpening and blurring the type of value relationship while students pay attention only to sharpening scaling in the Beginning sections.

On the other hand, a striking difference in heteroglossic diversity arises in the Concluding sections. Both professionals and students still depend on more heteroglossic options than monoglossic bare assertions for engaged stances in the sections. It is found that professionals choose to employ more bare assertions than students. As for heteroglossic contraction, professionals resort to higher frequency of disclaim denial and countering, whereas students prefer to adopt more pronouncement and causal relations to restrict the scope for dialogism. Although concurrence and endorsement occur in published professional medical reviews, they are absent in students' draft ones. Concerning expansive options, professionals are inclined to use a higher proportion of modalisation and attribute citations to open up the space for other heteroglossic alternatives. In contrast, no attribute citations are used by students in the sections.

With regard to graduation dimensions in the Concluding sections, professionals still adopt more force scaling, among which higher percentages of intensified quality and process are chosen in the sections. In addition, professionals tend to employ more mass quantification, whereas students prefer to use a higher proportion of quantified number and extent for grading attitudinal meanings in the Concluding sections. Both professionals and students share the similar percentages of focus sharpening for grading the value relationship in the sections. Again, focus softening is present in published professional reviews, which is absent in students' draft ones.

All these findings in the Beginning and Concluding sections of medical reviews might be associated with negligence in previous writing pedagogy and curriculum design. It is hoped that the exploration could offer some guidelines for future pedagogical and curriculum design, which will be further discussed in Chapter Eight.

Chapter Eight An Application in EAP Curriculum Design

The main purpose of the present study, as mentioned in Chapter One, is to change the current situation of pedagogy in higher education in China and to meet learners' needs within EAP context. The study is, in the first sense, inspired by my personal teaching experience in a university of China, where PhD candidates have been observed facing writing challenges in fulfilling university's graduation requirement of publishing academic papers in English-medium journals. In terms of academic publication, the inspiration for this study has also been the lack of pedagogical scheme for writing strategies and the gap of previous research endeavours to address NNS students' problems in both coherent textual organisation and construal of evaluative positioning. Motivated by these two aspects, the first objective of this thesis is to investigate the features of how medical texts are organised through thematic structures within the theoretical framework of Systemic Functional Linguistics. Secondly, construal of evaluative stances in medical writings is explored drawing on Appraisal theory.

To help PhD candidates fulfill the requirements for graduation, two different social conventionalised genres of medical written discourse have been chosen for this study, which involve medical research articles (RAs) and medical review articles (reviews). Two sets of corpora have been set up to accommodate to the aims of this study. One corpus consists of published professional RAs and PhD candidates' draft RA writings. The other one is comprised of published professional medical reviews and PhD candidates' draft medical reviews. Both published professional and students' draft writings are selected with equal numbers and high-relevance of subject areas in medicine. From this departure point, the corpora could be taken as representative of language used in two medical genres. Characteristics concerning thematic organisation

and intersubjective stances in two medical genres were examined concentrating on the Introductions/Beginnings and Discussions/Concludings of medical texts. The previous four chapters in this thesis have approached patterns of thematic structures and characterisation of evaluative dispositions in the genres of medical RAs and reviews. In this chapter, major findings in two different sections of medical genres are to be presented. A qualitative comparison between published professional and students' draft medical writings will be brought about.

8.1 Major Findings in Medical RA Genre

In the current section, major findings resulting from explorations on thematic organisation and construal of evaluative aspect of meanings in the genre of medical RAs will be approached. Patterns of thematic structures and resources realising for evaluative stances found in both published professional and students draft medical RAs are to be characterised and discussed. As noted in chapter two, examining thematic organisation in academic discourse may contribute to the knowledge of textual function as an intrinsic property of texts and its enabling power construing for ideational and interpersonal meanings in context of situation. Moreover, studying linguistic choices for thematic structure in academic writings help us to understand how the information structuring could lead to structural texture and coherence in texts.

8.1.1 Thematic Organisation in the Introductory Sections of RAs

Analysis of thematic organisation in the Introduction sections unfolds some interesting similarities and divergence between professionals and students in medical RA genre. In the standardised Introduction-Method-Results-Discussion RA structure (Swales, 1990), the opening section could be taken as the site for writers to provide

background information of research, make comments on authoritative literature arousing readers' appetite and claiming a gap to fill in, and to elaborate the possible methods (Swales, 1990). To achieve textual coherence and interaction, it is found that the predominance of unmarked, marked and textual Themes is utilised by both professionals and students in their Introductions. But there exists differences between them in the proportion of these Themes.

Having realised the linking importance of textual Themes in the flow of information organization, students share similar percentages of them with professionals in the Introductions. In terms of structural linkers and conjunctive adjuncts in the sections of RA genre, professionals reflect more lexical variation in the range of this type of Theme to realise the same logical relations. For example (conjunctions by the bold green parts and the bold blue parts for conjunctive adjuncts),

Cardio 8.1 **In addition, as** the population ages, the problem of ischemia/reperfusion injury is likely to increase **given that** elderly hearts are more susceptible to ischemia/reperfusion injury. (the Published)

Physio 8.1 **Also,** LTP may represent a good model **with which** to examine the neuronal mechanisms involved in diseases associated with cognitive such as AD ^[1], because of a correlation between impaired synaptic plasticity and memory deficits following the generation of A β aggregation in the rat hippocampus ^[10]. (the Students')

Physio 8.2 **Accordingly,** treatment with glycine as an NMDA receptor co-agonist antagonizes amphetamine-induced hyperlocomotion and PPI impairment observed in these rats. (the Published)

Cardio 8.2 **So** we hypothesized **that** elevated levels of CRP at 1 year after drug-eluting stent implantation were associated with increased risk of major cardiovascular disease after DES implantation. (the Students')

However, the divergence arises when it comes to the frequency of unmarked and marked Themes in the introductory sections. Comparatively, professionals may better handle an appropriate volume of unmarked Themes as an essential part in contributing to the textual organisation in the sections. Among unmarked Themes, they

tend to resort to a higher proportion of nominalised 'research-oriented objects', (e.g. atypical antipsychotic drugs, long-term potentiation (LTP) epistemic nouns and cited studies than students in coherently generalising and organising messages. In contrast, students depend heavily upon unmarked Themes comprised of "research-oriented objects" (e.g. anesthetic preconditioning; amyloid beta protein) when they relay related information and make comments on accomplishments from previous research. Moreover, professionals also show their capability of employing a higher incidence of marked Themes than students to highlight the prominence of research in the introductory sections.

Given interpersonal aspect meaning in thematic position, professionals could use an appropriate portion of interpersonal Themes to contribute to the interaction and evaluative effects in the beginning sections of RAs. It is apparent that students lack the ability to handle this type of Themes. Thematized comment usually 'occurs at a key transition points in the text' (Thompson, 1996: 130), and students show the preference of adopting it more frequently in the Introductions. It seems that higher occurrences of personal comments in thematic positions could lead to a sense of abrupt subjectivity and lack of objectivity in reviewing relevant literature and conveying information in the Introductions. For instance (the bold dark blue parts for thematized comment and textual conjunctive adjuncts by the bold blue parts),

Cardio 8.3 **It has become clear** that multiple cellular pathways participate in the establishment of a cellular phenotype that makes the heart more resistant to ischemic damage. (the Students')

Physio 8.3 **Therefore, it is very attractive** for us to clarify if A β 31-35 could also exhibit similar behavioral impairment of learning and memory induced by A β 25-35. (the Students')

8.1.2 Thematic Structures in the Discussion Sections of RAs

The Discussion section of RA genre, 'in strict contrast to Introductions' (Swales, 1990:173), is normally made up of three parts, which are involved in generalisation of research findings, argumentation, discussion and evaluation of results as well as conclusions (Dudley-Evans, 1994; Nwogu, 1997). In order to realise these objectives, professionals and students still employ higher percentages of unmarked, textual and marked Themes in the Discussions, which is similar to that in the Introductions.

In the final stage of RA genre, both professionals and students choose to use a similar proportion of marked and textual Themes in arguing and discussing relevant information. As for marked Themes, professionals could adopt higher occurrences of temporal, manner and place to meet the argumentative needs in the Discussions. This finding is in agreement with Swales' statement (1990). In the Discussion sections, writers are more likely to follow the direction of interpreting research outcomes and reviewing their significance 'within the established literature' (p173). In contrast, students rely on many more conditionals but fewer temporal, which represent their lack of language ability in constructing information message in the final sections of RAs. This finding might be due to the fact that it is necessary for writers to orient readers towards the aspects of research methods, feasibility and prospects of their own scientific study in the Introductions by reviewing previous relevant literature.

Given structural linkers and conjunctive adjuncts in the Discussions, professionals demonstrate their language skills in using varieties of textual Themes, which could be exemplified as follows (conjunctions by the bold green parts and the bold blue parts for conjunctive adjuncts).

- Physio 8.4** **Particularly**, our findings are in agreement with the previous study by Tajima and coworkers, **in which** icv injection of HNG prevented spatial working memory loss induced by icv injection of A β 25-35.
(the Published)
- Physio 8.5** **In conclusion**, our results show **that** A β ₃₁₋₃₅, but not A β ₃₅₋₃₁, should be a shorter active sequence responsible for the neurotoxicity of A β , and can result in a significant decline of spatial learning and memory of rats in a dose-dependent manner, **while** pretreatment with HNG can effectively prevent the behavior impairment induced by neurotoxic A β ₃₁₋₃₅.
(the Students')
- Physio 8.6** **Due to** differences in the role of different sites of autophosphorylation on PKC activities, we were not able to compare these two results.
(the Published)
- Cardio 8.4** **Besides**, a 'foreign body' reaction induced by the persistence of the stent into the vessel wall is responsible for chronic inflammatory reaction.
(the Students')
- Physio 8.7** **Thus**, we suggest **that** an attenuated NMDA receptor-CaMKII signal via decreased PKC α activity underlies hypofunction of the glutamatergic system and cognitive dysfunction, at least in NVH-lesioned rats.
(the Published)

The discrepancy lies in that professionals employ higher percentages of nominalised research-oriented, quoted studies and authors as unmarked Themes in characterising assessment and comparison of research significance in the Discussions. Apparently, the awareness of their significance in the final stage of argumentation and reasoning needs to be raised for students in future classroom activities. Students still show the preference of focusing on a much higher proportion of 'research-oriented Themes' (e.g. hyperphosphorylation of tau, inhibition of PP-2A) in the concluding sections of RA genre.

Another divergence could be reflected by the phenomenon that students still prefer to use higher percentages of thematised comment in the Discussions of RA genre. In addition, students employ distinctive structures of comment in thematic positions in the concluding sections. This might be interpreted by their eagerness and a strong awareness of evaluating, arguing and commenting on what have been

accomplished in their own and other related academic explorations. Numbers of thematised comment in the Discussions could be taken as a response to a research gap raised in the Introductions. For example (the bold brown parts for thematised comment),

Physio 8.8 **It was also known** that STAT function was included in the final step of several signal transduction cascades. (the Students')

Cardio 8.5 **It is worth mentioning** that the resistance to the ER stress induced by TG seems to indicate that the cardioprotective effect of gAd is correlated with SERCA2a in order to maintain intracellular Ca²⁺ homeostasis. (the Students')

Cardio 8.6 **It is well documented** that Ca²⁺ is required for proper protein folding to maintain normal ER function and Ca²⁺ disturbances has been shown to trigger ER stress, in which SERCA activity plays a critical role. (the Students')

8.1.3 Evaluative Interpersonal Resources in the Introductions of RAs

8.1.3.1 Intersubjective Positioning

Drawing on Appraisal theoretical framework within SFL, the present study concentrates on examining linguistic resources construing for Engagement and Graduation subcategories. As suggested in chapter two, Appraisal not only deals with interpersonal meanings, but also handles interpersonal, ideational and textual meanings simultaneously with a metafunctional perspective of 'modeling the dynamic construal of evaluative stance across texts' (Hood, 2004: 14-15).

With respect to construal of intersubjective stances in the Introductions of RA genre, the similarity between professionals and students lies in that both of them employ a higher proportion of heteroglossic resources. Moreover, professionals and students show the same tendency to adopt higher percentages of dialogic contraction than expansion within heteroglossic dimension in the introductory sections. The

general divergence between them, on the other hand, could be reflected in that professionals tend to use more contractive heteroglossing, whereas students choose to a higher portion of monoglossic options and heteroglossic expansion in the sections.

Students' general preference of using a higher proportion of monoglossic assertion in the opening sections of RA genre may reflect their disengagement with 'dialogic alternatives' (White, 2003: 262), and 'construes a proposition or proposal baldly, with no referencing to sources or alternative positions' (Martin, 2004: 324). In this sense, students seem to concentrate much more on constructing 'authoritativeness', 'assertiveness' and formality, thus setting up a relationship between the writer and readers (White, 2003: 265). As for the rhetorical functions of the Introductions in RA genre, absolute declaration of propositions could better fit within the context of research background and reviewing related literature. White (2003) highlights the characteristic contextualisation of monoglossic assertion as follows:

Thus the bare assertion, the undialogized utterances, frequently (and perhaps typically) operates where there is an assumption of ontological, epistemic and axiological commonality between textual voice and audience, where the addressee is assumed to operate with the same knowledge, beliefs and values as those relied upon by the proposition. The undialogized bare utterance typically operates when this commonality is assumed not to be at risk or in doubt.

(White, 2003: 263)

In terms of option heterogloss, it 'opens things up in various ways' (Martin, 2004: 324). Heteroglossic resources construing for dialogic contraction may represent the characteristics as that:

[Engagement resources] act to reject, counter, confront, head off or rule out actual or potential dialogic alternatives. Thus while still dialogic in that they acknowledge dialogic alternatives, they nevertheless act to close down or contract the space for these. They all act in some way to increase the interpersonal cost to those who would challenge the viewpoint currently being advanced by the text.

(White, 2003: 268)

In the Introductions of medical RAs, although professionals and students tend to use higher percentages of disclaim counter and proclaim pronounce, professionals show much dependence upon countering and pronouncement in contracting dialogic scope. By frequent employment of contractive pronouncement and countering, they could either more contract a 'dialogically contrary position' (through countering) or emphasise 'personal investment' in 'dialogic confrontation' (through pronouncement) in the sections (White, 2003: 271, 270, 269). In contrast, students choose to rely more on a higher proportion of proclaim endorsement to the quoted proposition, with the intention of bringing about the sense of credibility and authoritativeness in the sections.

As far as dialogic expansion is concerned, it refers to:

Resources for construing engagement by which the textual voice is positioned as being open to, or entertaining, dialogic alternatives. That is to say, by these meanings, alternative positions are construed as possible or even likely and as to greater or lesser degrees authorized.

(White, 2003: 268)

In terms of heteroglossic expansive resources in the Introductions of RA genre, it is found that professionals choose to count on more attribute citations and entertain deductions to expand the dialogic scope. On the other hand, students show a broad preference of using entertain modalisation for explicit evaluation in the sections.

It needs to be mentioned that although entertain modulation occurs in a lower proportion in the Introductions, their emergence in the RA genre represent ‘the social effect of obligation’ (Giltrow, 2005: 175). Giltrow highlighted that the modulated proposition may ‘contribute to the effect of neutrality and objectivity, at the same time, implicating research knowledge in modern systems and conscientious action’ (2005: 172). It seems apparent that professionals may use such type of resources skillfully.

8.1.3.2 Attitudinal Scaling

Concerning with resources for grading evaluative utterances, the general trend in the Introductions RA genre is represented by the condition that there are more graduation force than focus. The divergence in both the sections lies in that professionals tend to employ force category quantitatively for ‘adjusting the “volume” of gradable meanings, amplifying it or toning it down’ (Martin, 2004: 325), whereas students show the preference of adopting higher percentages of focus ‘for fine-tuning the valeur of experiential meanings – either to strengthen or weaken categorizations’ (Martin, 2004: 326).

Specifically, professionals choose to depend on more force intensification, especially intensified process while students rely more on quantified number to increase or reduce the intensity/amount in assessing attitudinal meanings in the Introductions. In the Introductions of RA genre, professionals and students tend to use adverbials for grading quality and process intensification (seen in the example **Physio 8.8**). Significantly, Graduation seems always to occur across Engagement systems in the Introduction sections, characterising the dialogic effects (Martin and White, 2008) (seen in the example **Physio 8.9**). The following examples may typify these features, in which professionals tend to use adverbs, while students prefer to use superlatives to

grade intensity. For example (the bold green parts for force intensity, quantification force by the bold orange part and the Engagement systems by the underlined parts),

Physio 8.8 These neuropathologies are **closely** linked with chronic inflammation and neuronal degeneration. (the Published)

Physio 8.9 Extracellular amyloid plaques are found **most** commonly in the hippocampus and neocortex, **two** memory-related centers. (the Students')

8.1.4 Evaluative Stances in the Discussions of RAs

8.1.4.1 Engagement Resources

Like intersubjective positioning present in the Introductions of RA genre, the general tendency in the Discussions resides in that there are more heteroglossic options than monoglossic declarations. Students still prefer to adopt more bare assertions than professionals, but its occurrence reflects a lower proportion in the sections in comparison with that in the Introductions. Again, professionals show a broad interest in relying much more on contractive options while students resort to expansive choices to engage with alternative positions in the concluding sections.

Heteroglossic alternatives in the Discussions, on the other hand, demonstrate the feature of reducing responsibility and improving reliability, which may seem quite appropriate in presenting, interpreting and arguing relevant research outcomes at this final stage. To contract dialogic space, professionals turn to a higher portion of disclaim negation, proclaim pronouncement and causal relations for rejecting other viewpoints, heightening their personal involvement and claiming cause-effect relations in the sections. In contrast, students depend on more proclaim endorsement to endorse their intersubjective stances for external sources in the Discussion sections.

To further open up the dialogic space for alternative positioning in the Discussions, professionals still show the preference of using more attribute citations and deductive reasoning. In comparison, students depend heavily on modalisation to explicitly make comments on what they are to interpret in the sections. To achieve the argumentative needs in the concluding sections of RA genre, students seem to show the deficiency of ability in distancing themselves from what they are going to present and argue, which provide implications for curriculum design and classroom activities.

8.1.4.2 Attitudinal Grading

Similar to Graduation in the Introductions of RA genre, both professionals and students choose to employ a higher portion of force dimensions than focus ones in the Discussions. In the Concluding sections, however, professionals tend to use more quantification force while students prefer to depend on more intensified quality and sharpening focus to accomplish argument and persuasion. Again, Graduation occurs almost always along Engagement system in the Discussion sections. For example (the bold green for force intensification, bold brown for force quantification, bold red for focus sharpening and Engagement by the underlined parts),

Cardio 8.6 **Additional** studies need to be done to clarify the **exact** mechanism underlying the reduction of HIF-1 α in the presence of APN.
(the Published)

Cardio 8.7 Kim et al's study showed that plasma CRP levels at **48** hours and **72** hours after stent implantation were **significantly** higher in the BMS than in the DES group. (the Students')

8.2 Major Findings in Medical Review Genre

Section 8.1 of this chapter summarises the major findings of thematic organisation and construal of evaluative stance through Engagement and Graduation

analysis within Appraisal system. This section will generalise features concerning thematic structures and intersubjective stance in medical review genre.

8.2.1 Thematic Structures in the Beginning Sections of Reviews

Thematic analysis in medical reviews reveals that students may experience bigger challenge in thematic choices constructing the review genre. In the Beginning sections, the obvious divergence between professionals and students is that students seem to lack of ability and skills in handling interpersonal Themes and thematised comment, which needs to be signified in the review genre.

With regard to unmarked Themes in the Beginning parts, students are not better skilled at generalizing and abstracting related messages. Notably, they even neglect to claim the review purpose in the sections of review genre.

8.2.2 Thematic Features in the Concluding Sections of Reviews

It seems obvious that the major problem for students in choosing types of Themes for textual message is in the Concluding sections of review genre. The significant difference between professionals and students lies in that students tend to adopt a lower proportion of textual Themes especially in the sections. This tendency could be caused by students' unfamiliarity of the review genre and lack of linguistic skills in thematic organisation. When it comes to comment in thematic position, however, they are inclined to use lower frequency of thematised comment in the Concluding parts. Above all, interpersonal Themes are surprisingly absent in the Concluding sections of students' review drafts. This deficiency for construing for interpersonal meaning in thematic position might be attributed to by negligence in language pedagogy and the students' unawareness of making evaluative claims in

thematic structures. All these divergences between professionals and students in review genre may have implications for future writing arrangement and pedagogy design within EAP context.

In particular, students seem to have serious problems in choosing subject heads of unmarked Themes in reviewing medical research in the Concluding sections. In the final stage of review genre, students choose to employ a lower proportion of epistemic nouns, which might be due to the lack of writing skills in generalisation and abstraction of the aspects of research outcomes in reviewing literature. This deficiency may reduce the sense of being objective and impersonal in reviewing relevant advances in scientific research of review genre. It is noted that heads of cited studies and authors are missing in the Concluding sections of students' review drafts. Starting from these problems arising in review genre, writing teachers may need to reform their pedagogy scheme and to provide more guidance in helping students choosing appropriate subjects and their proportion for unmarked Themes in constructing medical reviews.

8.2.3 Evaluative Resources in the Beginning Sections of Reviews

8.2.3.1 Intersubjective Stances

Analysis of engaged positioning in review genre reflects that there are higher percentages of heteroglossic alternatives than monoglossic assertions in the Beginning sections of review genre. The general divergence lies in that students adopt a greater proportion of monoglossic assertions to indicate the authority in the sections.

As for heteroglossic options, professionals choose to employ more contractive and expansive resources than students in the Beginning sections. To

contract the dialogic space in the Beginnings, professionals depend heavily on proclaim pronouncement and causal relations while students rely more on proclaim endorsement. This difference may suggest that professionals tend to highlight the subjecthood of a single voice whereas students are in the tendency of sharing responsibility for the proposition with the referenced sources, thus attempting to close down the dialogic space for other alternatives.

In terms of expansive options, professionals and students share the similar portion of modalisation and modulation in the Beginning sections. However, professionals show the preference of adopting more attribute citations to further expand the space for alternative stances in the sections. In contrast, students seem not to utilise this evaluative resource in the review genre.

8.2.3.2 Attitudinal Grading

It is found that both professionals and students employ higher percentages of force dimensions than focus ones in the Beginning sections of review genre. However, professionals choose to use more force Graduation whereas students focus much more on sharpening focus in the sections. Another discrepancy within force dimension lies in that professionals show the tendency of adopting more intensified quality and process while students prefer to resort to quantification force in scaling attitudinal meanings. In the Beginning sections of review genre, Graduation appears always across Engagement systems. The following instances suggest that professionals endorse the combination of Engagement resources with Graduation grading to quotation, reflecting convincing and persuasive effects. On the other hand, students only pattern Engagement with Graduation without any cited sources. For example (the bold green for signaling force intensification, bold brown for force quantification, bold

red for focus sharpening and Engagement by the underlined parts),

Physio 8.10 Agonistic β_1 AR autoantibodies are also present in roughly **a third of** ischemic cardiomyopathy cases [8,15], and they are frequently associated with arrhythmic complications also in other diseases primarily not affecting the heart [16]. (the Published)

Physio 8.11 Because neurons rely more heavily on glucose metabolism than other types, bioenergetic deficits are considered a **common** cause of neurodegenerative diseases. (the Students')

8.2.4 Evaluative Positioning in the Concluding Sections of Reviews

8.2.4.1 Engagement Resources

In the Concluding sections of review genre, students orient to employ higher frequency of disclaim and proclaim to close down the dialogic space. However, professionals resort to a higher proportion of both entertain and attribute to expand the space. In particular, they depend more on modalisation and citations to probabilise the opportunity of future research and distance themselves from the textual propositions in the Concludings. It needs to mention that there is no attribute citation in the concluding parts of students' draft reviews. All these problems emerging from the evaluative resources in review genre need to be paid attention to in future writing pedagogy and curriculum design.

8.2.4.2 Attitudinal Scaling

Considering scaling evaluative meanings in the Concluding sections of review genre, both professionals and students choose to use more Graduation force than focus. However, professionals tend to resort to higher percentages of force intensifiers while students adopt higher frequency of force quantification in the sections with more quantified number in particular. Notably, there is no occurrence of softening

focus in the concluding sections of students' draft reviews. These differences may be contributed by the unfamiliarity of the genre or lack of specific skills in harnessing what is to be reviewed in the Concluding sections of review genre. It might offer some implications for future writing pedagogy and curriculum design.

8.3 Qualitative Effects of Professional and Students' Writings

To better represent the qualitative effects of the general divergence arising from analysis in this study, extract of the Introductions and the Discussions from a pair of professional and students' RA texts are chosen to serve this end. Based on the illustration, it could be more clear and objective to manifest the modeling of thematic organisation and evaluative stances in the two sections of RA genre. Types of Theme will be underlined (textual Themes by the bold parts) and patterns of intersubjective stances are stated in bracket. Scaling of attitudinal meanings will be in bold green parts.

As indicated in the Introductions of RAs, both the professional and the student use more unmarked Themes (mostly nominalised research-oriented objects and epistemic nouns) to structure textual interaction with discourse community. On the other hand, both of them tend to employ marked Themes in lower frequency in the beginning sections. In comparison, the student is inclined to adopt varieties of textual Themes in linking the chunks of texts in the Introduction section. In addition, thematised comment is present in the Introductions of both published professional and student's draft RAs. However, both the professional and the student prefer not to employ interpersonal Theme in the Introductions. In terms of intersubjective positioning in the Introductions, the professional depend on more expansive resources to open up the dialogic space while the student resort to more contractive sources to constrain the dialogism. It seems that the student employ more patterning of Engagement than the

professional in the sections. Apart from this, the professional tend to use varieties of scaling for attitudinal meaning in the Introduction section.

Considering the Discussion sections of RAs, it is observed that research-oriented objects of unmarked Themes occur in a lower proportion. More epistemic nouns are present in the Discussion of the published professional RA, which is in a lower incidence in the student' draft RA. In addition, the professional resort to more marked Themes to highlight the textual prominence in the Discussion section, which is however, absent in the student's draft RA. Furthermore, the professional depend on more types of textual Themes in linking the larger part of text in the concluding section of RA. In terms of evaluative stances in the Discussions, professionals are capable of adopting various patterning of heteroglossic options to either expand or to contract the dialogic space, which has its limitations in the student's draft RA. It is noted that the professional are inclined to use more and various sources to scale the attitudinal meanings in the concluding part of RA.

Students' RA Text

Introduction Acute myocardial infarction (AMI) is responsible for the death of millions of persons worldwide each year¹ [Pronouncement]. Murry et al. demonstrated **that** a succession of short periods of myocardial ischemia and reperfusion prior to the continuous maintenance of coronary reperfusion protects the myocardium against subsequent prolonged ischemic insults, **which** has been termed 'ischemic preconditioning' (IPC)² [Citation]. This phenomenon is achieved by **several** pharmacological agents, including volatile anesthetics [Bare assertion]. Volatile anesthetics such as isoflurane have cardioprotective effects **when** administered before **a period of** myocardial ischemia and reperfusion, **and this phenomenon** is referred to as anesthetic preconditioning (APC)^{3, 4} [Pronouncement + citation]. APC is a cardioprotective strategy **that** increases resistance to ischemia and reperfusion (I/R) by eliciting innate protective mechanisms, and was described in various animal models³⁻⁶, as well as in humans^{7, 8} [Bare assertion + citation]. APC has been shown to reduce infarct size, and attenuate contractile dysfunction and serum CK-MB concentration caused by myocardial ischemia [Pronouncement]. Cellular signaling during APC is complex, **and in many aspects**, comparable to that of IPC [Bare assertion]. The intracellular mechanisms involved in APC have not been completely identified [Denial].

It has become clear that **multiple** cellular pathways participate in the establishment of a cellular phenotype that makes the heart **more** resistant to ischemic damage [Pronouncement]. Mechanisms reported to date involve inhibition of mitochondrial permeability transition pore (mPTP) opening⁹, the activation of kinases such as protein kinase C (PKC)^{10, 11}, the generation of reactive oxygen species (ROS)^{12, 13}, and opening of adenosine triphosphate-sensitive potassium channels (K_{ATP})^{3, 14, 15} [Citation].

Discussions Volatile anesthetics have a long history in the clinical management of anesthesia [Bare assertion]. Consistent with our results, **numerous** studies have shown that volatile anesthetics can protect the myocardium when applied before a harmful ischemic event and at the beginning of reperfusion, and that the characteristics of this protection are similar to those observed during classic IPC [Concurrence + endorsement + modalisation]. Studies have attempted to characterize the mechanisms involved [Pronouncement]. Cardioprotective mechanisms produced by APC were shown to involve activation of phosphoinositide 3-kinase²⁵, extracellular regulated kinases 1 and 2 (ERK1/2)³⁰, the 70-kDa ribosomal protein S6 kinase, endothelial ROS (eNOS)³¹, mitochondrial K_{ATP} channels^{3, 14, 15} and inhibition of glycogen synthase kinase 3-β³², **but** the precise mechanism responsible for APC remains undefined [Citation + countering + denial]. **However**, it is unlikely that stimulation of pro-survival signaling pathways occurs **rapidly enough** to prevent damage resulting from the initial injury during reperfusion [Countering + pronouncement]. **Recently**, attention has focused on mitochondria as a target of cardioprotection by volatile anesthetics^{11, 33, 34} [Pronouncement].

Published Professional RA

Introduction Volatile anesthetics, including isoflurane, have been proven to provide cardioprotective effects against reversible or irreversible myocardial ischemia/reperfusion injury by limiting infarct size and ameliorating contractile and diastolic function (Hanley et al., 2002; Symons and Myles, 2006; Tanaka et al., 2002, 2004) [Citation]. Similar cardioprotective effects by propofol have also been observed in **some** animal and clinical studies (Javadov et al., 2000; Kobayashi et al., 2008; Searle and Sahab, 1993; Xia et al., 2003) [Citation]. **Recently**, we observed the synergy of these two anesthetics in reducing cardiac damage in a clinical research (Huang et al., 2011) [Citation]. **A more detailed study** is still needed to confirm this effect and the underlying mechanism is also required to be investigated [Pronouncement]. According to current publications, the proposed mechanisms for cardioprotective effect of isoflurane preconditioning include activation of mitochondrial or sarcolemmal K_{ATP} channels (Marinovic et al., 2006; Roscoe et al., 2000) and increase of free radical release (Hanley et al., 2002; Kevin et al., 2005; Müllenheim et al., 2002; Tanaka et al., 2002, 2004) [Citation]. **While propofol** protects ischemia/reperfusion heart mainly via enhancement of endogenous antioxidant capacity in myocardium (Huang et al., 2011; Kobayashi et al., 2008; Tsuchiya et al., 2002; Xia et al., 2003, 2006), this is **totally** different from isoflurane preconditioning [Countering + pronouncement]. **Thus**, it is reasonable to hypothesize that combination

use of these two anesthetics could **further** attenuate ischemia/reperfusion-induced oxidative stress through respective pathways [Pronouncement].

Discussions More specifically, this study was to investigate the synergic effect between isoflurane preconditioning and propofol posttreatment [Pronouncement]. The reason why we performed preconditioning with isoflurane is **that numerous studies** have reported isoflurane preconditioning may protect heart from ischemia/reperfusion injury (Hanley et al., 2002; Kevin et al., 2005; Marinovic et al., 2006; Müllenheim et al., 2002; Roscoe et al., 2000; Tanaka et al., 2002, 2004) [Causal relation + Citation + modalisation]. **Although** the **precise mechanism** is not **fully** understood, activation of mitochondrial or sarcolemmal K_{ATP} channels (Marinovic et al., 2006; Roscoe et al., 2000) and increase of **small** amount of free radical release during period of preconditioning ((Hanley et al., 2002; Kevin et al., 2005; Müllenheim et al., 2002; Tanaka et al., 2002, 2004) have been identified to play **important** roles in this phenomenon [Countering + denial + pronouncement]. **As we** know, during reperfusion, the enhanced free radical generation (e.g. reactive oxygen species) contributes to postischemic cellular injury and extension of infarct size (Li et al., 2009, 2010) [Pronouncement]. **Thus**, posttreatment with isoflurane may probably aggravate oxidative damage by increasing free radical release [Modalisation + modalisation]. This notion is in agreement with the fact that **by now mostly** reported cardioprotection of isoflurane is from preconditioning (Lucchinetti et al., 2008; Marinovic et al., 2006; Müllenheim et al., 2002; Roscoe et al., 2000; Tanaka et al., 2002) [Pronouncement + citation]. **On the other hand**, the available data on cardioprotective effect of propofol are still controversial [Countering]. **Some studies** found it **no** benefit in reperfused myocardium (De Hert et al., 2002, 2003). **While the others** including our **previous** study, indicated it could protect reperfused heart by enhancement of endogenous antioxidant capacity (Huang et al., 2011; Kobayashi et al., 2008; Tsuchiya et al., 2002; Xia et al., 2003, 2006) [Citations]. **Thus we** combined isoflurane preconditioning and propofol posttreatment to see whether they synergistically protect heart from ischemia/reperfusion injury [Pronouncement + modalisation]. Consistent with our recent clinical trial (Huang et al., 2011), the results of **present** study **clearly** showed that the cardiac functional recovery was improved by joint use of isoflurane and propofol, as evidenced by the **significantly** increased LVSP, dp/dtmax, dp/dtmin and cardiac output and decreased LVEDP when compared to using propofol or isoflurane alone [Concurrence + pronouncement]. Such a protection was **further** proven by the preserved cardiac oxygen utilization and **limited** cardiac enzyme release [Pronouncement]. **Therefore**, our study supports the hypothesis that isoflurane preconditioning plus propofol posttreatment has synergic effect in preventing cardiac ischemia/reperfusion injury [Pronouncement].

8.4 Concluding Remarks

This chapter presents the major findings concerning patterns of thematic organisation, intersubjective stances and grading for attitudinal meaning in medical RA and review genres. Respective features in the Introductions and Discussions of medical RA genre; the Beginning and the Concluding sections of medical review genre are presented and discussed. To get the qualitative effect of these analytical findings, a sample pair of published professional and students' draft RA texts are selected.

In general, students could better handle thematic organisation, construal of intersubjective stance and attitudinal grading in the medical RA genre than in review genre. With respect to thematic structures in RA genre, students show the awareness of employing unmarked, marked and textual Themes as essential components to achieve coherent structural interaction in both Introductions and Discussions. In both the two sections of RA genre, it is my personal thinking that students, due to the possible lack of linguistic skills, rely too heavily on comments in thematic positions. As for interpersonal meanings in thematic positions in the Introductions, they are missed out in students' draft RAs. Among types of unmarked Themes in both sections of RA genre, lower incidence of epistemic nouns and cited references occur when students make generalisation and abstraction of related research or quote relevant studies to create liability.

In terms of Engagement and Graduation resources in RA genre, students tend to resort to monologic assertions in both sections to bring about authoritativeness. In the Introductions, professionals have the preference of using more attribute citations and entertain deductions while students choose to adopt higher volume of entertain modalisation to expand the dialogic scope. On the other hand,

professionals are inclined to depend much on proclaim pronouncement and disclaim countering whereas students prefer to more proclaim endorsement to contract the dialogistic scope in the introductory sections. However, when professionals interpret, argue and discuss related research outcomes in the Discussions, they rely more on proclaim resources such as pronouncement and causal relations as well as disclaim denial while students still choose to proclaim endorse more to close the dialogic space. In addition, professionals could better balance the employment of expansive resources like deductive reasoning, modalisation and attribute citations to expand the dialogism in the Discussion sections. It is argued that students seem to meet challenges of exploiting modalised resources to make explicit evaluations in both sections of RA genre, which needs to be noticed in designing classroom activities and curriculum in the future.

Given Graduation resources in RA genre, professionals and students share the similar tendency of adopting more force dimensions than focus ones. Significantly, they use Graduation resources almost always along the Engagement systems, which contribute to the emphasis of evaluation and interaction between writers and readers in both sections of RAs.

As far as review genre is concerned, it is apparent that students meet with problems in employing interpersonal Themes and thematised comments in the Beginning sections, which indicate a lower proportion in their draft reviews. Within unmarked Themes, they are still lack of abilities to use epistemic nouns and review purposes are even absent in the Beginnings of their draft reviews. When it comes to the Concluding parts of review genre, severe problems arise in that students adopt quite lower percentages of unmarked and textual Themes as well as thematised

comments. In particular, the interpersonal Themes are missed in the sections of students' draft reviews. In terms of unmarked Themes, they tend to use a lower proportion of 'research-reviewed objects' and epistemic nouns in the Concluding sections. Surprisingly, they do not quote any studies when they review relevant research in the sections.

With regard to Engagement resources in review genre, students show the capacity of using contractive resources to close up the dialogic space in both sections. However, the significant discrepancy exists in that they tend to employ a lower volume of attribute citation in the Beginning sections. When they try to conclude what they have reviewed in the final stage of review genre, attribute quotations are absent and explicit evaluation by means of modalisation is in a lower incidence.

Considering scaling evaluative meanings in review genre, students are inclined to adopt a lower proportion of force intensifiers in both the Beginning and the Concluding sections. However, students adopt higher frequency of force quantification in both the sections with more quantified number in particular. In addition, students tend to use more sharpening focus in the Beginning sections, but lower percentages in the Concluding sections. Notably, there is no occurrence of softening focus in both the sections of students' draft reviews. These differences may be contributed by the unfamiliarity or lack of specific skills in what to be reviewed in the Beginning and the Concluding sections of review genre.

It could be seen that professionals demonstrate the strong capability of making use of varieties of patterning of intersubjective stances and scaling of attitudinal meanings to accomplish the characterisation of intertextuality and dialogism in academic discourse. On the other hand, students' draft writings do perform a quite

satisfying outcome in thematic structure and construal of interpersonal evaluative meanings. However, they indeed encounter some problems in textual organisation and construal of evaluative stances and scaling attitudinal meanings, especially in review genre. It could be argued that useful insights towards textual organisation and realisation of evaluative meanings in academic writings may be elicited. All these differences between professionals and students in both RA and review genres may offer implications for future writing pedagogy and curriculum design. The present study is the first step in identifying the weakness of students' draft writings. For future reforms in writing pedagogy and curriculum design in classroom activities, there will be subsequent steps to make changes in the existing pedagogy and activities design.

Chapter Nine Conclusions and Implications

This study has explored features concerning organising textual message and construing interpersonal meaning in two different genres of medical texts, with the purpose of assisting PhD candidates in academic publication during their candidature. To achieve this end, two sets of corpus data are established consisting of published professional and students' draft writings in the genres of medical RA and review. Textual organisation in these two genres is examined by analysing thematic structures following Systemic Functional Linguistics (SFL) (Chapter Four and Chapter Five), while interpersonal aspect of meaning is characterised drawing on Appraisal theory (Chapter Six and Chapter Seven). The previous chapters of this thesis have presented and interpreted the major findings in both published and students' draft writings concerning those two aspects. The current chapter will be dedicated to review what this study has conducted, address some implications for pedagogy and syllabus design and suggest possible orientations in future research.

9.1 An Overview of the Study

9.1.1 Discoursal Research of Academic Writings within SFL

Systemic Functional Linguistics (SFL) takes a functional view towards language in that language is social semiotic meaning potential (Halliday, 1978, 1994a). Consisting of text or discourse (Halliday, 1978: 2), language in SFL is closely related to its social context of situation. Being 'a social linguistic theory', SFL offers a linguistic model to explain the ways of language in use in its social context (Painter, 1999: 37). In Comparison with other approaches for discoursal analysis, SFL is a 'holistic theory' to delineate 'the nature of language and its use in context' (Fawcett, 2000: 17). Based on

Halliday and Martin's (1996) work on scientific writings, it could be argued that SFL is a significant analytical model to interpret and understand scientific writings, reflecting educational values and implications in practice.

Within SFL theoretical framework, academic writings may be approached from different perspectives. These distinctive views highlight their respective ways to interpret language use in constructing academic texts. Involved in this area of investigations are analysis of generic structures, metadiscourse, cross-cultural and cross-linguistic studies, rhetorical organisations, and examinations of interpersonal aspect of meanings.

Drawing on SFL frameworks, the present research makes the first attempt to combine the investigation of coherent textual organisation with construal of interpersonal evaluative meanings in two different medical genres within EAP context. With analytical endeavours, NNS students' problems in thematic structures and the construction of evaluative meanings are reflected and discussed. The study tries to spell out that genre convention is the essential component of a discourse disciplinary community, and genre awareness may contribute to the effective communication within it. Disciplinary variations and cultures could also be implicated in the discursal construction of professional knowledge. Aiming at educational values, this research makes a contribution to the existing SFL theories in interpreting features of scientific writings.

9.1.2 Research into Thematic Structure in Academic Writings

Given explorations into linguistic and rhetorical features in written academic texts, genre analysis is the analytical approach which has been widely adopted by

scholars to serve the pedagogical purpose within EAP contexts. Included in this category is, for example, genre or move analysis in RAs. In addition, cross-cultural factors in the field of contrastive studies for academic writings have been widely examined in recent years. The extensive concerns could be reflected through abundant research attempts. However, studies concerning thematic choices in academic writings are comparatively scant.

As for thematic organisation in the genres of medical RA and medical review, the current study makes the first contribution to the understanding of thematic structures in these two different genres. Variations in thematic structures between published professional and students' draft writings may be taken as useful insights into the reforms of pedagogy in academic writing and curriculum design in the future.

In terms of thematic choices in RA genre, both medical professionals and PhD candidates adopt unmarked, marked and textual Themes as dominant thematic structures to achieve coherent textual interaction in both Introductions and Discussions. This result corresponds with what Gosden (1993) found out in his exploration, where unmarked Theme is fundamental to 'structure textual interaction' (p56) leading to functional organisation of the RA genre. In addition, there is a predominance of nominalised 'research-oriented objects' as subject heads of unmarked Themes in published professional RAs, which are normally embedded in material and relational processes. Nominalisation in such a way could represent the particular feature for constructing scientific knowledge, reality and for reasoning in RA genre. This is in agreement with Corbett's (2009) research findings. Corbett highlights this type of unmarked Theme in both the Introductions and Discussions of RA genre as that:

A feature of the academic genres is the tendency of the writer or writers to thematise the article itself and/or the procedures used in it. The majority of such Themes are found in the opening and closing passages of the article: the writers are announcing what they aim to accomplish or what they claim to have achieved.
(Corbett, 2009: 80, 84)

Another noticeable feature is that professionals use many more epistemic nouns in thematic choices in both sections of RAs. This research outcome reflects the argumentative nature and need for discussion, interpretation and abstraction of scientific examinations, which is relevant to that found in Martínez's (2003) study.

In addition, circumstantial marked Themes are often used by professionals. This finding is related to that in Corbett (2009) investigation, which reflects 'academic articles favour an orientation towards research' (p84). When marked circumstantial Themes occur, 'they may provide a reader with an interpretive framework for the rest of the sentence' (Brandt, 1986: 98). In contrast, lower incidence of epistemic nouns and cited references happens when PhD candidates make generalisation and abstraction of related research or quote relevant studies.

To argue and discuss significant results in the concluding parts, on the other hand, higher percentages of textual elements in thematic position are preferred by professionals than by students. The argumentation and abstraction nature in the Discussions makes it necessary to 'give thematic prominence to textual elements with a linking function' (Martin et al, 2010: 25). These research findings suggest that PhD candidates may not be aware and notice the importance of textual Theme in linking what they have demonstrated and presented in discussing research outcomes in the sections. This deficiency might be caused by the lack of relevant training and practice in writing sessions, which needs to be paid attention to in future writing pedagogy.

Given review genre, PhD candidates seem to experience bigger difficulties in using interpersonal Themes and thematised comments in the Beginning sections. For unmarked Themes, epistemic nouns are still in quite a lower proportion and review purposes are even absent in the Beginnings of their draft reviews. As to the Concluding parts of review genre, severe problems arise when students adopt lower percentages of unmarked, textual Themes as well as thematised comments. It needs mentioning that the interpersonal Themes are missed in two sections of students' draft reviews. Surprisingly, they do not quote any studies when they review relevant research in the sections. All these findings may suggest that PhD candidates are not familiar with the review genre and lack of genre knowledge in academic writing.

9.1.3 Research into Evaluative Aspects of Language in Academic Writings

Relevant literature demonstrates that a large amount of explorations dealing with interpersonal features in different genres of written academic texts have been conducted. On one hand, these explorations focus on resources construing evaluative aspect of interpersonal meanings in academic writings. On the other, interpersonal relationships between addresser and addressee in academic writings have also been approached.

In terms of studies on evaluative language in medical texts drawing on Appraisal theory, only two explorations have been performed (Pérez-Llantada Auría, 2011 and Fryer, 2013) which mainly concentrate on engagement resources in the texts. With regard to the study on evaluative aspect of meanings in both genres of medical RAs and medical reviews drawing on Appraisal theory, the present study undertakes the first attempt to investigate evaluative aspect of meanings in both medical genres focusing on two subcategories within Appraisal system, which involve Engagement and

Graduation. It could be argued that this thesis may provide important pedagogical insights into fuller understanding of the rhetorical structures and evaluative interpersonal meanings in different genres of medical writings.

As far as Engagement and Graduation resources in RA genre are concerned, PhD candidates tend to use more monoglossic assertions in both sections to produce authority. It is found that bare assertions are complicatedly patterned with heteroglossic entertain (modalisation or modulation) by both professionals and students, which is related to Miller et al (2014) and may 'allow [them] to make assertions based on interpretations of source texts, contributing to the more neutral, objective voice that is typically valued in academic writing' (p116). At the same time, monoglossic assertion may also be in a combination with proclaim pronouncement, by which professionals and students indicate their preference of the 'subjective involvement of the textual voice' in the foregrounding of absolute declaration of proposition (White, 2003: 270).

In the Introductions of RAs, professionals employ more attribute citations and entertain deductions while students adopt higher volume of entertain modalisation to expand the dialogic scope. On the other hand, professionals depend much on proclaim pronouncement and disclaim countering whereas students prefer more proclaim endorsement to contract the dialogistic scope in the introductory sections. This phenomenon is in agreement with Miller et al (2014), reflecting that 'greater use of proclaim: pronounce' could be taken as 'projecting a subjective voice of a single author' (p116) in academic writings. Considering the patterning of contractive resources in the Introductions, findings in this study manifest that professionals prefer to employ the patterning of pronouncement with heteroglossic options. In comparison, students are inclined to adopt the combination of disclaim choices with expansive alternatives. This

difference suggests that in order to establish writer-reader solidarity, professionals prefer to attend to ‘intensifications, authorial emphases or explicit authorial interventions or interpolations’ for possibly expanding the dialogic space in the Introductions (White, 2003: 269). For example (colored codes referred to Chapter Three),

Physio 9.1 **Although** above multiple **studies have proven** that HN and HNG **can** repress the cytotoxicity induced by A β *in vitro* and *in vivo*, the underlying molecular mechanisms by which HNG plays neuroprotective roles remain largely **unclear**. (/) (the Students’)
[Countering + endorsement + modalisation + denial]

Cardio 9.1 Restoration of blood flow (reperfusion) **is** currently the most effective method for limiting necrosis; **however**, this therapy **may cause** additional damages, referred to as ischemia/reperfusion (I/R) injury¹. (/) (the Published)
[Pronouncement + countering + modalisation + causal relation]

When professionals interpret and discuss research outcomes in Discussions, they rely more on proclaim resources such as pronouncement and causal relations as well as disclaim denial while students choose to proclaim endorse more to close the dialogic space. Moreover, it seems that professionals could better employ expansive resources like deductive reasoning, modalisation and attribute citations to expand the dialogism. In comparison, students prefer to modalise resources for making explicit evaluations in both sections of RA genre, which, it is argued, needs to be noticed in designing classroom activities and curriculum in the future. Professionals and students choose to adopt even a higher proportion of modalisation (though students use a bit more), which is in relation to Yang et al’s (2015) findings. Taking a SFG (Systemic Functional Grammar) approach to examine epistemic modality, epistemic modality in Yang et al’s exploration is viewed as having ‘two variables’ (Halliday, 2004) involving ‘value’ and ‘orientation’ (2015: 2). Representing a degree of certainty, the value of epistemic modality indicates ‘the writer’s commitment to the modalized statement’ (e.g.

'He **may** be ill.' [low value], p2). On the other hand, the orientation of epistemic modality 'conveys the writer's responsibility for the modal meaning', suggesting 'the subjectivity or objectivity' (e.g. '**It's likely** that they've heard by now.' [objectivity], p2).

For heteroglossic patterning, professionals and students may adopt the infusion of author distancing by means of quotations with modalised options in the Introductions. Significantly, professionals characterise their research probability by frequent employment of modalisation patterned with contractive alternatives. Modalised options in this patterning indicate either the instances of background or those of results in the Introduction sections, which is relevant to the finding in Stotesbury (2003). Stotesbury takes the view that 'modality represents an interface between implicit (i.e., intended) and explicit (i.e., visible) evaluation' (2003: 336). In Stotesbury's investigation in RA abstracts (2003), epistemic modality could be differentiated 'according to the functional parts of the abstract' involving 'background, purpose, method, results and conclusions' (p336). In addition, by making conservative statements through modalisation in literature review in the Introductions, professionals could demonstrate both progressions and limitations in scientific research. This characterised patterning is in agreement with what Yang et al (2015) have found out, which may reflect that professional writers 'tend to make claims that are cautious, reserved and objective' (p5). For instance (colored codes referred to Chapter Three),

Physio 9.2 Zou et al ^[27] **suggested** that the interaction of HNG with A β 1-40 **could** decrease A β -induced calcium rise and cell apoptosis by altering fibrogenesis of A β 1-40. (/) (the Students')
[Citation + modalisation]

Cardio 9.2 These findings **could** partly explain the association between inflammation and thrombosis in acute coronary syndromes, **though** the exact role of CRP in the thrombotic sequelae and possible therapeutic strategies are **still** to clarify. (/) (the Published)
[Modalisation + countering + countering]

Physio 9.3 The resultant decrease in acetylcholine dependent neurotransmission **is thought to** lead to the functional deficits of Alzheimer disease.
(I) (the Published)
[Modalisation]

Given Graduation resources in RA genre, professionals and students share the similar tendency of adopting more force dimensions than focus ones. Significantly, they use Graduation resources almost always along the Engagement systems, which contribute to the emphasis of evaluation and interaction between writers and readers in both sections of RAs.

In terms of Engagement resources in review genre, students show the capacity of using contractive resources to close up the dialogic space in both sections. However, the significant discrepancy appears since they tend to employ a lower volume of attribute citation in the Beginning sections. When students try to draw conclusions or summaries from what they have reviewed in the final stage of review genre, it is surprising that the attribute quotations are absent and modalised explicit evaluation is in a lower incidence. These research findings may indicate students' deficiency in mastery of linguistic skills and previous writing pedagogy.

Considering scaling evaluative meanings in review genre, students adopt a lower proportion of force intensifiers in both sections. However, students adopt higher frequency of force quantification in both the sections. In addition, students use more sharpening focus in the Beginning sections, but lower percentages in the Concluding sections. Notably, there is no occurrence of softening focus in both the sections of students' draft reviews. These differences may be contributed by the unfamiliarity with the genre or lack of specific skills in what to be reviewed in the Beginning and the Concluding sections of review genre.

Hyland made great contributions to the investigation of evaluative language in academic writings (e.g. Hyland 2001b; Hyland, 2002a; Hyland, 2002c). Concerning with writers' stance and their relations to readers in academic texts, Hyland (2005) made a comprehensive examination of 'linguistic resources of intersubjective positioning' in published RAs (p173). A two-way interaction model was established and provided in this study, which involve engagement (such as directives, questions, shared knowledge) and stance (hedges, boosters, attitudinal markers, self-mention). In comparison, Appraisal framework within SFL attends to evaluative stance towards both textual propositions and writer-reader relations from the perspective of intertextuality and dialogism. In this sense, Appraisal system seems to present an extensive analytical model for better understanding evaluative meanings in academic genres.

9.2 Implications for Pedagogy and Syllabus Design

As mentioned in Chapter One, this study is motivated by PhD candidates' pressures and challenges in constructing academic publication in a Chinese university during their candidature; the present research aims to apply research outcomes into pedagogical design within EAP context. Grounded in this research objective, some implications resulting from this study for EAP pedagogical purposes will be presented in this section.

9.2.1 Implications for Academic Writing Pedagogy

9.2.1.1 Teaching Writing English for Academic Purposes (EAP)

In terms of the social constructivist view, academic writings could be taken as socio-semiotic construction of scientific realities. In particular, composing academic writings deeply reflects institutionalised social and cultural constituted modes within a

disciplinary community. When teaching English for academic purposes, academic texts, in the first instance, has to be seen as 'both context constrained and context creating' (Kaplan and Grabe, 1991: 203) in which writing itself is not only 'a response to some need to express, but it is also simultaneously contributing to, reinforcing, and redefining notions of what may be construed as part of the knowledge-canon and of what may be construed as "writable"' (p203). In this sense, academic writings could be the site for individual academics to cooperate with members and represent relationships within a community. As Hyland argues: 'it is largely through texts that individuals collaborate with others, both to create knowledge and define their academic allegiances', indicating 'how this is accomplished in a range of genres and disciplines' (2004d: x). In addition, writing instruction within EAP context needs to emphasise that the construction of academic writing may involve different strategies, which might include 'conceptualising, organizing and producing texts', and 'variations in the contexts and communities, the roles of reader and writer' invoked (Hyland, 2004d: 146). Teaching academic writing, in this way, could avoid treating academic literacy as 'an independent variable' (Hyland, 2004d: 146) and tries to take the view that academic writing is closely related to its social contexts. Finally, teaching academic writing needs to spell out that academic writing is embedded in a disciplinary culture, and at the same time, indicates relevant communicative behaviours within particular discourse groups (Hyland, 2004d).

When writing courses within EAP context aim to prepare academic practitioners for publication, the need for both linguistic and non-linguistic (social conventions) levels (Hyland, 2012, cited in Flowerdew, 2015: 259) has to be stressed. Instead of perceiving academic writing as a chore, practitioners could be assisted by fostering a feeling of involvement in their disciplinary discourse community. This could

be achieved 'with the strategies they might employ in the publication process itself, giving particular attention to the analysis of their target publications and the navigation of the revision process' (Hyland 2012, cited in Flowerdew, 2015: 259). This sense of involvement in a particular academic group is emphasised by Lillis and Curry (2006). They argue that significant "literacy brokers", such as editors, reviewers, academic peers, and English-speaking friends and colleagues', may help contribute to 'successful academic text production' (Lillis and Curry, 2006: 4). On the other hand, linguistic level courses need to highlight the features of published academic texts and make them explicit to the learners (Hyland 2012, cited in Flowerdew, 2015: 259).

With this apart, writing for academic publication is not just a research report of presenting major findings in an objective way. Instead, academic writing for publication 'involves the interpretation and modification of information, the citation of appropriate "authoritative" literature, and the imitation of appropriate models in order to be accepted and, in turn, to become part of the authoritative literature' (Kaplan and Grabe, 1991:208). From this point of departure, disciplinary conventionalised practices within a social context can be represented and realised in a specific genre of academic writings. Above all, the main components for each academic discipline are embodied through 'varied academic practices of writing and reading' (Hyland, 2004d: 145). Grounded on the proceeding account, future pedagogy within EAP context needs to take both writing and reading into consideration, combining writing with reading as a whole into instruction. In this way, teaching writing could be better embodied in accommodating to the learners' needs within EAP contexts.

9.2.1.2 Genre-based Approach in Academic Writing Instruction

Given the research outcomes from the present study, it could be insightful to develop students' discourse competence in academic writing. With the emphasis on developing students' discourse competence as central aims for writing instruction within EAP context, teaching materials for writing courses 'will be extended units of written discourse' (Bruce, 2008: 1). To achieve this discourse-based pedagogical purpose in teaching academic writing, genre-based writing instruction is needed. By means of genre-based approach in writing instruction, teachers may find the ways of 'systematically classifying and deconstructing larger language entities' to meet the needs arising from EAP teaching context. (Bruce, 2008: 1). In particular, this approach may offer effective theoretical frameworks to language teachers 'around which they can organize their courses in order to promote the development of the discourse competence of their learners' (Bruce, 2008: 1).

Basically, genre-based writing approach 'is concerned with what learners do when they write' (Hyland, 2004b: 5), and builds up an effective relationship between 'the conventionally recognized, organizational stages of a social genre' and 'actual linguistic features of exemplar texts'. And these linguistic features found in an authentic text are regarded as 'characteristic of the particular genre that the text belongs to'. (Bruce, 2008: 35). It could be claimed that once teachers have an understanding of the essence of this approach, they may 'identify the kinds of texts that students will have to write in their target occupational, academic, or social contexts and to organize their courses to meet these needs' (Hyland, 2004b: 5). Moreover, genre-based writing approach may provide teachers a chance to view writing practice 'as an attempt to communicate with readers – to better understand the ways that language patterns are

used to accomplish coherent, purposeful prose' (Hyland, 2004b: 5). In sum, genre-based writing approach may serve as a means for teachers to offer students with 'explicit and systematic explanations of the ways writing works to communicate' (p6).

It may be observed that genre-based approach in teaching writing reflects some priorities in its application. Generally, there are seven advantages of employing this approach, which involve the following aspects (Hyland, 2004b). In the first instance, genre-based writing teaching is 'explicit' (Hyland, 2004b: 10), which may 'offer writers an explicit understanding of how target texts are structured and why they are written in the ways they are' (p11). Secondly, both texts and contexts are systematically concentrated on in this writing approach, where 'teaching materials are based on the ways language is actually used in particular writing contexts' (Hyland, 2004b: 12). More importantly, linguistic patterns construing texts are linked with contexts in genre-based writing approach, through which 'students are offered a way of seeing how different texts are created in distinct and recognizable ways in terms of their purpose, audience, and message' (p12). Another aspect of advantage genre-based instruction lies in its orientation of writer-needs. Teaching materials and the organisation of courses are based on students' needs. Fourthly, writing teachers plays the 'central role' of being supportive in students' learning process and developing their creativity (p11). In addition, genre-based writing approach may empower students to have access to linguistic patterns and possible variations in texts, fostering their critical understanding. Finally, genre-based writing instruction contributes to raising teachers' consciousness of texts, which could increase teachers' confidence in teaching writing (p11).

Possible implications from genre-based writing instruction for teachers can be twofold. On one hand, writing teachers needs to help students to view that texts are

purposeful and structured in patterns relating to certain contexts (Hyland, 2004b). On the other, grammar, texts and contexts are integrated as whole in the genre-based teaching, which helps learners make choices in creating meanings from vocabulary and grammar, relating to both the writing purposes and contexts (Hyland, 2004b).

9.2.1.3 Raising Students' Awareness of Using Thematic Structures and Evaluative Resources in Writing

Apart from adopting genre-based writing instruction within EAP context, it is also necessary to increase students' awareness of the appropriate choices they can make in using thematic structures and evaluative stances in organising academic texts. In one sense, using appropriate thematic structures for scientific knowledge could contribute to the distinctive feature of academic discourse as the site for logic reasoning. In addition, successful academic writing is inseparable from raising students' consciousness of potential audiences. This effect is construed through evaluative resources orienting writer-reader alignment within disciplinary discourse community, which highlights interactional and contextual features in academic texts. To achieve these ends, examples of authentic texts representing certain academic genres may be examined, by which institutionalised frameworks can provide assistance for students in making appropriate choices for creating meanings. The essential goal for this consciousness raising is to develop students' ability to identify and use 'the socially recognised discursive practices drawn on by full community members' (Hyland, 2004d: 148) in constructing their own academic writings. Both forms and functions in text organisation in a specific genre need to be delineated in an appropriate ways to assist accomplishing this goal.

9.2.2 Redesigning Syllabus for PhD Candidates

The present study is inspired by personal teaching experience in a Chinese university. Thus, the aim of this thesis is that the findings may offer some guidelines for future pedagogy and teaching syllabus. The preceding sections have handled the pedagogical implications within EAP context. This section will focus on syllabus redesign for PhD candidates.

As mentioned in Chapter one of this thesis, the current syllabus for PhD candidates in a Chinese university appears not to meet students' learning needs and university's publishing requirements for graduation. Specifically, the present PhD syllabus in the university is comprised of three compulsory components aiming for separate skill training, which involve listening and spoken English, reading and writing. It could be seen that this arrangement cannot satisfy the students' needs for academic publication for both career development and being awarded for the doctoral degree. Combined with the related deficiencies identified in the current study, it is suggested that a new syllabus for PhD candidates in this Chinese university has to be designed. It is advised that in a broad sense, the previous syllabus needs to be redesigned, consisting of compulsory and selective elements.

To assist PhD candidates' publishing needs, reading and writing should be united into an integrated compulsory course, whereas listening and spoken English could be taken as an optional course to improve their capacity for oral communication. These changes in the previous syllabus obviously accord with PhD candidates' needs for both academic publication and degree award. In the new syllabus, thus, combination of reading with writing has to be prioritised. Concerning classroom activities, collected published journal papers are distributed to PhD candidates,

followed by consciousness-raising procedures in which thematic structures and construal of interpersonal evaluative resources need to be examined. After arousing candidates' awareness of features and patterning of textual interaction and evaluative meanings in different sections of different medical genres, writing practice would be applied. Writing activities need to stress that there are three essential components for successful written communication, which incorporates writing purpose, certain context and intended reader. Considering the current study, these three elements in medical RA genre could involve in the presentation of relevant research background to be review. From literature review, research aims may be elicited to fill in the previous research gap, and predictive results are to be discussed and interpreted, generating the textual interaction between writers and potential readers. Given the review genre, the three main parts could be an overview of previous investigations on a certain academic area. This step may be accompanied by a detailed review of achievements and deficiencies. In the end, orientation for future studies may be suggested and advised. Based on the reformed syllabus, the objective of curriculum activities could be better realised, contributing to the success of academic publication.

In addition, learning to write within EAP context, it is argued, needs to involve collaboration between teachers and students, or between disciplinary experts and novice writers. In designing and organizing academic writing instruction, cooperation between language teachers and academic specialists in particular seems to be necessary (Flowerdew, 2000; Curry and Lillis, 2004). As Curry and Lillis argue that: '... the field of TESOL – EAP needs to bring multilingual writers' concerns and real life practices into the classroom A curriculum that focuses on situated practices, in addition to issues intrinsic to more language-oriented approaches, may significantly benefit and interest students' (2004: 683). Significantly, Flowerdew (2000) argues the

advantages of training sessions which emphasise the notion of discourse community and cooperation between both language and medical subject experts for successful academic publication. This type of training programmes could be added to the classroom activities designed for the new syllabus.

9.3 Limitations and Future Research

Motivated from personal teaching experience of seeing students' difficulties in constructing academic papers, the present study is expected to provide assistance in PhD candidates' academic pursuit during their candidature. To meet students' needs for publishing academic papers, this study is designed to concentrate on the investigation of thematic structures and evaluative stances in the Introductions and Discussions of two medical genres, which involve medical research articles and medical review articles. It is the first attempt which has ever been made to undertake study on both thematic organisation and evaluative stances in medical texts. Although some useful findings are uncovered for the future pedagogy, it is inevitable and understandable that there are some limitations to the present study. More detailed explorations need to be carried out in the relevant areas.

To have a good understanding of the features for textual organisation and intersubjective positioning in medical texts, future research needs to be carried out focusing on other textual sections, say, Methodology and Results. Secondly, to provide more effective assistance for pedagogical application within EAP context, investigations has to be extended to other academic genres. Finally, although some pedagogical implications and insights for future teaching and syllabus design have been suggested, this does not mean that the present research has answered all of the relevant questions arising from the students' writing practice. Pedagogical implications

and recommendations for syllabus design need to be put into practice to test whether they are plausible or not. Much work needs to be done in order to adapt the research findings into writing pedagogy and redesigning new syllabus for PhD candidates.

In spite of these limitations, it is hoped that the present exploration could provide some theoretical and applicable basis for future research in this area. More insightful outcomes might better equip with the writing pedagogy and syllabus within an EAP context, which to a greater extent, could meet NNS writers' needs and alleviate the pressure for publishing academic research.

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Appendix I

Titles of Published Professional Medical RAs

1. Adiponectin Attenuates Hypoxia/Reoxygenation-Induced Cardiomyocyte Injury Through Inhibition of Endoplasmic Reticulum Stress
2. Increased Expression of C-reactive Protein and Tissue Factor in Acute Coronary Syndrome Lesions
Correlation with Serum C-reactive Protein, Angioscopic Findings, and Modification by Statins
3. Alternative Use of Isoflurane and Propofol Confers Superior Cardioprotection than Using One of Them Alone in a Dog Model of Cardiopulmonary Bypass
4. Okadaic Acid Induced Neurotoxicity Leads to Central Cholinergic Dysfunction in Rats
5. Decreased CAMKII and PKC Activities in Specific Brain Regions are Associated with Cognitive Impairment in Neonatal Ventral Hippocampus-lesioned Rats
6. S14G-Humanin Ameliorates A β 25-35-induced Behavioral Deficits by Reducing Neuroinflammatory Responses and Apoptosis in Mice

Appendix II

Titles of Students' Draft Medical RAs

1. Globular Adiponectin Protects the Heart against Myocardial Ischemia/Reperfusion Injury by Normalizing Endoplasmic Reticulum Ca^{2+} -ATPase Function and Inhibiting Endoplasmic Reticulum Stress
2. Isoflurane Preconditioning Confers Cardioprotection by Activation of ALDH2
3. Application of the Plasma Level of High-Sensitivity C-Reactive Protein at 1 Year after Drug-Eluting Stent Implantation for Acute Coronary Syndrome
4. The Influence of HNG on Spatial Learning and Memory in $\text{A}\beta_{31-35}$ Injured Rats
5. Nec-1 Inhibited Okadaic Acid-induced Neurotoxicity in Rat's Cultured Cortical Neurons
6. Changes in Phosphorylated Level of CAMKII during LTP/LTD Induction and $\text{A}\beta_{25-35}$ -induced LTP Suppression in the Rat Hippocampus

Appendix III

Titles of Published Professional Medical Reviews

1. Dopamine-derived Endogenous *N*-methyl-*(R)*-salsolinol
Its Role in Parkinson's Disease
2. Diagnostic and Therapeutic Aspects of β_1 -adrenergic Receptor Autoantibodies in Human Heart Disease
3. The Cardiovascular Effects of GLP-1 Receptor Agonists
4. Myocardial Protection by Volatile Anesthetics in Patients Undergoing Cardiac Surgery: A Critical Review of the Laboratory and clinical Evidence
5. The IP_3 Receptor-mitochondria Connection in Apoptosis and Autophagy

Appendix IV

Titles of Students' Draft Medical Reviews

1. Mechanisms of Cardioprotection by Isoflurane against I/R Injury
2. Mitochondria and Myocardial Apoptosis
3. GLP-1 and GLP-1R Agonists Protect against Neurodegenerative Diseases
4. Role of β 1-adrenergic Receptor Signaling and Desensitization in the Heart
5. The Cell Model of Dopaminergic Neurons in Parkinson's Disease

Appendix V

Source Medical Journals

1. Neuroscience
2. Atherosclerosis
3. Journal of Investigative Medicine
4. European Journal of Pharmacology
5. Biochimica et Biophysica Acta
6. Journal of Cardiothoracic and Vascular Anesthesia
7. Cardiovascular Therapeutics
8. Autoimmunity Reviews
9. Neurotoxicity and Teratology
10. Neuropeptides