A Comparative Study of Shell Nouns in English Academic Writing by Chinese and Swedish Authors

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Abstract
This thesis aims to examine factors that influence the use of shell nouns in the writing production by Chinese and Swedish authors. Based on previous studies of shell nouns, this research establishes a theoretical model and a hypothesis is put forward: Though writing in the same genre, Chinese and Swedish authors have different ways of adopting shell nouns partially due to first language transfer. The verification of this hypothesis involves research samples from four corpora across two genres: Written English Corpus of Chinese Learners and Uppsala Student English Corpus made up of argumentations, and two self-established corpora composed of SCI research articles by Chinese and Swedish authors. It is found that in argumentative essays Chinese authors use significantly less shell nouns compared with Swedish authors and the lexico-grammatical patterns used by Chinese authors are not as diverse as those by Swedish authors. Whereas Chinese authors use the pattern the + N and this/that + N mostly, Swedish authors prefer the pattern the + N + that. As for the cohesive function, Swedish authors are more likely to use shell nouns to establish cataphoric reference. In research articles, however, the comparison shows that though Chinese authors still use significantly less shell nouns, especially cognitive shell nouns, the two groups of writers show no significant difference in choosing lexico-grammatical patterns, premodifiers or other classes of shell nouns. A qualitative analysis indicates that linguistic features including methods of texture, popularity of nouns, concrete and abstract dictions and sentence patterns result in the different use of shell nouns, which confirms the hypothesis. As the degree of difference is not the same in the two genres, a possible explanation is suggested: the genre “argumentation” has weak restriction compared with the genre “research article”. It is the difference in genre restriction that makes Chinese and Swedish authors adopt similar or diverse ways of using shell nouns. A pedagogical implication of this thesis is that language teachers should pay attention to the influence of genre in writing courses and conduct flexible teaching based on features of different genres.

Keywords: Shell nouns, academic writing, genre, first language transfer
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1. Introduction

This section introduces the study as a whole, including the research background of the study and purpose of the study.

1.1 Research Background

Introduced by Schmid in 1997, the term ‘shell noun’ has been frequently studied in recent years (see Yuan, 2006; Zhang and Zhang, 2007; Aktas and Cortes, 2008; Niu, 2012; Lou, 2013; Mousavi and Moini, 2014; Jiang, 2015c, 2016; Liu and Wang, 2016, among others). Some examples of shell nouns include fact, problem, type, method and issue. Other researchers are concerned with similar types of nouns “which overlap with the class of shell nouns or form a subgroup of them” (Schmid, 2000) and give these nouns different labels, such as general nouns (Halliday & Hasan, 1976), type 3 vocabulary (Winter, 1977), anaphoric nouns (Francis, 1986), enumerative nouns (Tadros, 1994), carrier nouns (Ivanič, 1991), metalanguage nouns (Winter, 1992), signaling nouns (Flowerdew, 2003), and stance nouns (Jiang, 2015a). Previous studies on shell nouns focus on various aspects, such as functions (Schmid, 2000), lexico-grammatical patterns (Liu and Wang, 2016), classifications (Jiang, 2016), premodifiers (Jiang, 2015a), and errors in using shell nouns (Niu, 2012). The data studied include master theses (Zhou and Liu, 2015), journal articles (Aktas and Cortes, 2008), argumentative essays (Flowerdew, 2006) and even dictionaries (Zhang and Zhang, 2007). Contrastive studies of shell nouns usually aim to compare people with different language proficiencies, like expert and novice writers (Aktas and Cortes, 2008), research papers in different disciplines, such as natural and social sciences (Jiang, 2016), or writing productions by native and non-native speakers of English (Zhou and Liu, 2015). However, to the set of the author’s knowledge, no papers have investigated the use of shell nouns by two groups of non-native speakers of English. Therefore, whether shell nouns are used differently in the English productions by writers from two non-English speaking countries remains unknown yet.

1.2 Purpose of the Study

Starting from the point discussed above, this study employs a corpus-based approach to compare the shell nouns used by English learners from China and Sweden. These two countries have been selected to represent, to a certain degree, English learners from Asia and Europe, or in other words, learners from the East and the West. The purpose of this study is to determine the factors that influence the use of shell nouns in the written-language
productions by Chinese and Swedish authors. To be more specific, this study aims to establish whether Chinese and Swedish authors tend to use shell nouns in a similar way or not, especially in the aspects of overall frequency, lexico-grammatical patterns, classifications, reference type, and premodifiers, i.e. the key issues for shell nouns.

In order to achieve this target, with the help of a theoretical model, this thesis puts forward the hypothesis that “Though writing in the same genre, Chinese and Swedish authors have different ways of adopting shell nouns partially due to first language transfer”. In order to verify this hypothesis, key issues for shell nouns used in four corpora consisting of two genres—argumentative essays and research articles—have been identified. By comparing not only the use of shell nouns by Chinese and Swedish authors in one genre, but also the distribution features of these shell nouns across the two genres, an attempt has been made to discover if first language and genre can influence the distribution of shell nouns and their interrelations.

2. Literature Review

This section first reviews previous studies on shell nouns. It includes an introduction to their definitions, identifications, lexico-grammatical patterns, classifications, premodifiers, and cohesive functions. Then, theories in genre analysis are presented, followed by theories in language transfer.

2.1 Studies of Shell Nouns

2.1.1 Definitions and Identifications

The notion of ‘shell noun’ was first coined by the German linguist Hans-Jörg Schmid in 1997, and is illustrated systemically in his monograph (Schmid, 2000). According to Schmid (ibid. p.4), “shell nouns make up an open-ended functionally-defined class of abstract nouns that have, to varying degrees, the potential for being used as conceptual shells for complex, proposition-like pieces of information”. Thus, the term ‘shell noun’ is only a convenient saying for “use-as-shell nouns” (Schmid, 2000, p.4). Shell nouns are difficult to define, because it is not their inherent properties but their functions that determine whether nouns can be regarded as shell nouns or not. Schmid (ibid. p.13) considers the property of shell-nounhood as a functional property and offers the following functional definition: “a noun is turned into a shell noun when a speaker decides to use it in a shell-content complex in the service of certain aims.”
From a grammatical point of view, the most striking feature of shell nouns is that they can be inserted in one or both of the two grammatical patterns presented below (Schmid, 2000). That is, any abstract noun that can be used in at least one of these two patterns may work as a shell noun.

1. Determiner + (Premodifier) + Noun + postnominal *that*-clause, *wh*-clause or *to*-infinitive

   *The (deplorable) fact that I have no money.*

2. Determiner + (Premodifier) + Noun + *be* + complementing *that*-clause, *wh*-clause or *to*-infinitive

   *The big problem was that I have no money.*

Adapted from Schmid (2000: 3).

2.1.2 Lexico-grammatical Patterns

Schmid (2000, p.21) points out that “it is vital for the communicative success of shell nouns that they are interpreted together with their content”. Such a “co-interpretation” is triggered by lexico-grammatical patterns speakers use to link shell nouns to their contents. Although studies concerning lexico-grammatical patterns of shell nouns are scarce, most of them focus on one or two of the potential patterns, such as “*this* + shell noun” or “shell noun + *that*”. Schmid (ibid.) is the first researcher who summarizes the most common lexico-grammatical patterns favored by speakers when using shell nouns, and most of the research papers published after his book are more or less based on his framework. In Table 2.1, four types of patterns are given, together with examples extracted from the COBUILD corpus. In the middle column, abbreviations for both the four general patterns and more specific variants are introduced.
Table 2.1. Lexico-grammatical patterns of shell nouns put forward by Schmid (2000)

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Abbreviation</th>
<th>Example of the general pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell noun + postnominal clause</td>
<td>N-cl</td>
<td>Mr. Bush said Iraq’s leaders had to face the fact that the rest of the world was against them.</td>
</tr>
<tr>
<td>Variants: that-clause</td>
<td>N-that</td>
<td></td>
</tr>
<tr>
<td>to infinitive-clause</td>
<td>N-to</td>
<td></td>
</tr>
<tr>
<td>wh-clause</td>
<td>N-wh</td>
<td></td>
</tr>
<tr>
<td>Shell NP + be + complementing clause</td>
<td>N-be-cl</td>
<td>The advantage is that there is a huge audience that can hear other things you may have to say.</td>
</tr>
<tr>
<td>Variants: that-clause</td>
<td>N-be -that</td>
<td></td>
</tr>
<tr>
<td>to infinitive-clause</td>
<td>N-be -to</td>
<td></td>
</tr>
<tr>
<td>wh-clause</td>
<td>N-be -wh</td>
<td></td>
</tr>
<tr>
<td>Referring item + (premod) + shell noun</td>
<td>th-N</td>
<td>(Mr. Ash was in the clearest possible terms labeling my clients as anti-semitic.) I hope it is unnecessary to say that this accusation is also completely unjustified.</td>
</tr>
<tr>
<td>Referring item as subject + be + shell noun (phrase)</td>
<td>th-be-N</td>
<td>(I won the freshmen’s cross-country.) That was a great achievement, wasn’t it?</td>
</tr>
</tbody>
</table>

Adapted from Schmid (2000: 22).

2.1.3 Classifications of Shell Nouns

One of Jiang's (2015b) contributions to the research on shell nouns is his proposition of a method which includes not only the interactive function of shell nouns, but also their interactional function. In his method, shell nouns are “functionally used either to mark entities, describe attributes of entities or discuss the relations between entities” (Jiang, 2015b, p.94). Table 2.2 presents the description of and examples for each category and sub-category. In the present thesis, Jiang’s classification is adopted as the standard to categorize shell nouns.
Table 2.2. Classification of shell nouns proposed by Jiang (2015b)

<table>
<thead>
<tr>
<th>Entity</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>object</td>
<td>concretizable meta-texts</td>
<td>essay, report, paper</td>
</tr>
<tr>
<td>event</td>
<td>events, processes, states of affairs</td>
<td>change, process, evidence</td>
</tr>
<tr>
<td>discourse</td>
<td>verbal propositions and speech acts</td>
<td>argument, claim, conclusion</td>
</tr>
<tr>
<td>cognition</td>
<td>cognitive beliefs and attitudes</td>
<td>Decision, idea, belief, doubt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>quality</td>
<td>traits that are admired or criticized, valued or depreciated</td>
<td>advantage, difficulty, value</td>
</tr>
<tr>
<td>manner</td>
<td>circumstances of actions and state of affairs</td>
<td>means, method, way, extent</td>
</tr>
<tr>
<td>status</td>
<td>epistemic, deontic and dynamic modality</td>
<td>possibility, trend, choice, ability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relation</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>cause-effect, difference, etc.</td>
<td>cause and effect, difference, relevance</td>
<td>reason, result, difference</td>
</tr>
</tbody>
</table>

Adapted from Jiang (2015b: 94).

2.1.4 Premodifiers of Shell Nouns

Premodifiers provide information on how speakers use shell nouns to convey their attitude and stance. Schmid (2000) classifies the adjectives occurring in front of shell nouns into five groups: descriptivve adjectives (e.g. unsuccessful/unprecedented), evaluative adjectives (e.g. terrible/tremendous), classifying adjectives (e.g. scientific/medical), restrictive adjectives (e.g. main/only), and cohesive adjectives (e.g. next/other). The difference between the two first groups is clear in general: descriptive adjectives express qualities of things and evaluative adjectives express the speakers' attitude towards things. The adjectives in the third group, classifying adjectives, are used to identify the class to which something belongs. Restrictive adjectives are borrowed from Quirk et al. (1985, p.430), who state that “restrictive adjectives restrict the reference of the noun exclusively, particularly, or chiefly”. The last group – cohesive adjectives – is based on Halliday and Hasan’s work (1976), in which such adjectives are means of creating cohesion.

2.1.5 Cohesive Function of Shell Nouns

Reference occurs when an item in a text cannot be interpreted semantically by itself, but by something else. According to Halliday and Hasan (1976), reference can be divided into endophoric reference and exophoric reference, and endophoric reference can be further divided into anaphoric reference and cataphoric reference. The interpretation of exophoric reference does not depend upon another expression in the text, but on the environment outside the text. While exophoric reference appears in a real situation, in written discourse
only endophoric reference is used. Anaphoric reference points to the history of the text, to a referent that has already been introduced in that text (Halliday, 2008), as in the following example: *Mike had a cat but he never played with it.* On the contrary, cataphoric reference points to a referent in succeeding text which is going to be introduced, as illustrated in the following example: *He could never have believed it. His friends have eaten the whole cake.*

One of the shell nouns’ functions is to create cohesion in written texts, as Charles (2003, p.314) describes: “they require lexical realization in their immediate context and they create cohesion”. The realization of shell nouns in the surrounding discourse is related to the concepts of encapsulation and prospection (Sinclair, 1992, 1993). Encapsulation “reclassifies a previous sentence by denoting it into an element of the new sentence” (Sinclair, 1993, p.8), while “prospection refers to the case in which a linguistic element leads the addressee (or reader) to expect something specific in the succeeding discourse” (Aktas and Cortes, 2008). To be more specific, encapsulation is similar to anaphoric reference and prospection is like cataphoric reference.

### 2.2 Genre Theory

#### 2.2.1 Genre and Discourse Community

Appearing in the 1980s, the notion of genre began to attract increasing attention in writing studies, especially in ESL (English as a Second Language) or EFL (English as a Foreign Language) writing (Qin and Uccelli, 2016). Swales (1990, p.58) defines genre as comprising “a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the discourse community, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style”. Discourse community was conceptualized by Swales (1990, p.55) as “a community that has a broadly agreed set of common goals and has mechanisms of intercommunication among its members”. According to Swales (1990, p.68), there are six defining characteristics within a discourse community, including:

1) It has a broadly agreed set of common public goals;

2) It has mechanisms of intercommunication among members;

3) It uses its participatory mechanisms primarily to provide information and feedback;

4) It utilizes and hence possesses one or more genres in the communicative furtherance of its aim;
5) It has acquired some specific lexis;

6) It has a threshold of members with a suitable degree of relevant content and discoursal expertise.

Though Swales argues that these criteria are necessary in a discourse community and he concentrates on the “common goals” of a specific genre, other researchers doubt his definition. For instance, Sun (2008, p.28) notes that “studies have shown that variations in discipline and culture may lead to differences in the formation of text structures as well as in their language manifestations”. Therefore, the theory of Generic Structure Potential (GSP) is cited in the following section as a complement to map the genre theory.

2.2.2 Generic Structure Potential

Halliday & Hasan (1985) defines GSP as an abstract category which describes all possible structures of a certain genre. Every genre has a GSP which contains both obligatory and optional elements and follows a certain sequence. While obligatory elements define a genre where a text belongs, optional elements bring the variation of different texts of the same genre. As illustrated in Figure 2.1, Yu (2001) presents how a GSP which can describe all possible texts is formed.

![Figure 2.1. The formation of Generic Structure Potential](Adapted from Yu (2001: 8)).

Genre is both an aspect and a product of cultural context (Zhang, 2012). Therefore, differences in obligatory elements, optional elements and the sequence in which they occur reflect the relation between language and culture. Due to the influence brought by cultural factors and text parameters, texts belonging to the same genre can be different from one another. This GSP theory complements Swales’ definition of genre to a certain degree, indicating “common goals” and “differences” are equally important when analyzing a genre.
2.3 Language Transfer

Since English learners have developed certain linguistic habits when acquiring their mother tongue, new linguistic habits will be influenced by the former ones when people try to learn a second language (Xu, 2001). The language transfer theory postulates that the acquisition of new knowledge is based on previous knowledge and that the completion of a former task will certainly influence the next learning task. There are three types of language transfer and their classification depends on the similarities and differences in the form, meaning and usage of the two languages learners face. The first type is positive transfer. It will occur when two learning tasks in two languages are the same, which will promote the formation of a new linguistic habit during second language learning. The second type is negative transfer, which can usually be found when two learning tasks in two languages present both similarities and differences. On this occasion, foreign languages users tend to replace the expressions and ways of understanding with that of their mother tongue, which will lead to harmful transfer in second language learning. The third type is zero transfer, which will appear when there is no connection between two learning tasks in two languages.

There are mainly three methods of classifying languages from all over the world: typological classification, areal classification and genetic classification (Huang, 1987). According to genetic classification, the three languages involved in this dissertation, that is Chinese, Swedish and English, belong to two of the biggest language families in the world: Sino-Tibetan languages and Indo-European languages. Chinese belongs to the Chinese group of Sino-Tibetan languages. Swedish belongs to the northern branch of the Germanic group of the Indo-European languages, while English belongs to the western branch of the same group.

Language users gradually realize that in order to master a foreign language, they need to understand the characteristics of that language, and the most efficient method to do so is to compare that language with their mother tongue (Lian, 2010). When language users are faced with complicated linguistic phenomena of a foreign language, resorting to their mother tongue may improve their language proficiency. It is possible, however, that their first language interferes with the acquisition of a second language. Since Chinese and Swedish belong to two different language families, these two languages have developed their own linguistic features. Chinese and Swedish authors inevitably bring the linguistic features of their respective mother tongues into the acquisition process of English, which will thus result in their interlanguage presenting these features.
3. Research Methodology

This section discusses in depth the methodology used in this study. It is divided into three parts. Section 3.1 presents a theoretical model established with the help of previous studies. Based on this model, a hypothesis is raised in section 3.2, and the research design aimed at testing this hypothesis is detailed. Section 3.3 introduces the four corpora under study and the data collection procedure.

3.1 A Theoretical Model for Qualitative Analysis

Since several theories are involved in this paper, a model was established and is presented in Figure 3.1 in order to show how these theories are combined together to comply with the present research objectives. First of all, due to the restriction of genre, common features in content and style are found in the same genre. However, because Chinese and Swedish belong to two different language families, large differences regarding their respective linguistic features prevail. Thus, these differences relating to linguistics are transferred into writing productions, resulting in the creation of various text types, as illustrated in Figure 3.1 below.

![Figure 3.1. The theoretical model adopted in this thesis](image-url)
3.2 Hypothesis and Research Design

With this theoretical model, several possible factors that can influence the use of shell nouns by Chinese and Swedish authors have been identified. Based on these factors, the following hypothesis was put forward:

**Though writing within the same genre, Chinese and Swedish authors have different ways of adopting shell nouns partially due to first language transfer.**

In order to test this hypothesis, the present thesis has adopted two sub-studies involving two different genres so as to ensure the validity of the analysis, which would not be the case with only one genre. The research data used in this thesis are argumentative essays and research articles written by Chinese and Swedish authors, which correspond to study-1 and study-2, respectively. Some key issues of shell nouns are searched and identified in the two sub-studies and the results are compared not only between the two corpora in one genre, but also across two genres. The hypothesis can be accepted as supported if the results meet the following two criteria:

a. Chinese and Swedish authors use shell nouns differently in both genres;

b. The differences in the shell nouns used by Chinese and Swedish authors can be explained by first language transfer.

It is worth mentioning that most attention will be paid to the differences in using shell nouns in the two genres instead of focusing on the similarities. The reason of this practice is that according to Swales’ definition (Swales, 1990, p.29), “there are common goals, participatory mechanisms, information exchange, community specific genres, a high specialized terminology, and a high general level of expertise” in discourse communities. Members of a specific discourse community indeed provide a rationale that determines the constraining conventions of the genre’s schematic structure, lexical and syntactic choice. Therefore, it is obvious that Chinese and Swedish authors share similarities in adopting shell nouns in their argumentative essays and research articles.

This study rather attempts to find factors that “break” conventions and produce various text types of a genre. Due to this reason, similarities in the use of shell nouns are considered as a normal phenomenon, and differences are regarded as useful evidences worthy of further investigation.
3.3 Corpora and Data Collection

3.3.1 Genre 1: Argumentations

Study-1 adopts argumentative essays as research samples. Two corpora made up of compositions by English majors from China and Sweden have been compiled. For the ease of description, these two corpora are called Chinese Corpus-1 and Swedish Corpus-1. Their respective characteristics are presented in Table 3.1.

Chinese Corpus-1 is extracted from the Written English Corpus of Chinese Learners (WECCL 2.0) (Wen, Q. F. et al., 2008). WECCL 2.0 is made up of 4,950 essays, including argumentations and expositions written by English majors and non-English majors. The total number of its tokens is 1,248,476, and argumentations written by English majors are the major part of this corpus. The Swedish corpus is extracted from of the Uppsala Student English Corpus (USE), which is made up of 1,489 compositions written by English majors, mainly freshmen, and includes argumentations, narration and short papers. The total number of tokens in USE is 1,221,265.

<table>
<thead>
<tr>
<th>Corpus</th>
<th>Number of texts</th>
<th>Number of tokens</th>
<th>Text type</th>
<th>Timed or untimed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Corpus-1</td>
<td>711</td>
<td>178,269</td>
<td>argumentation</td>
<td>untimed</td>
</tr>
<tr>
<td>Swedish Corpus-1</td>
<td>344</td>
<td>256,598</td>
<td>argumentation</td>
<td>untimed</td>
</tr>
</tbody>
</table>

In order to obtain objective and scientific research results, variables must be controlled to compare the two corpora, Chinese Corpus-1 and Swedish Corpus-1. Thus, except for their topic, the text type of the corpora has been selected to be almost identical, that is, untimed argumentations written by first-year English majors.

Five abstract nouns with the potential to be used as shell nouns have been selected—fact, problem, reason, effect and result. The reason of selecting these five nouns is that they have been identified as most frequently used shell nouns by Aktas and Cortes (2008). Only the singular form of these nouns is considered in this study. The data collection was mainly achieved by the concordance function of WordSmith Tools 6.0 (Scott, 2012), a corpus software. Firstly, the five nouns under investigation were searched one by one in the two corpora and each occurrence was read in order to exclude sentences without a shell noun. There were two motivations of doing this step. To begin with, words like result and effect can be used both as a noun and a verb, and therefore the occurrences of the verb form had to be excluded. Moreover, some occurrences of the selected nouns were not used in any lexico-
grammatical patterns and thus they did not function as shells. In other words, these nouns did not make any references. Take fact as an example. In example (1), the word fact is used in the phrase in fact, which does not belong to any specific pattern. This occurrence of fact is thus not regarded as a shell noun. In example (2) however, fact is used in the pattern “determiner + noun + post nominal that-clause”, which is why it is considered as a true shell noun. In the following text, words in bold indicate shell nouns while the underlined part marks the referent a shell noun refers to. Moreover, selected sentences are kept original with no spelling and grammar mistakes being corrected.

(1) As a future teacher I don’t see a point in reducing the subject studies, but in fact I consider the reduction to be a great threat that would lead to a radical lowering of the teachers’ competence and moreover the standard of the basic training at Swedish schools. (Swedish Corpus-1)

(2) By doing this, Johansson wants to remind the reader of the fact that Sweden is a democracy where the public has the power to express their meaning by voting in general elections. (Swedish Corpus-1)

Due to the different size of the two corpora, a comparison cannot be made directly. Thus, the total frequencies of shell nouns have been normalized to 100,000 words to conduct a more reliable comparison. Finally, the results were verified and the lexico-grammatical patterns of each shell noun were recorded. A significance test was applied through Log-likelihood Ratio Calculator (Liang et al., 2010) to examine whether there is a significant difference in the use of shell nouns by Chinese and Swedish students. A difference was accepted to be significant if p< 0.01.

3.3.2 Genre 2: Research Articles

Two corpora of 60 research articles written by Chinese and Swedish scholars have been compiled for study-2. These corpora are labeled Chinese Corpus-2 and Swedish Corpus-2. Their general information is presented in Table 3.2. In order to make sure the research results would not be influenced by disciplinary variation, the research areas of the articles in the two corpora and the number of texts in each area are the same.
Table 3.2. General description of Chinese Corpus-2 and Swedish Corpus-2

<table>
<thead>
<tr>
<th>Corpus</th>
<th>Number of papers</th>
<th>Number of words</th>
<th>Research areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>30</td>
<td>135,406</td>
<td>[Agriculture, Biology and Environmental Sciences;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Engineering, Computing and Technology; Physical,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chemical and Earth Sciences; Science and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Technology - Other Topics] (for both corpora)</td>
</tr>
<tr>
<td>Swedish</td>
<td>30</td>
<td>130,046</td>
<td></td>
</tr>
</tbody>
</table>

The research papers in the two corpora underwent a strict selection. First, the selected papers are all indexed by Science Citation Index (SCI), a citation index covering the world’s leading journals of science and technology, which ensure that the quality of these papers can be expected to be on the same level. As many of them are joint contributions by scholars from two or more countries and for the sake of minimizing first language transfer by scholars whose first language is neither Chinese nor Swedish, the author names in the Chinese Corpus were checked and only those papers written exclusively by Chinese authors were included. A native Swede was invited to do this step for the Swedish corpus. As scholars in Sweden prefer to adopt copy-editing services in preparation of publishing papers, resulting in a native-like version of their manuscript which may influence the validity of my comparison, a request letter was sent to the first authors of the previously selected papers to gather additional background information on their article. Based on the reply letters, only research papers that were not polished by any copy-editing services were included in Swedish Corpus-2.

With the help of WordSmith Tools 6.0, the two corpora were searched for the structures “noun + complement” structure and “noun + be + complement”, each including five specific structures following a shell noun: that clause, to-infinitive clause, of-prepositional clause, wh-clause and preposition plus wh-clause. This step was followed by a manual verification of the concordance lines. After identifying the different shell nouns, their frequency and lexicogrammatical patterns were listed and categorized according to Jiang’s taxonomy (Jiang, 2015b). Special attention was also paid to the premodifiers used before each shell noun, computing their frequencies and categorizing them based on Schmid’s classification (2000). Due to the different size of the two corpora, the frequencies of shell nouns were normalized to 100,000 words for a more reliable comparison. A significance test was applied through Log-likelihood Ratio Calculator (Liang, Li and Xu, 2010) to ascertain significant differences in the use of shell nouns by Chinese and Swedish scholars. A difference was accepted to be significant if p< 0.01.
4. Shell Nouns in Argumentations and Research Articles

This section is a quantitative analysis. It first introduces research results of study-1 and then it presents the quantitative results of study-2.

4.1 Overall Results in Argumentations

4.1.1 Frequency of Shell Nouns

In Chinese Corpus-1, the five selected shell nouns are used 149 times, with a normalized frequency of 83.58 per 100,000 words (see Table 4.1). Swedish students, however, make more use of shell nouns. In Swedish Corpus-1, shell nouns indeed occur 466 times, with a frequency of 181.61 per 100,000 words. The test of Log-likelihood Ratio confirms the significant difference between Chinese and Swedish argumentations in the overall use of shell nouns (LL =76.36, p=<0.001).

<table>
<thead>
<tr>
<th>Corpus</th>
<th>Times</th>
<th>Frequency in 100,000 words</th>
<th>LL value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Corpus-1</td>
<td>149</td>
<td>83.58</td>
<td>76.36</td>
<td>0.000</td>
</tr>
<tr>
<td>Swedish Corpus-1</td>
<td>466</td>
<td>181.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.1.2 Lexico-grammatical Patterns of Shell Nouns

Table 4.2 classifies lexico-grammatical patterns of the five shell nouns investigated in study-1, including the individual frequency of each lexico-grammatical pattern. It is worth mentioning that due to the limited space of this table, different clauses (e.g. to-infinitive clause or wh-clause) are all represented by that-clause. Not only all of the four general patterns put forward by Schmid (2000) occur in the two corpora, but three new patterns have been identified — a (an) + N, the + N and the + N + of. Examples (3) to (5) are unaltered excerpts from the two corpora.

(3) Moreover, by using extended opening hours at Systembolaget as a weapon against black trade, it will take a long time before the regained control over the alcohol trade is a fact. (Swedish Corpus-1)

(4) My opinion is that Sweden at present has a situation we can't handle in the communication between foreigners and those who have Swedish as a native language. I believe we must do something about this before the problem grows stronger and to reduce the number of entering foreigners for a few years can be one solution. (Swedish Corpus-1)

(5) The problem of not having the possibility to keep elderly people at home today is more
of a financial problem than a question of responsibility. (Chinese Corpus-1)

Table 4.2. The distribution of lexico-grammatical patterns of five shell nouns (per 100,000 words)

<table>
<thead>
<tr>
<th>Patterns</th>
<th>problem</th>
<th>reason</th>
<th>fact</th>
<th>result</th>
<th>effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
<td>S</td>
<td>C</td>
<td>S</td>
<td>C</td>
</tr>
<tr>
<td>1 a(an)+N</td>
<td>1.68</td>
<td>3.12</td>
<td>0</td>
<td>0.78</td>
<td>3.51</td>
</tr>
<tr>
<td>2 a(an)+N+that-clause</td>
<td>0.56</td>
<td>0.78</td>
<td>0</td>
<td>0.39</td>
<td>2.24</td>
</tr>
<tr>
<td>3 a(an)+N+be+that-clause</td>
<td>0</td>
<td>4.68</td>
<td>2.81</td>
<td>8.57</td>
<td>0</td>
</tr>
<tr>
<td>4 the+N</td>
<td>15.71</td>
<td>7.40</td>
<td>0.56</td>
<td>3.90</td>
<td>2.24</td>
</tr>
<tr>
<td>5 the+N+that-clause</td>
<td>0</td>
<td>0.78</td>
<td>8.42</td>
<td>7.40</td>
<td>6.74</td>
</tr>
<tr>
<td>6 the+N+be+that-clause</td>
<td>0.56</td>
<td>8.96</td>
<td>7.29</td>
<td>9.35</td>
<td>1.68</td>
</tr>
<tr>
<td>7 the+N+of</td>
<td>1.12</td>
<td>4.29</td>
<td>0</td>
<td>0.39</td>
<td>0</td>
</tr>
<tr>
<td>8 this/that+N</td>
<td>16.27</td>
<td>10.52</td>
<td>1.68</td>
<td>4.29</td>
<td>0.56</td>
</tr>
<tr>
<td>9 this/that+ be+N</td>
<td>2.81</td>
<td>8.96</td>
<td>1.12</td>
<td>4.29</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>38.71</td>
<td>49.49</td>
<td>21.88</td>
<td>39.36</td>
<td>13.46</td>
</tr>
</tbody>
</table>

C stands for China and S stands for Sweden.

In terms of the diversity of lexico-grammatical patterns used, with the exception of the shell noun result, Swedish students use more types of patterns than Chinese students. A difference is observed in the use of effect. The only type of pattern used by the Chinese students is the + N + of, while their Swedish counterparts use four different types. Similar observations can be made for problem, reason and fact. When using these three shell words, the Swedish students generally use two to three more kinds of patterns than the Chinese students. Moreover, Chinese and Swedish students tend to choose different patterns for the same shell noun. Indeed, as presented in Table 4.3, when students from the two countries use problem, the pattern this/that + N is the most adopted one and this similarity is also found with the use of shell noun fact. However, when using reason, result or effect, the students from the two countries prefer totally different patterns. For instance, when using reason, Chinese students adopt the + N + that - clause most frequently, but Swedish students prefer the + N + be + that - clause.

Figure 4.1 shows which pattern of shell noun is used mostly by Chinese and Swedish students. The favorite patterns of Chinese students are the + N and this/that + N, as illustrated in example (6) and (7). However, students from Sweden prefer the pattern the + N + that, the frequency of which is much higher than that of other patterns (see example 8). Fact is used most frequently in this pattern, taking up more than 75% of the total frequency.

(6) I do not agree the idea that traffic and housing problems in major cities would be solved
by moving big companies factories and their employees to the countryside. Because it can not solve the problem, on the contrary, the problem will be worse. (Chinese Corpus-1)

(7) Second, there are more and more young people who commit suicide. We all know that every one only have one life and know how valuable it is, but why some ones chose to end it. Many experts do a survey on this problem and the main reason is revealed - stresses. (Chinese Corpus-1)

(8) An interesting thing in this context is that the Swedish government already have acknowledged the fact that a child does not need parents of both sexes, as singles are actually allowed to adopt. (Swedish Corpus-1)

The least used pattern in Chinese essays is a (an) + N, whereas the pattern of lowest frequency for Swedish students is the + N + of, as illustrated in examples (9) and (10).

(9) Which skills are more important in learning English, reading or speaking? That's quite a problem that disturbs Chinese English learners. (Chinese Corpus-1)

(10) A part of the problem of youth unemployment today is that the young are never really let in to the labour market, they can neither get the experience or qualifications needed, and this would improve their CV for future job seeking. (Swedish Corpus-1)

![Figure 4.1. Distribution of lexico-grammatical patterns in the two corpora](image)

**Figure 4.1.** Distribution of lexico-grammatical patterns in the two corpora

Note: The numbers 1 to 9 stand for the nine patterns in Table 4.2.

### 4.1.3 Anaphoric Reference and Cataphoric Reference

The shell nouns used in the above patterns are mainly employed to perform cohesive functions in two manners: anaphoric reference and cataphoric reference. In the Chinese and Swedish corpora, anaphoric reference is related to patterns such as a (an) + N, this/that + N and this/that + be + N, as presented in examples (11) and (12). Cataphoric reference is
concerned with various kinds of patterns, including \( a (an) + N + \text{that-clause}, \) \( a (an) + N + be + \text{that-clause}, \) \( the + N + \text{that-clause}, \) \( the + N + of \) and \( the + N + be + \text{that-clause}, \) which are illustrated in examples (13) and (14).

(11) In countries where they still have death penalty people commit higher amounts of serious crimes than in countries that don’t have this punishment. I think that this fact proves that the capital punishment doesn’t work as a deterrent. (Swedish Corpus-1)

(12) People are getting fatter, that is a fact. (Chinese Corpus-1)

(13) Sweden started early with nuclear power and a reason was that our country had a lack of fossil sources such as oil and gas but had a large supply of uranium which is used as fuel in nuclear power stations. (Swedish Corpus-1)

(14) The problem is that immigrants do not necessary get the occupation they are qualified for. (Swedish Corpus-1)

The pattern \( \text{the} + N \) is a special pattern which can be used both in anaphoric reference and in cataphoric reference, as shown in (15) and (16) respectively:

(15) The problem is not always the lack of vacant jobs but the lack of well-educated people. (Chinese Corpus-1)

(16) There are no facts proving that the punishment of death prevents crimes. I think it only gives a false feeling of security, that something has been made about the problem. (Swedish Corpus-1)

The comparison of reference type is presented in Table 4.3. In Chinese Corpus-1, shell nouns are used as anaphoric reference 74 times in total, with a frequency of 41.51 per 100,000 words, and the figure for cataphoric reference is almost the same. In the Swedish corpus, shell nouns with anaphoric reference are used 109 times, with a frequency of 42.48 per 100,000 words. The frequency of cataphoric reference is about 3.3 times more than that of anaphoric reference, reaching 139.13 times in every 100,000 words. The test of Log-likelihood Ratio indicates a significant difference in the use of cataphoric reference between Chinese and Swedish students—with Swedish learners of English preferring cataphoric reference when using shell nouns (LL =111.62, \( p=<0.001 \)).
4.2 Overall Results in Research Articles

4.2.1 Distribution of Shell Nouns

a) Frequency

The research results show that, overall, the analyzed structures of shell nouns appear 164 times in Chinese Corpus-2 (120.7 per 100,000 words) and 214 times in Swedish Corpus-2 (164.23 cases per 100,000 words). This result is in accordance with that of Jiang (2015c), in which he obtains a frequency of 101 cases per 100,000 words for the “noun complement” structure of shell nouns in papers of hard sciences. As the present analysis includes both “noun + complement” structure and “noun + be + complement” structure, the frequency is slightly higher than Jiang’s but still within an acceptable range.

The normalized frequencies illustrate that Chinese authors do not use shell nouns to construct stance as frequently as Swedish authors do. The test of Log-likelihood Ratio confirms this significant difference: LL =8.81, p<0.01.

b) Selection of shell nouns

The most frequently used shell nouns in the two corpora were identified. The top 10 shell nouns in Chinese Corpus-2 are ability, fact, reason, potential, possibility, assumption, way, aim, capability and need. The top 10 shell nouns in Swedish Corpus-2 are possibility, ability, aim, assumption, fact, goal, hypothesis, importance, purpose and way. Six words overlap among the top 10 shell nouns, indicating that when using shell nouns, Chinese authors and Swedish authors seem to prefer similar words.

c) Range of shell nouns

A comparison was also made between the lexical range of shell noun types by calculating how many types of shell nouns occur at different cut-off points. For instance, the shell noun ability is identified 17 times in Chinese Corpus-2, thus belonging to the “16-20” group. The purpose of doing this categorization is to see whether authors from the two countries are more likely to use a large variety of shell nouns or employ the same shell noun repeatedly. As
presented in Table 4.4, the distributions of shell noun types in the two corpora are quite similar. Both Chinese and Swedish authors tend to use a large number of shell nouns once, especially Swedish authors. Shell nouns that are identified twice in the corpus rank second in the list for both corpora. Both Chinese and Swedish authors use only one shell noun 16 to 20 times and only one shell noun is identified in Swedish Corpus-2 more than 20 times, which means that rather than repeating the same word over and over, both groups use a large variety of shell nouns, although some are used only once.

Table 4.4. Range of shell noun types in study-2

<table>
<thead>
<tr>
<th>Range of shell noun types</th>
<th>Chinese Corpus-2</th>
<th>Swedish Corpus-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 20</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>16-20</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11-15</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>6-10</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>4-5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>39</td>
</tr>
</tbody>
</table>

4.2.2 Classes of Shell Nouns

When classifying shell nouns according to the function-based classification put forward by Jiang (2015b), both similarities and differences arise. Tables 4.5 and 4.6 describe the classification of shell nouns used in Chinese Corpus-2 and Swedish Corpus-2, respectively, along with the frequency for each category and sub-category and their percentages.
Table 4.5. The classification of shell nouns in Chinese Corpus-2 (with absolute frequencies)

<table>
<thead>
<tr>
<th>Classes</th>
<th>Shell nouns used in the corpus</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>object</td>
<td>case, characteristic, example, finding, issue, phenomenon, principle, task</td>
<td>67</td>
<td>40.8%</td>
</tr>
<tr>
<td>event</td>
<td>challenge, fact, proof, process, signal</td>
<td>14</td>
<td>8.5%</td>
</tr>
<tr>
<td>discourse</td>
<td>conclusion, question</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cognition</td>
<td>aim, assumption, determination, disagreement, focus, goal, hypothesis, key, objective, strategy, willingness</td>
<td>30</td>
<td>18.3%</td>
</tr>
<tr>
<td>Attribute</td>
<td></td>
<td>76</td>
<td>46.4%</td>
</tr>
<tr>
<td>quality</td>
<td>difficulty, importance, merit, problem, significance</td>
<td>10</td>
<td>4.7%</td>
</tr>
<tr>
<td>manner</td>
<td>condition, constraint, extension, method, way</td>
<td>14</td>
<td>8.6%</td>
</tr>
<tr>
<td>status</td>
<td>ability, capability, capacity, need, possibility, potential, probability, tendency, uncertainty</td>
<td>56</td>
<td>34.2%</td>
</tr>
<tr>
<td>Relation</td>
<td></td>
<td>21</td>
<td>12.8%</td>
</tr>
<tr>
<td>relationship</td>
<td>basis, clue, difference, purpose, reason, result</td>
<td>21</td>
<td>12.8%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>164</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.6. The classification of shell nouns in Swedish Corpus-2 (with absolute frequencies)

<table>
<thead>
<tr>
<th>Classes</th>
<th>Shell nouns used in the corpus</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>object</td>
<td>aspect, factor, finding, information, issue, notion, pattern, theory</td>
<td>107</td>
<td>50.0%</td>
</tr>
<tr>
<td>event</td>
<td>activity, attempt, challenge, drawback, evidence, fact, force, impact, indication, investigation, mechanism, process, support</td>
<td>32</td>
<td>15.0%</td>
</tr>
<tr>
<td>discourse</td>
<td>explanation, proposition, question, requirement, suggestion</td>
<td>12</td>
<td>5.6%</td>
</tr>
<tr>
<td>cognition</td>
<td>aim, ambition, assumption, doubt, goal, hypothesis, idea, intention, motivation, note, objective, point, prediction, strategy, understanding, view</td>
<td>53</td>
<td>24.7%</td>
</tr>
<tr>
<td>Attribute</td>
<td></td>
<td>91</td>
<td>42.5%</td>
</tr>
<tr>
<td>quality</td>
<td>advantage, disadvantage, importance, risk, strength</td>
<td>16</td>
<td>7.5%</td>
</tr>
<tr>
<td>manner</td>
<td>approach, condition, limitation, method, period, time, way</td>
<td>17</td>
<td>7.9%</td>
</tr>
<tr>
<td>status</td>
<td>ability, capability, capacity, chance, inability, necessity, need, possibility, potential, probability, trend</td>
<td>58</td>
<td>27.1%</td>
</tr>
<tr>
<td>Relation</td>
<td></td>
<td>16</td>
<td>7.5%</td>
</tr>
<tr>
<td>relationship</td>
<td>exception, ingredient, purpose, result, reason</td>
<td>16</td>
<td>7.5%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>214</td>
<td>100%</td>
</tr>
</tbody>
</table>
In order to have a clear and direct comparison, the frequency of each category is then normalized to 100,000 words, and a test of significance is conducted for each category. The entity class is the only class for which Chinese and Swedish authors differ significantly (LL =10.96, p<.01). However, with the exception of cognition nouns, Chinese scholars make similar use of object nouns, event nouns and discourse nouns as their Swedish counterparts. In Chinese Corpus-2, 67 cases of shell nouns fall into the entity class, including 14 cases of “object nouns”, 19 cases of “event nouns”, 4 cases of “discourse nouns”, and 30 cases of “cognition nouns”. In Swedish Corpus-2, 107 cases belong to the entity class, which accounts for 50% of the total number. The number of cases for each sub-category in this corpus is 10, 32, 12 and 53, respectively. The entity category in Swedish Corpus-2 is the largest one compared with the other two, which implies that authors from Sweden are more likely to describe the target itself when expressing their stance. The frequency of cognition words used by Swedish authors is 40.8 cases per 100,000 words, almost two times more than Chinese authors. However, both groups of authors use cognition nouns mostly in the entity class. Examples (17) to (19) illustrate the use of cognition nouns.

(17) Therefore, the **aim** of this study was to **explore relationships between SOM characteristics and its releasing effects on phenanthrene (PHE, as a representative of PAHs) sorption kinetics and capacity and discuss the mechanisms involved, by comparing results on rhizosphere sediment collected from lotus pond and a higher humified sediment in a previous report.** (Chinese Corpus-2)

(18) Another **idea** that Åslund et al. (2008) introduced is to **design a forming wire that only allows unidirectional flow and by that hinders rewetting from water that has already penetrated the sheet.** (Swedish Corpus-2)

(19) It should be emphasized, though, that the sole **motivation** for choosing this specific thermodynamic model is that it **gives good agreement with available data.** (Swedish Corpus-2)

In Chinese Corpus-2, 76 cases of shell nouns are found in the attribute class, accounting for 46.4% of the total occurrences. There are 6 cases of “quality nouns”, 14 cases of “manner nouns”, and 56 cases of “status nouns”. In Swedish Corpus-2, 91 cases belong to the entity class, which represents 42.5% of the total number. The frequency of cases for each sub-category is 16, 17 and 58, respectively. The attribute category in Chinese Corpus-2 is the largest among the three classes, indicating Chinese authors’ “propensity to express their attitudinal evaluation and value-laden judgment of entity's attributes” (Jiang, 2015b), as illustrated in examples (20) and (21).

(20) **Mild ice can reduce the airplane's flight performance, leading to the decrease of the**
airplane lift and the increase of resistance, which will cause the **difficulty** of controlling the flight attitude. (Chinese Corpus-2)

(21) Another **problem** encountered when solenoid valves are used is that there exists residual magnetism that lingers in the valve body after the power has been cut off, causing a delay in the closure of the valves. (Chinese Corpus-2)

In both Chinese Corpus-2 and Swedish Corpus-2, the status noun group represents the highest percentage in the attribute class. Seven shell nouns overlap in this group: *ability*, *capability*, *capacity*, *need*, *possibility*, *potential* and *probability*, taking a comparatively large percentage of the number of shell noun types in this group. Examples (22) and (23) below illustrate how some of these shell nouns are used.

(22) There was a **possibility** that the performance of the two-stage ejector was influenced by the axial position. (Chinese Corpus-2)

(23) The improved **ability** to determine the position of a prey by using multiple senses may allow for a longer strike distance, which should render a relative benefit to pike under extremely deteriorated visibility conditions where visibility is shorter than prey escape distances. (Swedish Corpus-2)

In 21 cases, relation nouns are used in Chinese Corpus-2, accounting for 12.8% of the total occurrence. In Swedish Corpus, 16 cases belong to the relation class (7.5% of the total number). The relation class is the smallest one compared with the other two in both corpora, indicating Chinese and Swedish authors are less likely to describe the relationship a target has with other items. Examples (24) to (27) present the use of relation nouns. It is worthwhile mentioning that the frequency of relation nouns in the Chinese corpus is 15.5 cases per 100,000 words, which is higher than in the Swedish Corpus (12.3 cases per 100,000 words). 3 shell nouns overlap in this group: *purpose*, *reason*, and *result*.

(24) Another **difference** was that the detonation waves initiated were transited from the deflagration waves propagating to the open end, the same as most of the traditional PDRE. (Chinese Corpus-2)

(25) The **purpose** with this paper is to investigate the relationship between packaging and the influence it has on marketing from a management point of view. (Swedish Corpus-2)

(26) Another **reason** may be the processing of the software that calculated the final results. (Chinese Corpus-2)

(27) This conclusion was remarkably well supported by the **result** that the removal ratio of NB was still 86.0% at pH 5.0. (Chinese Corpus-2)
4.2.3 Lexico-grammatical Patterns

As illustrated by Jiang (2015b), in the “noun + complement” structure and “noun + be + complement” structure, a shell noun is followed by “either in the form of that clause, to-infinitive, of-prepositional or preposition plus wh-clause”. However, according to the findings of study-2, a fifth pattern, in which a shell noun is followed by a wh-clause, has been identified. As illustrated in Figure 4.2, the two groups of authors use the five patterns mentioned above in a similar way.

![Figure 4.2](image)

**Figure 4.2.** Lexico-grammatical patterns of shell nouns in study-2

While that clause and to-infinitive clause are the most frequently used patterns by both Chinese and Swedish scholars, prepositions plus wh-clause are the least used. No significant difference is found in the selection of these five structures. Examples (28) to (33) are presented to illustrate the use of these patterns.

(28) This is due to the fact that the point were using the maximum allowed flow becomes disadvantageous appears earlier for larger particles. (Swedish Corpus-2)

(29) A fundamentally different approach is to capture contaminants in the gas stream in non-regenerative filtering and adsorption arrangements. (Swedish Corpus-2)

(30) First, if the goal is to minimize the total electricity cost and the maximum tardiness simultaneously, the problem of minimizing the total electricity cost for given maximum tardiness can be solved by using the modified insertion heuristic. (Chinese Corpus-2)

(31) One of the challenges is how to make use of the tremendous energy completely from the detonation wave. (Chinese Corpus-2)
(32) Therefore, we cannot make a conclusion whether a structural difference between the structures for proteins obtained from native and recombinant sources exists. (Chinese Corpus-2)

(33) But the crucial point for this specific business was how the packs would stand the very demanding voyage before ending up on the retailers’ shelves” says purchasing manager at the UK Confectionary. (Swedish Corpus-2)

4.2.4 Premodifiers of Shell Nouns

The premodifier of shell nouns, as introduced before in 2.1.4, is another aspect for analyzing how authors of scientific research papers convey their stance. The premodifiers identified in the two corpora are classified using Schmid’s (2000) framework, as presented in Table 4.7. The Log-likelihood Ratio Test establishes no significant difference between Chinese and Swedish authors.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Times in Chinese Corpus-2</th>
<th>Times in Swedish Corpus-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Evaluative</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Classifying</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Restrictive</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Cohesive</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>59</td>
</tr>
</tbody>
</table>

In the Chinese corpus, descriptive and evaluative premodifiers are most frequently used, both occurring 17 times. Similarly, Swedish authors employ the descriptive group most often (19 occurrences). Premodifiers in the descriptive group express qualities of objects. Words used in this group include biggest, higher, reduced, low, new and possible, etc. Examples of descriptive premodifiers are as follows.

(34) The ability to use both YOY and older fish, such as in the Larje River, may increase the reproduction potential of mussel populations, compared to a reduced ability to use more than one year class, such as in the Brattefors River. (Swedish Corpus-2)

(35) And then, Chen et al. (2010) tried to test 4A zeolite as the support for nZVI whether it had higher capacity to control iron loss during Fenton-like reaction process. (Chinese Corpus-2)
Evaluative premodifiers express the speakers’ attitude towards things. Examples in the corpora are *best, crucial, effective, greater, important, significant*, etc. Examples (36) and (37) show the use of evaluative premodifiers.

(36) Packaging and packaging design have therefore come increasingly to be seen by firms as an *effective way* of differentiating product offerings from those of competitors. (Swedish Corpus-2)

(37) An *important aspect* is to understand how customers are using the product and what type of value a new packaging solution can bring to customers. (Swedish Corpus-2)

The adjectives of the third group, classifying premodifiers, are used to identify the class to which something belongs. *Biochemical* and *physical* are two representative adjectives in this group, as in the following examples:

(38) The changes of NO and PGE2 in turn could be as *biochemical signals* to influence the function of downstream effector cells, like osteoblasts and osteoclasts. (Chinese Corpus-2)

(39) The logistic function includes the way a product travels from a producer to the consumer and the *physical requirements* that packaging must fulfill within the actual supply chain. (Swedish Corpus-2)

The frequency of this group of premodifiers in both corpora remains the lowest among the five groups. A possible reason for that finding is that the selected papers in both corpora are specialized in a certain area, such as biology and physics, and these papers actually have fixed target readers in that area, hence the unnecessary clarification of which class a shell noun belongs to.

According to Schmid (2000), the notion of restrictive premodifiers is borrowed from Quirk et al. (1985, p.430), who state that “restrictive adjectives restrict the reference of the noun exclusively, particularly, or chiefly”. Words in this group include *main, major, our, overall, sole, their*, etc. The two examples of restrictive premodifiers found in the corpora are illustrated below.

(40) To help the farmers to improve their adaptive *capacity* to promote sustainable agricultural development, governments should: Develop additional adaptation measures. (Chinese Corpus-2)

(41) The *main aim* of the change of material was to eliminate the slight flavour, but also to improve the environmental issues. (Swedish Corpus-2)
The last group is cohesive premodifiers, which includes words such as another, first, second and similar. This notion is based on Halliday and Hasan’s work (1976), in which such adjectives are means of creating cohesion in research papers. The use of these adjectives is illustrated below.

(42) Another example is that nitration of tyrosine 10 critically enhanced amyloid β (A β) aggregation and plaque formation which contributed to Alzheimer’s disease (AD) pathology. (Chinese Corpus-2)

(43) A second aim was to compare the time- and cost-efficiency of the two methods. (Swedish Corpus-2)

5 Qualitative Analysis

This section is a qualitative analysis of previous results. It offers explanations for the differences found in the two sub-studies from the perspective of first language transfer. Then, the restriction of genre, which includes weak and strong versions, is discussed in detail.

5.1 Differences Caused by First Language Transfer

5.1.1 Methods of Texture

One of the important functions of shell nouns is to establish cohesion in a text by certain lexico-grammatical patterns (Aktas and Cortes, 2008). This kind of cohesion is explicit, and mainly relies on grammar and cohesive markers. However, the Chinese language usually centers on semantics and relies on the content of a text to be cohesive (Cai, 2006). This is what is called parataxis. As one of the Indo-European languages, Swedish (as well as other Germanic languages) mainly use hypotaxis to establish cohesion. Under this circumstance, it would make sense if as a way of establishing cohesion, shell nouns were used less by Chinese scholars than by their Swedish counterparts.

In Example (44), two sentences are given. (a) offers the Chinese translation of the English sentence It is no problem that he has gone, the phonetic transcription and meaning of every Chinese character or phrase. In (b), the Swedish translation of the same English sentence and the meaning of every Swedish word are provided. From this example, it can be seen that Swedish has a very similar method of texture as English: they both use hypotaxis to organize a sentence. Chinese, however, adopts a completely different method: people always rely on meaning to connect several clauses together.
(44): It is no problem that he has gone.
(a) 他走了，不用问题。
     Ta zou le,  mei wenti.
     He go TENSE MARKER, no problem.
(b) Det är inget problem att han har gått.
     It is no problem that he has gone.
(Note: This is not part of the corpora.)

5.1.2 Popularity of Nouns

When an abstract noun is inserted in a certain lexico-grammatical pattern, this noun can be considered as a shell noun (Schmid, 2000). As there is no specific category for shell nouns in the grammatical system of English and as the specific context is needed to determine whether an abstract noun is a shell noun or not, the term ‘abstract nouns’, instead of ‘shell nouns’, is used for some of the comparisons made in the present analysis, shell nouns being included in the category of abstract nouns.

Although abstract nouns exist in both Chinese and Swedish, their frequencies are not the same. In Chinese, abstract nouns are fewer than in languages of the Indo-European family. In old Chinese, not many words were real abstract nouns (Cai, 2006). The phenomenon that more abstract nouns exist in Indo-European languages whereas fewer in Chinese is transferred into the English learning process, leading to positive transfer for Swedish authors and negative transfer for Chinese authors. It is the first reason why authors from the two countries have differences in using shell nouns.

Secondly, sentence structures of Indo-European languages are suitable for using abstract nouns. No matter how much content a sentence delivers, one finite verb is usually enough. Phrases and clauses containing non-finite verbs follow the main sentences through grammatical relationship (Cai, 2006). This kind of sentence structure is very suitable for using abstract nouns and phrases containing abstract nouns. On the contrary, Chinese sentences are mostly formed by chronological order or logical order, and center on the verbs. Noun phrases do not conform to the Chinese habits of expression.

Example (45) is used to illustrate this point. In the Chinese translation, five finite verbs, belonging to the same level, are employed. However, in the original English sentence, one finite verb and four non-finite verbs are used, belonging in fact to two levels. The sentence structure of Swedish is nearly identical to English, and is suitable for using nouns.
To promote economic growth and maintain social stability, we must take the opportunity to deepen the reform and open China wider to the outside world.

(a) 我们必须抓住机遇，深化改革，扩大开放，
促进发展，保持稳定。

We must take opportunity, deepen reform, expand openness, promote development, maintain stability.

(b) För att främja ekonomisk tillväxt och bevara social stabilitet,

must we take opportunity and deepen reform and open China wider for world outside.

Adapted from Example 7(a) and 7(b) in Cai (2006: 260, 263).

Moreover, negative sentences in Chinese are usually achieved by *not* that is attached to verbs. A negative sentence developed by abstract nouns is not correct. Last but not least, many Indo-European languages have a highly developed system of prepositions, which create conditions for the use of abstract noun structure. In Chinese, the number of prepositions is comparatively smaller, limiting the use of abstract nouns through grammar (Cai, 2006). Writers thus transfer the diversity or lack of abstract noun structures from their mother tongues into the English language, which could explain the differences in frequency of the shell nouns and shell noun patterns they use.

### 5.1.3 Concrete and Abstract Dictions

Chinese authors are used to concrete diction whereas Swedish authors are used to abstract diction, and nouns often lead to the abstraction of language expression. Reasons for concrete expression to be more favorable in eastern nations when abstract expressions are popular in western nations are summarized as follows (Lian, 2010). Firstly, the philosophical background of Chinese language is a comprehension of Confucianism, Taoism, and Buddhism. This comprehension needs to be specific, so Chinese people are good at concrete diction. On the contrary, western people are good at abstract diction and theoretical research on it since ancient times, so they are experts in using abstract expressions, like shell nouns. Secondly, Chinese is an imagery language, the written symbols of which are pictographic, meaningful, and phonographic. Compared with Chinese, the writing system of Swedish is merely phonographic, so the Swedish writing system is a more abstract one. Thirdly, Indo-
European languages have a rich system of affixes. By adding affixes, a word can be easily changed into another with a different part of speech. That is, prefix and suffix provide convenience for abstract expressions. However, in Chinese, affixes are scarce, and it is not easy to change a concrete word into an abstract one. Therefore, because of the concrete diction of Chinese, shell nouns are usually neglected.

5.1.4 Run-on Pattern and Hierarchical Structure

The run-on pattern is a typical sentence pattern in Chinese. The formation of such a sentence pattern is similar to the stream of consciousness: one clause is followed by another and by another, which can be endless. Influenced by this linguistic feature, English sentences created by Chinese authors usually present this run-on pattern. Several short simple sentences are indeed connected together by and or a comma, which can be considered as a linear structure (Cai, 2006). On the other hand, sentence structure in Indo-European languages is hierarchical. The top level of this hierarchical structure is the subject and finite verb, which usually consists of the main clause, and relatives, prepositions, connectives, and participles are used to embed phrases and clauses to that main clause. This can, in a way, explain why Chinese and Swedish students prefer two different types of shell noun patterns in their argumentations.

(46): As a teacher richly endowed with a generous heart and a noble mind, he was widely admired by his students for his genuine devotion to education.

(a) 他 是 一个 老师， 胸怀 宽广， 思想 高尚， 能
Ta shi yige laoshi, xionghuai kuanguang, sixiang gaoshang, neng
He be a teacher, heart generous, mind noble, can

真正 的 献身 于 教育 事业， 受到 了 学生
zhenzhengde xianshen yu jiaoyu shiyue, shoudao le xuesheng
truly devote to education career, receive tense marker student
们 广泛的 赞赏。
men guangfan de zanshang.

(b) Som läsare rikt begåvad med ett generöst hjärta och ett ädelt sinne,
As teacher richly gifted with one generous heart and one noble mind,

beundrades han mycket av sina studenter för sin genuina hängivenhet för
was admired he much by his students for his genuine devotion for
undervisning.
education.

Adapted from Example (4) in Cai (2006: 252, 253).
Example (46) distinguishes the run-on pattern (a) and hierarchical structure (b). In the Chinese translation, the small clauses have no grammatical connections with one another and are connected by the same sentence topic. Each small clause is very short and the author can prolong this sentence without considering its structure. The original English sentence and the Swedish translation both have a hierarchical structure, resulting in each of the small clauses to be connected closely with one another and to be embedded in the main clause. The shell noun patterns the+N and this/that+N are mostly used by Chinese students. They are typical minor sentence patterns, by which run-on sentences and linear sentences are usually produced. However, Swedish students prefer the pattern the+N+that, by which long and complicated hierarchical sentences are usually achieved.

5.2 Restriction of Genre

5.2.1 Weak Restriction of Argumentations

It is interesting to note that the results of study-1 and study-2 indicate that Chinese and Swedish authors adopt different ways of using shell nouns in their argumentative essays but become quite similar in research articles. In other words, the degree of difference in employing shell nouns changes as the genre changes. A possible explanation is that though genre has the function of restricting the content and style of writing productions, the restrictions imposed by different genres are not equal. Based on the results of study-1 and study-2, the genre of “argumentative essay” is considered to present weak restrictions compared with the genre of “research article” which is thought to have stronger restrictions.

Merriam-Webster Dictionary (2017) defines argumentation as “the act or process of giving reasons for or against something” or “the act or process of making and presenting arguments”. Argumentative essays are indeed used to present an opinion to the reader and to explain, clarify and illustrate that opinion. The purpose of this genre is to persuade readers to accept the writer’s opinions in regards to a particular topic. Therefore, the nature of this genre brings with it a potential diversity of argumentation both in content and style. Take the structure of argumentative essays as an example. Based on the writing purpose and strategy of argumentative essays, Coffin (2004) summarizes four types of structures which are mostly adopted: hortatory exposition, analytical exposition, hortatory discussion and analytical discussion (Liu and Li, 2017). Thus, there is no fixed requirement for the structure of argumentation, and the style of writing is quite flexible.

Moreover, the distinction between “reader responsible culture” (Hinds, 1987) favored by the East and “writer responsible culture” (Hinds, 1987) favored by the West is another factor that
further weakens the restriction of argumentation. Table 4.8 displays the differences between writer responsibility and reader responsibility.

<table>
<thead>
<tr>
<th>Writer responsible</th>
<th>Reader responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear</td>
<td>flowery</td>
</tr>
<tr>
<td>concise</td>
<td>ornate</td>
</tr>
<tr>
<td>action-oriented</td>
<td>subject-oriented</td>
</tr>
<tr>
<td>practical</td>
<td>theoretical</td>
</tr>
<tr>
<td>deductive</td>
<td>quasi-inductive</td>
</tr>
</tbody>
</table>

Adapted from Coffin (2004: 2).

“Writer responsibility is when the burden of communication is on the writer” (McCool, 2009). This type of culture emphasizes a deductive way of reasoning which uses “an AB to BC to CD pattern”. Therefore, it is also called “parallel progression”. On the contrary, the burden of communication in reader responsible cultures is on the reader: “An inductive or quasi-inductive line of reasoning” (McCool, 2009) is required in this type of culture. Such cultures use “an AB to CD to EF pattern” which is also called “sequential progression”. Previous studies (e.g. Kaplan, 1966, 1987, 1988) show that the above cultural factors indeed affect the English writing by writers from the East and the West. Without strict conventions to follow, cultural differences could play a more decisive role than genre in writing styles.

English teachers’ lack of awareness of the genre-based teaching approach can make the restriction of argumentation even weaker. Qi (2011) points out that the teaching syllabus used for English majors in China has a vague requirement of teaching stylistics. The training of linguistic competence rather than thinking ability has always been the tendency of English teaching in China (Zhang, 2010). Therefore, students in China tend to neglect the nature of argumentative essays in writing, which in turn lowers the restriction on argumentation.

5.2.2 Strong Restriction of Research Articles

Research articles, especially those published by international journals, have to follow conventions and restrictions, not only of the genre but also regarding the style required by journals. In academic writing courses, language teachers offer students published papers as references to imitate as those articles are accepted by expert reviewers in certain fields and are considered to be of excellent quality in both content and language.

The role of a conventional model is so important that it could smooth over the writers’ not so perfect language skills, as Glasman-Deal (2010, p. vii) notes:
When your language skills are not perfect, organizing your information in a conventional way and using conventional language are very important. If you write according to a conventional model, the reader knows what you are trying to do because the model you are following is familiar, and language errors are therefore less significant.

Original research articles have adopted a very standardized structure since the first half of the 20th century, known as “introduction, methods, results, and discussion” (IMRaD or IMRD). In a cross-sectional study, Sollaci and Pereira (2004) found that in journals of health science, this structure “began to be used in the 1940s...and, in the 1980s, was the only pattern adopted in original papers.” The IMRD structure is now regularly applied in academic journals across a wide range of disciplines, though originally it was adopted mainly in hard sciences. Several submission guidelines for research articles from Chinese Corpus-2 and Swedish Corpus-2 were searched and most of their “Instruction for Authors” recommend the IMRD structure. The journal Aquatic Sciences puts the instruction of general structure as follows:

We suggest that these manuscripts include an “Abstract”, an “Introduction”, a “Materials and Methods” section, a “Results” section and “Discussion”. The “Discussion” section should include the special mention of the significance of the work to the field of aquatic sciences. The “Results” and “Discussion” sections may be combined as “Results and Discussion”. Each section may contain subsections. Deviation from this general style is permitted if it improves the clarity of presentation.

The plot of IMRD structure, demonstrated in the “wine glass model” (see Figure 4.3), has two characteristics. The first one is the “top-bottom symmetric shape” and the second one is the “changing width” i.e. “the top is wide and it narrows towards the middle, and then widens again as it goes down toward the bottom” (Glasman-Deal, 2009, p.2). With such strict conventions for research articles, the restriction of this genre is quite strong, and therefore, similar texts are produced within the same genre.
6 Conclusions

Based on the analysis and discussion in the previous chapters, the last section draws a conclusion on the research findings of the two sub-studies. Implications and limitations of the current study as well as suggestions for further studies are also presented.

6.1 Findings of the Thesis

The purpose of this thesis has been to determine factors that influence the use of shell nouns in the writing production of Chinese and Swedish authors. With the help of a theoretical model, this thesis has put forward the hypothesis that “Though writing in the same genre, Chinese and Swedish authors have different ways of adopting shell nouns partially due to first language transfer.” In order to verify this hypothesis, key issues of the use of shell nouns in four corpora across two genres have been explored. The findings include:

1. In argumentative essays, Chinese and Swedish students tend to adopt shell nouns in quite different ways. To begin with, there is a significant difference between Chinese and Swedish essays in terms of the overall frequency of shell nouns. Compared with the Swedish students, Chinese students use significantly less shell nouns. Moreover, writers from the two countries present differences in their choice of shell noun patterns in two aspects. Firstly, the lexico-
grammatical patterns used by the Chinese students are not as diverse as the ones used by the Swedes. Secondly, whereas Chinese students use the pattern *the + N* and *this/that + N* mostly, the Swedes prefer the pattern *the + N + that*. Regarding the cohesive function, there is also a significant difference in the use of cataphoric reference between the Chinese and Swedish students: the latter are more likely to establish this kind of cohesion.

2. Exploring the distributional features, classes, lexico-grammatical patterns, and premodifiers of the shell nouns used by Chinese and Swedish scholars in their research articles shows that, though differences still exist, Chinese and Swedish scholars present many similarities when using shell nouns in academic papers. The results indicate that, in general, Chinese use significantly less shell nouns than their Swedish counterparts, especially in the cognition group, but there is no significant difference between the two groups of authors in other issues of shell nouns.

3. While similarities can be explained within genre theory in that members in a specific discourse community provide a rationale that determines the constraining conventions of the genre’s schematic structure and lexical and syntactic choice, reasons for the differences across the two corpora are offered from the perspective of first language transfer and cultural differences. While Chinese scholars are used to establish parataxis in texts, Swedish authors are more likely to use hypotaxis. Moreover, in Chinese, concrete diction is preferred whereas abstract diction is favored in languages of the Indo-European family. Another different linguistic feature is that run-on and linear sentences are usually preferred in Chinese. However, Swedish prefers long and complex hierarchical sentences. This difference explains why the two groups of writers use different lexico-grammatical patterns of shell nouns.

4. Although the results of both study-1 and study-2 support the hypothesis that “Though writing in the same genre, Chinese and Swedish authors have different ways of adopting shell nouns partially due to first language transfer”, the degree of difference is not the same in the two genres. A further exploration indicates that these two genres do not have equal restriction. The genre “argumentative essay” is considered to have weak restrictions compared with the genre “research article”. This difference in restriction brings Chinese and Swedish authors to adopt similar or diverse ways of using shell nouns.

6.2 Implications of the Thesis

6.2.1 Theoretical Implications

The first implication of this thesis is the comparatively innovative method for choosing research samples. To date, no studies of shell nouns adopt writing productions by non-native
English speakers from two countries in order to highlight their similarities and differences in using shell nouns. Therefore, this study can not only complement previous studies in the field of academic writing and comparative linguistics, but also provide an additional possible aspect for the study of shell nouns.

Furthermore, instead of raising several research questions, this thesis has put forwards a hypothesis and has designed two sub-studies to test it. Such a research design is usually adopted in experimental studies in linguistic research. With few studies to follow in the field of English for Academic Purposes, the present dissertation offers a comparatively new approach to research design in this field.

Thirdly, the theoretical model established in this thesis can be used for future studies. One advantage of this model is that it is not constrained to shell nouns, but also to other grammatical features in English writing. As this model involves genre analysis, it can also be adopted to analyze English writing in different genres.

6.2.2 Pedagogical Implications

The findings of this thesis illustrate that conventions of a genre, first language transfer and cultural aspects all influence the use of shell nouns in writing. Therefore, language teachers, especially those who teach non-native speakers of English, should be aware of these factors and ask students to pay special attention to the schematic structure, as well as their lexical and syntactic choices in research articles.

Language teachers can use the examples selected from authentic research papers to teach students who do not know how to employ shell nouns in a proper way. In academic writing courses, explicit instruction is necessary to demonstrate that shell nouns in different categories are used to mark entities, describe attributes or discuss the relations, and to show what specific items can be selected in each class. Various tasks to improve the students’ awareness to teach lexico-grammatical patterns of shell nouns can be of great use as well.

6.3 Limitations and Suggestions for Future Research

One of the limitations of this thesis is that the data collected in study-1 and study-2 is not analyzed using the same aspects as they were originally two separate studies. Study-1 analyzes the shell nouns' overall frequency, lexico-grammatical patterns and cohesive functions, while study-2 focuses on their overall frequency, classification, lexico-grammatical patterns and premodifiers. Though the comparison is mainly carried within the same genre, it is recommended that researchers collect data that allows to investigate the same issues of shell nouns in both genres, which is useful for a cross-genre comparison.
The size of Chinese Corpus-2 and Swedish Corpus-2 may have been another limitation for this thesis. The small size of my corpora—30 research papers in each corpus—has influenced the final results of study-2, especially the overall frequency of shell nouns in both corpora, as a large number of shell nouns identified in both corpora appeared only once. Thus, a more reliable comparison could be achieved if the two corpora were to be enlarged.

The strong and weak versions of restriction discussed in this thesis are just a preliminary observation. In order to verify restriction as a factor, more studies are needed. Therefore, researchers might design a series of experiments aimed at investigating the restriction of different genres in the future.
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