



# A Corpus-Based Analysis of Nominalization in English Abstracts of Sci-Tech Papers by Chinese Authors and Native English Authors

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## Abstract

Nominalization is a typical feature of abstracts of academic writing as it can maintain an objective tone and create textual cohesion. For Chinese authors aiming to publish their work in academic journals, understanding how to effectively use nominalization in abstracts is essential. This paper, based on the theoretical framework of Halliday's Grammatical Metaphor, investigates the nominalization uses in English abstracts of sci-tech articles written by Chinese authors and by native English authors, hoping to provide insights for Chinese scholars to improve their ability to read and write abstracts in this field. After making a contrastive statistical analysis of the use and frequency of nominalization between the two groups, the results show that there exist significant differences both in the general use of lexical and clausal nominalizations. Therefore, we come to the conclusion that Chinese authors may not apply nominalizations as proficiently as native English authors do, which can hinder their ability to express their ideas clearly.

## Subject Areas

Linguistics

## Keywords

Comparative Study, Corpus Linguistics, English Abstract Writing, Nominalization

## 1. Introduction

With the development of globalization, international academic exchanges are becoming more frequent. In the current era of rapid technological development,

scientific research is advancing at an unprecedented pace, leading to an exponential growth in the quantity of scientific and technical articles. Universities, research institutions, and enterprises alike place significant emphasis on both the quality and quantity of scientific publications. Presently, China has emerged as the leading producer of scientific and technical articles in terms of sheer volume. Since scholars in different countries use different languages, a good translation of scientific and technical articles has a great impact on academic communication, for the purpose of research and spreading technologies. Abstract always appears at the beginning part, acting as the point of entry for any given academic paper (Hartley, 2003 [1]; Salager-Meyer, 1990 [2]). Abstract, being the condensed section of research articles, encompasses a wide array of information, such as research objectives, methods, results, and even implications and suggestions [3] [4]. In other words, an abstract, to some extent, is the summary of a research paper and is of great significance in paper presentation and academic exchange. However, it is worth noting that the quality of these abstract translated versions varies significantly. While some translations exhibit a high level of quality, others fall short. Certain expressions in the Chinese version do not adhere to authentic English language conventions, resulting in obscurity and difficulty in comprehension. Furthermore, some translations even contain errors that deviate from the intended meaning of the source language. Scientific and technical texts, being a distinct form of the English language, demand clarity in both language expression and grammar, ensuring a coherent and fluid reading experience.

One prominent feature observed in the abstracts of sci-tech articles is the frequent use of nominalization. However, the utilization of nominalization can pose challenges to article comprehension and consequently lead to inferior translated versions. Moreover, nominalization, within the framework of grammatical metaphor theory, exhibits a shifting mechanism and serves distinctive functions in terms of language metafunctions due to its inherent incongruity.

Since nominalization plays a key role in the abstracts of sci-tech articles, this paper focuses on the quantitative and qualitative analysis of instances of nominalization in corpora consisting of Chinese-English and English abstracts of sci-tech articles from several disciplines.

## **2. Literature Review**

### **2.1. Studies on Normalization**

Since the distinction of the part of speech is the unlimited common feature of human language, it is easy to see the conversion among various parts of speech. That is why so many scholars are crazy about studying the part of speech. And, being one of the most basic features of language, the phenomenon of nominalization attracts more and more attention.

According to research on academic and written language, nominalization plays a pivotal role as the primary lexico-grammatical feature [5] [6]. By con-

verting actions or processes into conceptual forms, it introduces abstract meanings, consolidates information within nominal groups, minimizes clause usage, and fosters a concise writing style that aligns well with the principles of scientific writing [7].

The phenomenon of English nominalization was first discussed in Jespersen's (1924) *The Philosophy of Grammar*. From then on, linguists have been analyzing nominalization from different approaches [8].

In structural linguistics, the issue of English nominalization was brought to light primarily by the contributions of the Prague School (and mainly by its founding figure Vilem Mathesius). Mathesius (1975 [1961]) first applied 'complex condensation of the sentence' to mean an introduction into a sentence of a nominal element or phrase replacing the finite verb of a subordinate clause and thus avoiding using a clausal structure. He concluded that the most frequently used sentence condensers in English are the present participle, infinitive, and gerund [9]. Radovanovic (1978) developed an elaborate model of Mathesius' theory and used it for prediction analysis. He improved the analysis of English nominalization from the perspective of the sentence and first investigated at the semantic-syntactic level nominalization as adverbial, actualizing a wide range of meanings (including temporal, causal, purposive, conditional, and concessive meanings), then considered the formal-syntactic level nominalization in the position of subject (as a condenser of nominal "that"-clauses and adverbial clauses) and object (as a condenser of finite clausal structures), as an integral part of periphrastic predicate structures, as a constituent member of the nominal predicate, and as the basic predicational nucleus (in absolute use) [10]. Casule (1989) adapted Radovanovic's improved model of Mathesius' theory and applied it to analyze the functioning, meaning, and structure of the verbal noun (non-finite verbal forms ending in "-nje") in the modern Macedonian literary language, as one of the representatives of the process of condensation and nominalization. He found that the verbal noun is the central, highly regular, and most productive condensed exponent of the process of nominalization [11].

In cognitive linguistics, Langacker (1991, p.22-50) made a special investigation of English nominalization from three main aspects: "kinds", "periphrasis", and "predictability" [12].

In systemic-functional linguistics, Halliday carried out a more systematic and in-depth study of English nominalization in relation to context. Halliday (1994, p.352) [13] defined it as "It serves as an unparalleled tool for crafting grammatical metaphors". It is a mode marker of written English rather than spoken English in the sense that written English is characterized by "complexity in the nominal group", while spoken English is "marked by intricacy in the clause complex" (Halliday, 1987, p.71) [14]. To sum up, in view of the previous studies on English nominalization, this paper intends to conduct a corpus-based study of the use of nominalization in English translations of Chinese abstracts of sci-tech articles and compare the results of its use with those of the use of nominalization in English abstracts of sci-tech articles.

## 2.2. Studies on Abstract of Sci-Tech Articles

Abstracts as a specific genre in its own right (Lorés, 2004) have their widely-acknowledged significant roles and functions in academic communities and have received considerable attention. It serves as a concise, high-level summary of the paper's content, encapsulating the essence of the research and its findings [15]. This brief yet comprehensive overview not only provides a snapshot of the paper's content but also significantly influences the paper's acceptance by academic journals and conferences. The abstract, therefore, is not merely an introductory piece but a stand-alone discourse that provides a high-level indicator of the content and structure of a paper.

Though scholars (Tippett, 2004 [16]; Markel, 1987 [17]; Day, 1994 [18]; Brusaw, 1982 [19]) have reached no consensus regarding the definition of abstracts, they agree on several essential characteristics and significance of a well-written abstract. It is agreed that the prominent features of an abstract are concise, objective and coherent (Corson 1997: 671-718) [20]. An abstract needs to be concise because it should include the major contents with limited words. Objectivity is another feature of abstracts because of the formality and scientificity of academic writing. Besides, as a formal discourse, an abstract must be coherent.

The quality of an abstract directly affects the acceptance of the paper by academic journals and conferences. Editors and conference organizers often review abstracts to decide on the acceptance of a paper or the eligibility of participants, without referring to the full text. This underscores the pivotal role of the abstract in the academic publishing process.

## 2.3. Functions of Nominalization in Sci-Tech Articles

The objective of crafting scholarly articles is to propagate scientific understanding, archive research findings, or share wisdom and perspectives. Consequently, the language employed necessitates precision, logic, brevity, and validity. The abstract, serving as the encapsulation and distillation of the article's central theme, demands even greater clarity, logic, and brevity in its language to encapsulate the article and pique the interest of readers. The significance of nominalization in the abstracts of scientific and technical papers is primarily manifested in the following areas: 1) Enhancing the discourse's informativeness. Within such a limited space, it's crucial to lucidly convey the paper's concepts or primary components. Besides refining the language and pinpointing the text's key points, the author is also expected to employ a lexicon that is as informative as possible. Halliday (1985) took the process of nominalization as a package [21]. Nominalization, being a highly abstract and informative structure, can make the article's expression more succinct by condensing and bundling minor sentences, and can largely fulfill the demands of scientific and technical writing, particularly abstract writing. This is why nominalization is extensively used in numerous abstracts of scientific and technical papers. 2) Amplifying the discourse's objectivity and formality. To be persuasive, it's essential to maintain the paper's objectiv-

ity and formality. By obscuring, diluting, or eliminating the original action's participants in the discourse, the opinions or modes of behavior that initially relied on a specific time and the speaker's subjective will become universal. Wang Jinjun (2003) also proved in his study the positive relationship between the frequency of nominalization and the degree of formality of discourse type [22]. 3) Improving the articulation of discourse. Nominalization serves the movement from rheme to theme, which is a characteristic of academic writing as a chain of reasoning (Thompson, 2000) [23]. Specifically, there are a variety of links between the theme and the rheme in the discourse. The theme generally conveys known information, while the rheme conveys new information. The information from the previous sentence can be used as the theme of the next sentence in the form of nominalization, thus enhancing the articulation of the discourse and moving it forward. The main way to achieve the articulation function of nominalization in technological discourse is to use the noun of the previous sentence or a part of it as the theme of the next sentence.

## 2.4. Summary

The discourse in this section illustrates the significant strides made in the realm of nominalization and abstraction studies. However, a critical examination of prior work reveals certain inherent limitations.

For instance, previous research has primarily focused on verb nominalization and adjective nominalization. However, there exist other forms of nominalization, such as circumstance, relator, and zero nominalizations, as suggested by Halliday and Matthiessen (1999) [24]. Generally, these other forms are seldom discussed in the existing body of literature.

Building upon the rich findings of previous research and aiming to expand the existing studies, the objective of this study is to juxtapose the use of nominalization in Chinese-English and English abstracts of scientific and technical articles. The hope is that by analyzing the commonalities and disparities between Chinese-English and English abstracts in scientific and technical fields, we can provide valuable insights to Chinese scholars in crafting high-quality abstracts.

## 3. Methodology

This section delineates the research methodology. A thorough and meticulous discussion was deemed essential to ensure a holistic, integrated, and scientific research design.

### 3.1. Research Questions

This study seeks to explore the utilization of nominalization in English abstracts of scientific and technical articles penned by both Chinese academics and native English academics. The comparison will specifically focus on two main categories of nominalization. To fulfill this objective, the following queries will be addressed:

- 1) What are the interlingual differences at the lexical level of nominalization between the English and Chinese-English abstracts of sci-tech articles?
- 2) What are the interlingual differences at the clausal level of nominalization between the English and Chinese-English abstracts of sci-tech articles?

### 3.2. Corpus Building

The foundation and assurance of any research are the scientific research methodologies. This study utilized a corpus-based methodology to examine the features of nominalization in abstracts.

To conduct a reliable comparative study of nominalization in English abstracts, two corpora have been gathered in this research. Corpus OA consists of 100 random-selected English abstracts of sci-tech articles from Nature, which is a weekly international journal publishing the finest peer-reviewed research in all fields of science and technology on the basis of its originality, importance, interdisciplinary interest, timeliness, accessibility, elegance and surprising conclusions. Corpus TA consists of 100 random-selected Chinese-English abstracts of sci-tech articles from China Science papers, which is a national core Chinese journal sponsored by the Science and Technology Development Center of the Ministry of Education, mainly reporting the latest significant and innovative achievements in the fields of natural science, engineering and technology. The disciplines of research articles in these two corpora mainly include material science, mechanical engineering, computer science, biology. The choice of the disciplines under study was based on the fact that biology is a representative of natural sciences; mechanical engineering is one example of the engineering area and finally computer science, which is quite different from the others. The corpora were compiled, pre-processed, and automatically annotated for parts-of-speech and lemma-ta. Emphasis will be given to the analysis and comparison of the differences in the usage and frequency of nominalization in Chinese-English and native English abstracts of sci-tech articles. (**Table 1** and **Table 2**)

**Table 1.** Holistic descriptive statistics of the two corpora.

	Sum			Mean		
	words	clauses	sentences	words	clauses	sentences
TA	17725	2643	614	177.25	26.43	6.14
OA	22617	2395	823	226.17	23.95	8.23

**Table 2.** Average number of words of the 200 abstracts.

	TA	OA
Average number of words per abstract	177.25	226.17
Average number of words per sentence	28.867	27.461
Average number of words per clause	12.45	13.39

### 3.3. Theoretical Framework

The theoretical framework for the paper is M.A.K Halliday's Systemic Functional Grammar (SFG), which started in the 1960s and was updated in 1985, 1994 and 2004, and was further developed by several followers such as Thompson (1996) [25] and Martin *et al.* (1997) [26].

Building upon the foundational studies of normalization, nominalization is a linguistic principle that denotes the transformation of a verb, an adjective, or a clause into a noun or a nominal group. By amalgamating the perspectives of other researchers (Halliday, 1985 [21]; Quirk, 1985 [27]; Biber, 1988 [28], etc.), nominalization can be dissected by two criteria: morphology and syntax, or in other words, lexical and clausal.

To put it differently, nominalization is the grammatical mechanism that enables entities to appear as nouns and, for the scope of this research, can be further divided into two subsets: lexical and clausal nominalization. Lexical nominalization involves the nominalization of an individual word, such as verbs (e.g., develop becomes development) or adjectives (e.g., confident becomes confidence), indicating a class shift. Conversely, clausal nominalization is applicable at the phrase and clause levels, for example, "awaken the public conscience" becomes "awakening (of) the public conscience", denoting a rank shift.

**Table 3** provides a clear illustration of the relationships of nominalizations occurring at various organizational levels. This research will scrutinize both lexical and clausal nominalization in detail.

#### 1) Lexical nominalization

a) Suffix: The most common form of nominalization, a way of forming a noun structure by adding a suffix to an adjective or verb.

Example:

*To maintain performance, the filter units must inevitably be replaced at some point, which requires **maintenance**, involves costs and generates solid waste.* (No.5 in OA)

b) Conversion: a form of nominalization that does not necessitate a change in the word's form.

Example:

*The adverse **impact** of particulate air pollution on human health has prompted the development of purification systems that filter particulates out of air.* (No.14 in OA).

c) Cr-ing gerund: mainly refers to the nominalization of verbs.

Example:

**Table 3.** Relationships of nominalization.

Nominalization					
Lexical (class-shift)			Clausal (rank-shift)		
suffixation	conversion	ing-gerund	to-infinitive	Wh-clause	That-clause

*We anticipate that our purification approach will be useful for the development of specialist air purifiers that might prove useful in **settings** such as hospitals, factories and mines.* (No.14 in OA).

#### 2) Lexical nominalization

In addition to lexical nominalization, another type of nominalization occurs at the clause level.

##### a) To-infinitive clauses

Example:

*Positron binding to molecules is key to extremely enhanced positron annihilation and positron-based molecular spectroscopy.* (No.25 in OA).

##### b) Wh-clauses

Example:

*When deciding what to eat, animals evaluate sensory information about food quality alongside multiple ongoing internal states 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.* (No.88 in OA).

##### c) That-clauses

Example:

*We show that the multi-step conversion pathway between aluminium and chalcogen allows rapid charging at up to 200C, and the battery endures hundreds of cycles at very high charging rates without aluminium dendrite formation.* (No.18 in OA).

### 3.4. Research Instruments

This study harnessed the capabilities of AntConc (version 3.2.2), an advanced monolingual corpus retrieval tool, to locate and extract the five distinct types of nominalization present in the corpora. The functions of AntConc software can be used for word frequency retrieval, collocation retrieval, ranking of word frequency table, word cluster calculation, retrieval and positioning of monolingual corpus. In recent years, AntConc software has been gradually applied to text analysis of various languages, such as linguistics, pedagogy and pedagogy research.

Furthermore, we also utilized SPSS (version 11.0)—a highly recognized statistical software renowned for its utility in selecting statistical tests, generating descriptive statistics, and conducting and interpreting a range of basic statistical results. The production of basic statistics, encompassing elements such as sum, average, minimum, maximum, standard deviation, t-value, p-value was instrumental in our analysis. Resulting data were neatly displayed in tables or diagrams, each accompanied by a detailed description and interpretation, supplemented by examples extracted from the two corpora.

### 3.5. Procedures of Data Identification and Analysis

The complete data handling process, from collection and identification to classification, processing, and analysis, considerably impacts the study's validity, re-



liability, and objectivity. Thus, meticulous planning is critical for every step of the research procedure.

## 4. Results and Discussion

In this section, we will provide a comprehensive and detailed comparison and analysis of the two speaker groups. Given the different sizes of the two corpora, the nominalization frequencies extracted from them cannot be directly compared. Therefore, the nominalization frequencies in this study are presented as percentages.

### 4.1. Overview of the Use of Nominalization

All instances of nominalization at both the lexical and clausal levels have been con-corded and computed. **Table 4** displays the frequency and percentages of nominalization usage by TA and OA.

**Table 4** reveals the overall frequency of nominalizations in the two corpora. At a glance, it is evident that TA uses significantly more nominalizations per abstract on average. Slightly more conversion and -ing gerund in lexical nominalizations are used in TA than in OA, with the differences being 0.01% and 0.4% respectively. However, OA uses nominalization at the clausal level far more frequently, accounting for a larger percentage of total clause usage. The differences are 1.34%, 3.11%, and 7.4% for To-infinitive, Wh-clause, and That-clause respectively. However, this description does not provide a precise explanation of the situation. We will employ the Independent Sample T-test to determine if there is a significant difference in nominalization usage and frequency between the two corpora. The ensuing discussions will provide a comprehensive and detailed comparison of the two corpora.

### 4.2. Comparison of Nominalization

#### Holistic Comparisons between TA and OA

##### 1) Lexical Nominalization

As per **Table 5**, it is evident that the percentage of suffixational nominalization in TA is higher (2.38%) than in OA. Furthermore, a statistical difference ( $p = 0.000$ ,  $p < 0.05$ ) in the usage of suffixational nominalizations is apparent. The data suggests the possibility of Chinese writers overusing suffixations.

**Table 5** reveals a minor discrepancy (0.01%) in the employment of conversational nominalizations between the two groups, with native authors utilizing fewer conversions compared to their Chinese counterparts. However, the independent sample T-test outcome suggests no statistical variance ( $p = 1.000$ ,  $p > 0.05$ ) in this particular usage.

Referring to **Table 5**, it becomes evident that Chinese authors employ 0.40% more -ing gerunds in their abstracts than native authors. A significant difference is observed ( $p = 0.006$ ,  $p < 0.05$ ), indicating a propensity among Chinese authors to overuse -ing gerunds.

**Table 4.** Holistic frequency of nominalizations used by TA and OA.

		TA		OA	
		Number	Percentage	Number	Percentage
Lexical	Suffixation	1598	9.02%	1502	6.64%
	Conversion	108	0.61%	136	0.6%
	-ing gerund	228	1.28%	198	0.88%
	subtotal	1934	10.91%	1836	8.12%
Clausal	To-infinitive	129	4.88%	149	6.22%
	Wh-clause	61	2.31%	130	5.42%
	That-clause	120	4.54%	286	11.94%
	Clausal (subtotal)	310	11.72%	565	23.59%
Total		1878		2401	
Mean		18.78		24.01	

**Table 5.** Frequency and independent sample t-test of lexical nominalization.

Items	TA		OA		P
	number	percentage	number	percentage	
Suffixation	1598	9.02%	1502	6.64%	0.000 < 0.05
Conversion	108	0.61%	136	0.6%	1.000 > 0.05
-ing gerund	228	1.28%	198	0.88%	0.006 < 0.05
Subtotal	1934	10.91%	1836	8.12%	0.000 < 0.05

Drawing from the outcomes of the three subtypes above, a significant difference ( $p = 0.000$ ,  $p < 0.05$ ) is apparent in their overall usage of lexical nominalizations.

To facilitate a comprehensive understanding, suffixational nominalization can be further categorized into subtypes. **Table 6** displays the suffixes most commonly used in the two groups. At a glance, it is evident that: 1) in OA and TA, aside from the suffixes of -ment, -er/or, and -ty, the usage sequences of suffixes are almost identical. -ion is the most frequently used, while -ency is the least used. 2) There are significant disparities in the frequency of suffix usage in the two groups. The usage frequency of -ion in both TA and OA far exceeds that of other suffixes.

## 2) Clausal Nominalization

**Table 7** reveals a higher percentage of suffixational nominalization in TA (1.34%) compared to OA. Furthermore, a significant statistical discrepancy ( $p = 0.000$ ,  $p < 0.05$ ) is evident in the usage of to-infinitive, suggesting a potential overuse by Chinese authors.

Regarding the wh-clause, native writers demonstrate a considerably higher usage rate (2.54%) of wh-clausal nominalizations than their Chinese counterparts. The table above confirms a significant difference ( $p = 0.000$ ,  $p < 0.05$ ), implying

**Table 6.** Frequency and independent sample t-test of lexical nominalization.

Items	TA		OA		P
	number	percentage	number	percentage	
Suffixation	1598	9.02%	1502	6.64%	0.000 < 0.05
Conversion	108	0.61%	136	0.6%	1.000 > 0.05
-ing gerund	228	1.28%	198	0.88%	0.006 < 0.05
Subtotal	1934	10.91%	1836	8.12%	0.000 < 0.05

**Table 7.** Frequency and independent sample t-test of clausal nominalization.

Items	TA		OA		P
	number	percentage	number	percentage	
To-infinitive	129	4.88%	149	6.22%	0.000 < 0.05
Wh-clause	76	2.88%	130	5.42%	0.000 < 0.05
That-clause	150	5.68%	286	11.94%	0.000 < 0.05
Subtotal	355	13.43%	565	23.59%	0.000 < 0.05

a possible underutilization of this type of nominalization by Chinese English learners.

Referring back to **Table 7**, a significant discrepancy ( $p = 0.000$ ,  $p < 0.05$ ) in the usage of that-clauses between native and Chinese writers is apparent. A 6.26% difference further underscores this substantial disparity.

Considering the overall usage of nominalizations at the clausal level, the t-test results displayed in the table above reaffirm a significant difference ( $p = 0.000$ ,  $p < 0.05$ ) between the two corpora in the usage of clausal nominalizations.

### 4.3. Discussion

This section presents the research results according to the research questions presented in Chapter III. When conducting comparative studies, the results showed that the comparison method between TA and OA could be used to compare similarities and differences.

The study at hand delves into the proficiency of Chinese scholars in using lexical and clausal nominalizations in English abstracts of scientific and technical articles, as compared to their native English counterparts. The findings suggest that Chinese scholars are not as adept in this area, a deficiency that is attributed to a lack of awareness and skill in using different forms of English expression, particularly nominalization. This deficiency is speculated to be influenced by their first language, Chinese, which operates on different grammatical structures and principles. The study provides a plethora of examples to substantiate this claim. One such example is the overuse and repetition of certain nominal forms by Chinese writers. The phrase “the development of...” is found to recur 7 times in a single abstract (No.26 of TA) and 13 times in another one (No.47 of TA),

and “the impact of” occurs 8 times in one abstract (No.19 of TA) and 11 times in another (No.67 of TA), indicating a lack of variety in their use of nominalizations. In stark contrast, native English writers demonstrated a wide array of nominalizations in their writing, showcasing their proficiency in this area. For example, one abstract (No.58 of OA) involves all three kinds of nominalization, which uses different forms of suffixation 15 times, conversion 8 times, and -ing 6 times. The study further substantiates its findings with key statistical data. It was found that there are significant statistical differences in the use of lexical and clausal nominalizations between texts written by Chinese scholars (TA) and native English scholars (OA), with p-values of 0.000 ( $p < 0.05$ ) in both cases. This data strongly suggests that Chinese writers struggle with realizing ideational metaphors through constructing nominal forms, possibly due to a lack of understanding of grammatical metaphors.

Moreover, the study found that Chinese writers tend to overuse certain nominal forms and repeat the same words, while native English writers use a variety of nominalizations. This lack of variety in their writing could be a result of their struggle with clausal nominalizations, which may explain why their abstracts tend to be longer. The influence of the Chinese language, which has different grammatical structures and principles, may negatively affect Chinese scholars' use of English nominalizations. These disparities indicate a lack of proficiency among Chinese writers in utilizing clausal nominalizations to articulate their thoughts and enhance overall clarity. These significant disparities, to a degree, elucidate why Chinese writers tend to produce lengthier abstracts. However, Lust & Chien (1984) posited that Chinese is a head-initial language, contrasting with English's head-final structure [29]. Jin Jiling (1998) holds the view that the Chinese adhere to a front-weight principle, whereas English abides by an end-weight principle [30]. Cai Huiping (1999) further asserted that the arrangement of structures in Chinese and English exhibits differences [31]. Moreover, influenced negatively by their native language, a majority of Chinese scholars, according to Halliday's theory, struggle with metaphorical thinking and lack proficiency in employing complex English structures, particularly in the context of clausal-level nominalizations.

For example, there is a sentence saying that:

*The research results show that when the output is constant, the lower part of the tubing should be appropriately selected as a combination tubing with a large inner diameter and a thinner wall.* (No.8 of TA).

However, there's no need to use such a Wh-clause. Instead, it can be easily changed into:

*The research results show that under conditions of constant output, the lower part of the tubing should be appropriately selected as a combination tubing with a large inner diameter and a thinner wall.*

Besides, the same types of that-clauses are always overused. For instance, in No.14 of TA, the clause “...showed that...” and “...indicated that...” occurred 5

times in all. The lack of proficiency in using nominalizations may hinder Chinese scholars from producing high-quality abstracts similar to their foreign counterparts. This study, therefore, underscores the need for Chinese scholars to improve their proficiency in using nominalizations in English, to ensure the quality of their scientific and technical articles is on par with their native English counterparts.

There exist great significant differences in the general use of nominalization in the English abstracts of sci-tech articles between Chinese scholars and native English scholars. All these differences suggest that Chinese scholars may have limited awareness of nominalization and may not possess the proficiency to employ different forms of English expression effectively.

## 5. Conclusions

The thesis presents an in-depth analysis of the use of nominalization in English abstracts of scientific and technical articles, comparing the writing styles of Chinese scholars and native English scholars. The primary focus is on the differences in the application of lexical and clausal nominalizations between the two groups. The study employs a corpus-based approach, utilizing self-built corpora for the analysis. In conclusion, the thesis provides valuable insights into the use of nominalization in English academic writing among Chinese scholars. However, it also highlights the need for further research to fully understand the nuances of this aspect of academic writing.

Utilizing self-compiled corpora, this research delves into the query of whether substantial disparities exist in the application of nominalization in English abstracts of scientific and technical articles penned by Nature and China Science paper. The conclusions drawn from the analysis in the chapter- results and discussion are as follows:

First, the study reveals significant disparities in the use of nominalization between Chinese and native English scholars. It is found that Chinese scholars tend to overuse lexical nominalizations, a trend not observed among native English scholars. Furthermore, Chinese scholars demonstrate less proficiency in the application of clausal nominalizations compared to their native English counterparts. These findings suggest that Chinese learners may need to invest more effort in mastering this aspect of English academic writing.

Second, the study also provides examples of different types of nominalization, including suffixational nominalization and -ing gerunds. These examples serve to illustrate the differences in usage patterns between the two groups of writers.

The observation of a significant disparity in the overall usage of lexical and clausal nominalizations between the two corpora suggests an overuse of lexical nominalizations by Chinese authors, who, however, do not employ clausal nominalizations as adeptly as native speakers to articulate their thoughts and enhance their writings. The variance in the usage of nominalizations between the two sets of authors indicates that Chinese learners still have a considerable journey ahead.

Based on the research findings, there are several suggestions for Chinese authors to improve their writing:

**Increase variety in nominalizations:** Chinese writers should strive to use a wider range of nominal forms and avoid repeating the same words. This can enhance the richness and diversity of their writing.

**Improve proficiency in clausal nominalizations:** Chinese authors should focus on developing their skills in using clausal nominalizations to articulate their thoughts more effectively and improve overall clarity.

**Overcome the influence of the Chinese language:** Chinese scholars should be aware of disparities in grammatical structures and principles between Chinese and English and work towards overcoming them to produce high-quality abstracts.

**Enhance metaphorical thinking:** Chinese scholars should strengthen theoretical learning of metaphorical thinking, which is important for them to develop proficiency in employing complex English structures, particularly in the context of clausal-level nominalizations.

By following these suggestions, Chinese authors can improve their proficiency in using nominalizations in English and ensure that the quality of their scientific and technical articles matches that of their native English counterparts.

Despite its insightful findings, the study acknowledges several limitations. The sample size used for the analysis is relatively small, which may affect the generalizability of the results. Additionally, the study does not include a disciplinary comparison in the use of nominalization. This omission could potentially limit the scope of the findings, as the use of nominalization might vary across different academic disciplines. In light of the limitations, the authors propose several recommendations for future research. They suggest the use of more diversified texts for analysis to ensure the representativeness of the abstracts. This could involve including abstracts from a wider range of disciplines. The authors also recognize the need for more time, energy, and a solid knowledge background to produce reliable results. This acknowledgment underscores the complexity of the subject matter and the meticulousness required in conducting such studies.

## Conflicts of Interest

The authors declare no conflicts of interest.

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