

A Comparative Study of Thematic Progression in Abstracts of Scientific Papers -- A case study of Science and Science Bulletin

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Abstract

Abstracts play an important role both in paper submission and in attracting readers' interests for scientific papers. The quality of an abstract directly affects the evaluation of a paper. In this article, Science and Science Bulletin, two comprehensive journals published respectively in American and China, are chosen to conduct a comparative study of the differences of abstracts written by Chinese and foreign authors. From each of these two journals, 30 article abstracts are collected randomly to build our own corpus. From the perspective of Thematic Progression, using quantitative study method, we compare the characteristics of the abstracts in these two journals and try to provide some useful statistics and reference for Chinese authors inscientific paper writing.

Key words: abstract, scientific paper, Theme Progression, Science, Science Bulletin

1. Introduction

Abstracts of scientific papers, as a special genre, have its own characteristics in terms of grammar, vocabulary and organization. The abstracts of high-quality scientific papers are to be precise, concise, grammatical, formal, and logical (American National Standard Institute, 1979). A well-organized, concise abstract with clear logic, is of great significance to both the authors and the readers of scientific papers.

In this article, two typical comprehensive journals are selected to conduct the study: *Science* and *Science Bulletin*. *Science* is one of the top journals worldwide and *Science Bulletin* is one of China's top scientific journals. With the Impact Factor of 34.6 (in 2017), *Science* not only represents advanced scientific results in content but also rigorous, logical and fluent language expression and organization. The study of abstracts in *Science* helps us to discover the language organization characteristics of scientific paper abstracts. *Science Bulletin* is journal in English with papers submitted by Chinese authors, and thus the abstracts in this journal have its own distinctive features. Therefore, a comparative analysis of the language organization of the two journals could improve our understanding of the differences in organization of information in abstracts between foreign authors and Chinese authors.

Theme and Thematic Progression can reflect the organizational structure and information development of the article, as well as the author's manner of thinking. The concept of Thematic Progression has attracted the attention of scholars in China and abroad since it came out. Chinese linguists of the systemic-functional grammar such as Hu Zhuanglin, Huang Guowen and Huang Yan have put forward their own opinions. Many scholars in China have also conducted a series of research on different genres applying the Thematic Progression, and a lot of accomplishment has been achieved. However, little comparative study was found in these researches.

This paper analyzes the similarities and differences of Chinese and foreign authors' scientific paper abstracts from the perspective of Thematic Progression, with the purpose of providing useful reference for Chinese scientific paper authors.

2. Theme and Thematic Progression

The word "Theme" was first proposed by the Czech linguist, the founder of the Prague School, Matthews. In 1960s, Halliday further elaborated on Theme and Rheme. He points out that the Theme is the element which serves as the point of departure of the message and it is that with which the clause is concerned (Halliday,1985). Rheme is the information in the sentence other than the Theme, it is the target of the discourse, and it discusses the Theme. Within the sentence structure, the Rheme is always after the Theme.

According to the composition of the Theme, Halliday divides Theme into three types: Simple Theme, Multiple Theme and Clausal Theme. Halliday holds the point that Simple Theme can be a noun phrase, an adverbial group or a prepositional phrase (Halliday,1994). To be more

scholars for a long period of time. In terms of the pattern of Thematic Progression, Danes pointed out that there were five main patterns, namely, Simple Linear, Continuous Theme, Derived Theme, Split Rheme and Split Theme (Danes, 1974). Chinese scholars hold various viewpoints about the patterns of Thematic Progression. Hu Zhuanglin puts forward three Thematic Progression patterns (胡壮麟等, 2008). Huang Guowen sums up six patterns (黄国文, 1988). Huang Yan believes that there are seven main patterns (黄衍, 1985). Xu Shenghuan proposed four Thematic Progression patterns (徐盛桓, 1982). Recently, Zhu Yongsheng concluded four Thematic Progression patterns based on his analysis (朱永生, 1995). It's noticed that although the scholars' ideas of the Thematic Progression patterns are not fully consistent with each other, there is no fundamental conflict in these ideas.

In this paper, Zhu Yongsheng's four Thematic Progression patterns were adopted to analyze 60 abstracts of scientific papers in our self-built corpus. The four patterns applied are: Parallel, Concentration, Continuity and Intersection (朱永生, 1995). Parallel means that the Themes of all the clauses are the same while the Rhemes are different. The Theme of the first clause is taken as the Theme of the rest clauses. It can be expressed as: $T_1 - R_1, T_2 (= T_1) - R_2, T_n (= T_1) - R_n$. Concentration indicates that all the Rhemes come from the Rheme of the first clause, either the same with the first Rheme or part of it, it's demonstrated as: $T_1 - R_1, T_2 - R_2 (= R_1), T_n - R_n (= R_1)$. The Continuity indicates that the Rheme or part of the Rheme of previous clause becomes the Theme of the following clause, expressed as: $T_1 - R_1, T_2 (= R_1) - R_2, T_n (= R_{n-1}) - R_n$. Intersection means that the previous Theme and the next Rheme are the same. It's concluded as $T_1 - R_1, T_2 - R_2 (= T_1), T_n - R_n (= T_{n-1})$. Numerous texts show that all these patterns are applied in a mixed way in one text. And it's rare that the text utilizes only one of the patterns.

3. Analysis and Discussion

This paper aims to compare the abstracts written by foreign authors in Science and those written by Chinese authors in Science Bulletin to discover the similarities and differences and thus to provide reference to improve the abstract writing for Chinese authors. According to the core collection of Web of Science, in 2015, there are 761 articles in Science and 182 articles in Science Bulletin. In order to make the conclusions of this study reliable, this paper randomly selected 30 abstracts from Science and Science Bulletin respectively. Then, a total of 60 selected abstracts were labeled and analyzed one by one.

Table 1 below shows the distribution of Simple Theme, Multiple Theme and Clausal Theme in the 60 abstracts.

	Simple Theme	Multiple Theme	Clausal Theme	Total
Science	147(86.0%)	20(11.7%)	4(2.3%)	171
Science Bulletin	174(78.0%)	39(17.5%)	10(4.5%)	223

Table 1: Distribution of different Themes

The statistics indicate that in the abstracts of both journals, the Simple Theme plays a dominant role, accounting for about 80% of the total. For example, *Theoretical studies (T) predict that two-dimensional (2D) boron sheets will adopt an atomic configuration similar to that of boron atomic clusters (R)*. While Multiple Theme comes to the second place (11.7% and 17.5% respectively), and in most cases the Multiple Theme consists of a textual element plus an ideational element, such as: *Here, we (T) visualize how retroviruses disseminate in secondary lymphoid tissues of living mice (R)*. Through the labeling, it's found that the Themes of abstracts in Science are usually composed of textual element "here" plus an ideational element "we". Furthermore, it's noticed that the Clausal Theme is used less frequently.

Comparing abstracts in Science with these in Science Bulletin, we found that in Science, the Simple Theme accounts for a higher percentage, reaching 86%. It can be seen that the Simple Theme is more likely to satisfy the requirements of scientific paper abstracts to be concise and direct. In Science Bulletin, there exist a higher proportion of Multiple Theme. It's also noticed that Chinese authors use the conjunctions (such as *whatever, what's more*) more often, trying to strengthen the textual cohesion and coherence.

	Unmarked Theme	Marked Theme	Total
Science	148(86.5%)	23(13.5%)	171
Science Bulletin	175(78.5%)	48(21.5%)	223

Table 2: Markedness of Theme

From the point of markedness, the use of Unmarked Theme is predominant in both journals, and the use of the ideational element *we*, as the Theme of the whole sentence, is applied more frequently. In Science, on average *weis* used one time in each abstract. For example, *We (T) present a power-efficient skin-inspired mechanoreceptor with a flexible organic transistor circuit that transduces pressure into digital frequency signals directly (R)*. The Unmarked Theme in Science accounts for 86.5% of the total, and the percentage of Unmarked Theme in Science Bulletin is 78.5%. The Unmarked Theme helps the readers to grasp the main information in a short time, and in this way, the authors' intention can be conveyed more effectively.

	Parallel	Concentration	Continuity	Intersection	Total
Science	60(35.1%)	28(16.4%)	65(38.0%)	18(10.5%)	171
Science Bulletin	67(30.0%)	61(27.4%)	71(31.8%)	24(10.8%)	223

Table 3: Thematic Progression Pattern

As we can see from Table 3, among the two journals, the Continuity is the most used TP pattern, accounting for 38% in Science and 31% in Science Bulletin. It's followed by the Parallel. The Continuity pattern plays an important role for the fluent expression and the close connection of information. It also helps to achieve coherence between existing information and new information, avoiding repetition, and demonstrating clear logic. The use of the Parallel pattern helps to explain a certain problem from a comprehensive perspective. Comparing Science with Science Bulletin, we found that the proportion of usage of Continuity pattern is higher in Science, and the proportion of Concentration and Intersection is lower than it is in Science Bulletin.

During data collection, it's observed that each abstract is combined with a variety of TP patterns in addition to the main pattern, thus maintains diversity while the text is fluent and concise. It's in consistent with the general features of scientific paper abstracts of logic and concision, but also, the various patterns attract readers' attention in terms of content and form.

4. Conclusion

In this article, we build a small corpus to compare and analyze the TP pattern of abstracts in two journals, Science and Science Bulletin. As scientific papers, there are many similarities between the journals in perspective of Theme and TP pattern, which follows the general writing features of scientific papers. It's inferred that both Chinese and foreign authors follow the basic rules of abstracts writing inscientific papers. At the same time, there is slight difference between the two in Theme and TP pattern. In Science, the Simple Theme and Unmarked Theme are more frequently applied. In addition, Continuity TP pattern in Science is more used.

The statistics and analysis of this study could help to enhance the understanding of the distribution and organization of information in abstracts of scientific papers, and have positive influence for the writing of abstracts and even the writing of the whole paper. For the readers, the understanding of the TP pattern can help them quickly understand the main information that the authors deliver, reducing the reading difficulty, and improving reading efficiency.

Of course, this paper only selects 60 abstracts as corpus, and makes a preliminary analysis of the TP pattern, revealing one aspect of the abstracts writing of scientific papers. More aspects of the abstracts writing are also worth studying to fully understand the features, and to further improve the quality of abstracts writing of scientific papers.

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