RESEARCH ARTICLE

A Study of Functional Equivalence Theory in the Chinese Translation of *Sapiens*：*A Brief History of Humankind*

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ABSTRACT

The translation of popular science works plays an extremely important role in cross-cultural communication. Taking Yuval Noah Harari's Sapiens as the research object, this paper analyses the Chinese translation of *Sapiens: A Brief History of Mankind* in four aspects: lexical equivalence, syntactic equivalence, contextual equivalence and stylistic equivalence, guided by Eugene A. Nida's functional equivalence theory. This paper gives corresponding translation methods on how to achieve functional equivalence in these four aspects, such as literal translation, free translation, rewriting, addition etc., in order to realize the dissemination of popular science information among different cultures.

Keywords: functional equivalence; popular science translation; *Sapiens*

1. Introduction

With the increasing role of popular science books in scientific, technological and cultural exchanges, it is more and more important to accurately translate and convey the information in the original text of popular science books. *Sapiens*, an Israeli super bestseller, is the famous work of Yuval Noah Harari, a young Israeli historian and winner of the 10th Wenjin Book Awards. In less than 500 pages, the book runs from 100,000 years ago to the 21st century, providing a philosophical global perspective for us to make sense of human development. The book was published in Hebrew in 2012 and was soon translated into nearly 30 languages. The brief history of humankind course adapted from the book has quickly been popular around the world，becoming the most popular course at the Hebrew University, Coursera and Mooc, attracting not only the attention of academics around the globe, but also the widespread interest of the public. The translator of the Chinese version of the book is Professor Lin Junhong of the Institute of Translation Studies at National Taiwan Normal University. And the English version of *Sapiens*, which is the reference for the Chinese version of the book, was created by Yuval Noah Harari especially for Chinese readers. Nevertheless, due to the differences in cultural backgrounds and the lack of relevant scientific expertise, it is still difficult for the general public in China to fully understand the contents of the work. Therefore, the author compared the Chinese version with the original English version, and found that the Chinese translation differs from the original in lexical, syntactic, contextual

and stylistic aspects, and is not just a literal translation for the whole text. In order to give domestic readers a more comprehensive understanding of human development and outlook, the author, based on the functional equivalence theory, explores how the translator achieved the meaning and cultural connotation that Yuval Noah Harari wanted to convey, so this research is very meaningful.

2.   Literature Review

As to popular science translation, many domestic scholars successively put forward their ideas about this. Yu Mingxue (1986) proposed that faithfulness, expressiveness, and elegance are required in the translation of popular science text. Later, Guo Jianzhong (2004) first concluded four characteristics that the translated popular science texts should have: being scientific, literary, popular and interesting. Based on the research of many popular science theorists, Guo Jianzhong has come up with three criteria for popular science translation, taking into account the four main characteristics of popular science text, namely, scientificity, literariness, interestingness, and popularity. Firstly, faithfulness to the original meaning, that is to say, conveying knowledge accurately, which corresponds to scientificity; secondly, written naturally and expressed clearly, that is to say, the translation should be literary, which corresponds to literariness; thirdly, easy to understand, that is to say, the wordings and phrases should be in line with the custom, which corresponds to interestingness, and popularity. In addition, Hou Ying and Huang Zhonglian (2014) focus on the problem of literary reproduction involved in scientific translation, suggesting that translators should reproduce the literary nature of the original text when translating popular science texts, and sometimes can make full use of the literary expressions of the target language to enhance the literary color of the text according to the needs of the readers, thus improving the quality and readability of the translated text.

When it comes to such researches by foreign scholars, the translator found that foreign scholars think the translator should meet readers' reading expectation. Khadidja Merakchi and Margaret Roger (2013) studied the translation of cultural metaphors in the genre of popular science articles using the Arabic translation of Scientific American as an example and based on a corpus. They finally adopted a series of translation strategies to meet readers' reading expectations. Therefore, popular science translation cannot be regarded as simply different language versions of the same material. Scientific texts are often treated as neutral and objective, and their translators are assumed to be invisible. On the contrary, Liao M. H. (2011) argues that the translator's role in the process of communicating popular science is worthy of investigation. He believes that the social responsibility assumed by translators and expected of them by society may explain their active participation in the process of interaction with target readers. When analyzing the translation methods of terms in popular science TV shows, Hrytsai, I. S. (2015) argues that terms in non-technical context can not only perform their direct nominative function, but also they can perform a stylistic function enriching the speaker's speech, hence making it more interesting for the audience. On this point, scholars at home and abroad reached a consensus. Generally speaking, domestic and foreign scholars hold the same view on popular science translation. Considering the fact that the practice of popular science translation has not been given enough attention, as well as the fact that there is a great lack of research on popular science translation, the author will conduct a study on Chinese translation of popular science texts in this paper, expecting that it can play a certain complementary role to the relevant research.

3.   Functional Equivalence Theory

Eugene A. Nida, an American linguist, translator, and translation theorist, developed functional equivalence theory in the process of translating the Bible. In 1964, Nida first proposed the term of "dynamic equivalence" in his article. Later, Nida (1969) pointed out that "Translation consists in reproducing in the receptor language the closest natural equivalent of the source language, first in terms of meaning and secondly in terms of style " in an article co-authored with C.R.Taber. There is a controversy that content equivalence precedes form equivalence. Thus, Nida and Jan De Waard proposed the term of "functional equivalence" to replace the term of "dynamic equivalence". This formulation is more scientific and refined than the previous one, but the common point is "equivalence".

In this theory, Nida pointed out that "Translation consists in reproducing in the receptor language the closest natural equivalent of the source language, first in terms of meaning and secondly in terms of style. " (Guo, 2000). The equivalence he means is "the most appropriate and natural" equivalence, rather than a copy. Translation conveys both superficial lexical information and deep cultural information. And functional equivalence includes four aspects: 1) lexical equivalence; 2) syntactic equivalence; 3) contextual equivalence; 4) stylistic equivalence. In addition, Nida believes that form is likely to hide the cultural meaning of the source language and hinder cultural communication, so he believes that meaning is the most important, and form is the second. However, it does not mean that only the meaning is taken into account without regard to the form, but that while the content information is equivalent, the form is also equivalent as far as possible. If the two cannot be satisfied at the same time, meaning equivalence is given priority. According to Nida's theory, the translator should take the four aspects of functional equivalence as the principle of translation to accurately reproduce the cultural connotation of the source language in the target language.

The purpose of functional equivalence is: "to seek the most natural approximation of equivalence between the target language and the source language. Nida proposes four basic requirements for achieving functional equivalence: 1) to have meaning; 2) to convey the spirit and behavior of the source language; 3) to express naturally and easily; 4) to produce similar responses. That is, functional equivalence requires the translator to translate the information in the source language in such a way that the target language readers can produce the same responses and have the closest possible understanding as the source language readers.

Considering the main purpose of popular science translation is to convey scientific knowledge and make readers understand, the translated text should reproduce the original meaning of the source text with natural expression, so that the target language readers can have a similar reading experience as the source language readers, which, to some extent, holds the same view as Nida's functional equivalence theory. Therefore, it is suitable here to use functional equivalence theory to analyze this translation study.

4. Case Analysis

Since there are many differences between the source language and the target language in terms of sentence structure, the active/passive voice, narrative order, etc., it is difficult for the author to reproduce the source text in the target language without related knowledge and appropriate translation methods. The case study is divided into the following four parts, and the author will find suitable methods to deal with these problems and provide some references for related translation in the future.

4.1. Lexical Equivalence

English words have multiple meanings, and the contextual meaning is the focus of semantic communication. Therefore, the translation should first ensure that the translation accurately conveys the context-specific meaning of the words in order to achieve lexical equivalence.

Example 1:

ST: A Spanish peasant to have..., to the din of Columbus' sailors boarding the Nina, Pinta and Santa Maria, the world would have seemed to him quite familiar.

TT: 假如有个西班牙农民......虽然这时哥伦布的水手已经登上新大陆，但他看看四周的世界，还是会感到十分熟悉。

The difficulty in translating this sentence lies in how to translate the phrase "Nina, Pinta and Santa Maria" in the most appropriate way. If "Nina, Pinta and Santa Maria" is translated directly as "尼娜、平塔和圣玛丽亚", Chinese readers will feel confused. In fact, the story is about "Columbus Discovered New Continent ", as Columbus' journey needed some money, King Ferdinand and Queen Isabella of Spain helped him. They wanted Columbus to find gold and a new way to India. They gave him three ships: the Nina, the Pinta and the Santa Maria. Besides, an important manifestation of the popularity is not achieved through the superficiality of the text, but by using many examples from the history of science to illustrate the relevant scientific principles. The

names of the three ships was translated into "新大陆", which is consistent with the original meaning. This shows that the translation should not only pursue the complete equivalence of information, but also require the translator to have a certain knowledge of different professional fields.

Example 2:

ST: Despite many changes in technology, manners and political boundaries, this medieval Rip Van Winkle would have felt at home.

TT: 这时的科技、礼仪和国界都有许多不同，但这位做了个李伯大梦的中世纪农民仍然能有家的感觉。

The difficulty in translating this sentence lies in how to translate the phrase "this medieval Rip Van Winkle" in the most appropriate way. If "this medieval Rip Van Winkle" is translated directly as "这个中世纪的瑞普·凡·温克尔", it will be difficult to understand if you have not read the novel written by American writer Washington Irving. The protagonist of this novel is Rip Van Winkle, who goes hunting alone on the nearby mountain on the Hudson River to escape his nagging wife. He meets Captain Hudson and his partner who discovered the river back then, and after drinking their special wine, he falls asleep. When he woke up and went home from the mountain, he realized that a whole twenty years had passed, the world had changed and everything was very strange. The story of "李伯大梦" is more like the Chinese story "王质烂柯", although the translator did not translate it that way, it also adds some degree of interest. In the context, the translator use "这个做了李伯大梦的中世纪农民" to refer to the Spanish peasant mentioned above, which is consistent with the original meaning and achieves lexical equivalence.

Example 3：

ST: It's likely that more than a few readers squirmed in their chairs while reading the preceding paragraphs.

TT：很多读者读到上面这一节，可能都觉得如鲠在喉。

Example 4:

ST: The peasants paid for the burgeoning cooperation networks with their precious food surpluses, despairing when the tax collector wiped out an entire year of hard labour with a single stroke of his imperial pen.

TT：在这种新兴的合作网络里，农民交出他们辛苦工作得来的多余粮食，但帝国的收税官只要大笔一挥，就可能让他们一整年的辛劳都化为乌有。

In the above examples, "squirmed in chairs", "a single stroke of his imperial pen", "wiped out", etc. are all equivalent in the original text. This will help the reader to understand the information of the original text more accurately. For example, the word "squirmed in chairs" in the example sentence is transformed from the ordinary meaning of "在椅子上蠕动" to the meaning of "如鲠在喉"". In the example sentence "a single stroke of his imperial pen", the original translation can not be simply translated as "帝王的钢笔划了一道", which is not logical and misleading to the reader. And here it is translated as "大笔一挥". Also, the word "wiped out" in the example sentence would confuse the reader if it was translated as "消灭", so it was translated as "化为乌有". At the level of lexical equivalence, the word in the sentence should not be translated according to its ordinary meaning in the sentence, so as to avoid the phenomenon that the translation is very different from the original meaning. Therefore, the translation of word should be based on the speculation of its special meaning or extended meaning in order to achieve functional equivalence. In addition, literariness is an indispensable characteristic of popular science work, so the translation needs to have some grace as well. Chinese four-character idiom is a major feature of the Chinese language, which are not only concise, succinct and easy to understand and remember, but also neat and harmonious, with a sense of rhythm, which can make the expression more vivid and full of literary grace. The three Chinese four-character idioms "如鲠在喉", "大笔一挥" and "化为乌有" not only accurately convey the meaning of the original text, but also give the translation a

clearer picture of the hateful face of the imperial tax collectors and the helplessness and misery of the peasants. At the same time, it gives the translation a literary flavour and makes the expression more vivid.

4.2. Syntactic Equivalence

Scientific English, as a unique genre, has its own syntactic features, and popular science genre, as a branch of scientific English, retains its unique syntactic features: long sentences, complex structures, and most use of passive voice. Therefore, when translating science popularization, it is necessary to clarify the relationship between words and sentences through sentence analysis in order to accurately understand the content expressed by the linguistic form and successfully translate into the target language.

Example 5:

ST: By the time the bomb was ready, in early August 1945, Germany had already surrendered, but Japan was fighting on.

TT: 1945 年 8 月初，原子弹制造完成，虽然德国已经投降，但日本还在负隅顽抗。

Example 6:

ST: There is some evidence that the size of the average Sapiens brain has actually decreased since the age of foraging.

TT: 有证据显示，自从采集时代以来，智人的脑容量其实是逐渐减少。

In English, the temporal adverbial is usually placed posteriorly, that is, after the sentence, while Chinese, on the contrary, tends to advance the temporal adverbial. Therefore, the translator takes into account the language habits of the target language audience and puts the temporal adverbial of the original sentence in front of the sentence. The beginning of the sentence gives a time clue"1945年8月初""自从采集时代以来". The time line is smooth and natural, and the reader can easily understand it. The word "fighting on" in the example5 should be translated as "继续战斗", but the translator translated it as "负隅顽抗". The use of the four-word idiom inadvertently reflects the literariness of the popular science genre. Although the translation does not maintain formal equivalence with the original, it achieves equivalence in terms of meaning.

Example 7:

ST: Most buildings were constructed of mud, wood and straw; a three-storey building was a skyscraper.

TT: 多数建材使用泥土、木材和稻草；只要有三层楼的建筑，就已经算是座摩天大楼。

There are many sentences in passive form in popular science English texts, which have tight logic and complex structure. In this regard, the translator has to sort out and correctly understand the structure of the sentence to avoid mistranslation of the information. In the translation of the passive voice, example sentence, if translated as "大多数建筑物是由泥土、木头和稻草建造的", would appear to be rigid, not in line with the language habits of the target language readers, and it would appear to be unnatural and difficult for the readers of the translated text to understand. Therefore, the sentence should be translated in the active voice as "多数建材使用泥土、木材和稻草". Syntactic equivalence is thus achieved. The second part of the example uses the rhetorical device of hyperbole to convey the current state of architecture at the time, where a mere three-storey building was already considered high and luxurious. There is a sense of amazement that the previous society was backward. The use of hyperbole makes the translation vivid and interesting, giving people a sense of novelty and change, enriching the reader's imagination and reflecting the literariness of popular science works.

4.3. Contextual Equivalence

In order to achieve contextual equivalence, the author should figure out what the original author of the source text really wants to convey, and then show cohesion or coherence in the translated text by making the hidden logical relationship of the source text clear for target readers to understand.

Example 8:

ST: Having drawn it, Waldseemuller had to give it a name. Erroneously believing that Amerigo Vespucci had been the person who discovered it, Waldseemuller named the continent in his honour-America.

TT: 既然要画，瓦尔德泽米勒就得给它取个名字，但他误以为发现美洲的人是亚美利哥·韦斯普奇，因此为了向他致敬，这片大陆就被命名为"America"（美洲）。

Here, the logical relationship between these sentences is not very clear. In order to precisely reproduce the original meaning of the information in the source text to target readers in the target language, the translator, considering the context, used combination to combine the two sentences together with the addition of "但" at the beginning of the second sentence as a conjunction, because there is a adversative relationship hidden between the two sentences. In addition, the conjunction "因此" has been added to the second sentence. The preceding clause indicates the cause and the following clause indicates the consequence, containing a causal relationship. It also explains that the wrong name was taken later due to a misunderstanding earlier. So, the author use two conjunctions "但" and "因此" to link the translated clauses to keep the cohesion of the original sentence to achieve functional equivalence at the contextual level. In this way, it will be easy for target readers to understand the reason for the name "America". The target group of popular science works is mostly laymen in a certain discipline, so in order to maximize the communication purpose, it is very important to make it easy to understand. It can also be said that popularity is the life of popular science works. This example also demonstrates this point.

Example 9:

ST: Every few years, the planet Venus passes directly between the sun and the earth. The duration of the transit differs when seen from distant points on the earth's surface because of the tiny difference in the angle at which the observer sees it.

TT：每隔几年，金星就会从太阳和地球之间直接通过，形成看似金星从太阳表面划过的"金星凌日"现象。而根据从地球各处观看金星的角度有些微不同，能够观察到金星凌日的时间长短也有所不同。

In the source text, this part talks about Venus transit. The translator, as the bridge between target readers and the author of the source text, should try best to convey what the author really wants to convey in the target language according to the context. As the purpose of this paragraph is to explain Venus transit for readers, the author should precisely reproduce the original information in the target language as well as keeping the style of utterance to make readers understand the astronomical phenomenon. Here, if this example is literally translated, then the logical relationship between the two sentences will be hard to reproduce in the target language. The description of the phenomenon of "the planet Venus passes directly between the sun and the earth" is defined as "金星凌日", and then the "transit" that appears in the second sentence can be easily understood by the reader. So, to make the sentences connected tightly, the translator used addition and added "形成看似金星从太阳表面划过的'金星凌日'" to the translation to clearly show the logical relationship between the two sentences and make the translated sentences coherent and fluent for target readers to understand. In order to disseminate scientific and astronomical knowledge to the readers, the translator use literal translation to translate professional terminology, directly translating it as "金星凌日", which also reflects the scientificity of popular science translation.

4.4 Stylistic Equivalence

Differences in the linguistic style of the text mean that the cultural elements are different. Scientific and technological genres carry fewer cultural elements, so the accurate and truthful translation of the information content from the source language into the target language is far more important than the translation of the culture of the two languages. On the contrary, in literary genres, culture becomes one of the important factors to be considered in translation. If the cultural factor is ignored, the translation becomes a mere shell of words and sentences. The popular science genre is somewhere in between, keeping the scientific aspect and at the

same time not losing the literary aspect. Therefore, the translation should also maintain the stylistic characteristics of the language, so that Chinese readers can have the same feelings as those of the source language readers, in order to achieve stylistic equivalence.

Example10：

ST: Rather they are the only way large numbers of humans can cooperate effectively.

TT：...... 而是唯一能让大群人类合作的救命仙丹。

The popular science genre is a kind of scientific genre, focusing on the logical coherence of the narrative and the clarity and fluency of the expression, avoiding the obscurity, the expression of personal emotions by the author and the subjective arbitrariness of the argumentation. However, if the translator ignores the stylistic characteristics of popular science texts and overuses the accumulation of scientific facts to increase the scientificity of the articles, the readers will feel boring and difficult to get interested in reading further. In this example, the translator translates "the only way" as "救命仙丹", which is a metaphor, making the article more vivid and reflecting the literariness of popular science works. And the translation "救命仙丹" is a clever use of a literary expression that enhances the aesthetic effect of the translation. At the same time, it gives a mythological colour, because "仙丹" has a unique meaning in Chinese culture. From ancient times, there has been the legend of "不老仙丹", people have a very high expectation of this mysterious power, loved by the majority of readers. This also inadvertently adds interest to the article, so that readers are more willing to read on.

Example11：

ST: Bees don't need lawyers, because there is no danger that they might forget or violate the hive constitution. The queen does not cheat the cleaner bees of their food, and they never go on strike demanding higher wages.

TT：之所以蜜蜂不需要律师，是因为不会有蜜蜂打算违反什么蜂巢宪法，认为清洁蜂不该有生命权、自由权和追求幸福的权利。

This sentence uses the rhetorical device of personification, attaching the right of human beings to seek the right to life, liberty and the pursuit of happiness to bees, where it satirises the fact that ancient kings divided human beings into several classes, and the higher ones always try to deprive the lower ones of the right to life and liberty, which is why the Constitution and the lawyers have appeared. The translator translates "does not cheat the cleaner bees of their food, and they never go on strike demanding higher wages" as "清洁蜂不该有生命权、自由权和追求幸福的权利" , and chooses to nominalise the verb in the translation, which makes the things more vivid, gives the readers a deeper understanding of the things depicted by the author and makes the readers feel immersed, so as to enhance the readers' cognition and comprehension.

Example 12:

ST: Three important revolutions shaped the course of history: the Cognitive Revolution kick-started history about 70,000 years ago. The agricultural Revolution sped it up about 12,000 years ago. The Scientific Revolution, which got under way only 500 years ago, may well end history and start something completely different.

TT: 在历史的路上，有三大重要革命：大约7万年前，"认知革命"让历史正式启动。大约12000年前，"农业革命"让历史加速发展。而到了大约不过是500年前，"科学革命"可以说是让历史画下句点而另创新局。

There are a lot of long sentences in English, while short sentences are predominant in Chinese. Here, the translator advances the temporal clause in each of the three sentences, so that the logic is clear and the position of the three important revolutions in the historical process is clearly shown. At the same time, throughout the Chinese translation of *Sapiens*, the translator chooses to use rigorous language and declarative sentences when stating historical facts and relevant terminology, and objectively describes the four developmental processes of the cognitive revolution, the agricultural revolution, the unification of humankind, and the scientific revolution, without ornate decorations, and recreates for us the process of world history with the simplest and plainest

words. This not only preserves the lucid and crisp language style of the original text, but also conforms to the expression habits of Chinese.

5.   Conclusion

In conclusion, the research on the translation of popular science works based on functional equivalence theory is of great practical significance. In the aspect of lexical equivalence, the translation of vocabulary should start from its special meaning or extended meaning. In the aspect of syntactic equivalence, translator should use free translation to translate passive sentences and adopt the strategy of reorganization and rewriting to translate complex sentences. In the aspect of contextual equivalence, combination and addition can be used to translate the source text to keep the coherence of the text. In the aspect of stylistic equivalence, while using rigorous language and short sentences to maintain a crisp and lucid linguistic style, it is also necessary to combine the literariness with the use of rhetorical devices and Chinese idioms to increase the literary aesthetic effect and interest of the translated text, so as to achieve stylistic equivalence. This paper presents a case study of four aspects of functional equivalence and proposes translation strategies to achieve functional equivalence respectively, with a view to improving the quality and efficiency of popular science translation work and better realizing the wide dissemination of scientific knowledge.

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