

A Study on E-C Translation of BP Statistical Review of World Energy 2022 from the Perspective of Schema Theory

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Abstract

The global energy system is facing multiple challenges and uncertainties due to the impact of the Russia-Ukraine war and the COVID-19 pandemic. In order to achieve energy security and promote sustainable development, it is necessary to keep abreast of the latest information on global energy development. *BP Statistical Review of World Energy 2022* has been an important way to get the latest international energy information and obtain authoritative data since 1951. Therefore, the translation of this report can help the government and relevant practitioners to get the latest data on energy development and decide the future direction of energy development. The Schema Theory is employed to analyze the difficulties in translating such technology texts in energy field from three aspects: linguistic schema, content schema and formal schema in the research. As a result, the study shows that schema theory can help translators decode and recombine the original information with the schema they have mastered, making the translation conform to the cognitive schema of the target readers.

Keywords: E-C Translation, schema theory, energy and power English

1. Introduction

With the complex international environment currently and the rapid growth of energy consumption, grasping the current situation of energy development is the top priority of a country's development. In order to achieve energy security and sustainable development, it is necessary to keep abreast of the latest news of global energy development. *BP Statistical Review of World Energy 2022* has always been an important way to get the latest international

energy information and obtain authoritative data since 1951. This study uses schema theory to analyze the report from three aspects: linguistic schema, content schema and formal schema, in connection with the professional knowledge and terminology characteristics in the energy field. This study also analyzes the difficulties when translating such texts in the energy field.

2. Schema Theory and Translation Studies

2.1 Schema Theory

In 1781, Immanuel Kant, the classical philosopher in Germany, first proposed the theory of schema. Schema originated from the transcendental schema. (Tian Yun 1994; p. 326) In Kantian philosophy, a transcendental schema is the procedural rule by which a category or pure, non-empirical concept is associated with a sense impression. In 1932, British cognitive psychologist Bartlett defined schema in his book *Remembering: A Study in Experimental and Social Psychology*: as "... An active organization of past reactions, or of past experiences, which must always be supposed to be operating in any well-adapted organic response." (Barrett 1932; p. 201) This is the earliest definition of schema in modern psychological research. Since the 1970s, schema theory has been greatly developed and widely applied in linguistics, anthropology, psychology, artificial intelligence and other fields.

Scholars in different fields have defined schema theory from different perspectives. Minsky uses the term "frame" to describe the schema related to typical environments; (Minsky, 1975) Psychologist Jean Piaget regarded schema as a mediator from experience to concept, including the action structure and the thinking structure; Rumelhart, the AI expert, believes that schema is a group of "interacting" knowledge structures stored in long-term memory in hierarchical form. (Rumelhart, 1977) Although different scholars have different comprehensions of schema, they all believe that schema is an abstract and generalized knowledge and a cognitive structure existing in mind, which is significant.

2.2 Translation Based on Schema Theory

The research of schema theory has mainly focused on the reading and listening comprehension. However, in recent years, domestic scholars have begun to apply schema theory to translation studies from different perspectives such as linguistics and psychology. Some focus on language information, while others focus on text structure. For example, Liu Mingdong introduced "cultural schema", defined it as an organized knowledge structure block about culture in mind, and discussed several translatable ways of cultural schema through the characteristics of culture. (LIU Mingdong, 2003) Zhou Hongmin divided schema into linguistic schema and knowledge schema, the former acting on the understanding

of the text, and the latter acting on the expression stage. (ZHOU Hongmin, 2003)

Based on Rumelhart's schema theory, this paper analyzes and studies *BP Statistical Review of World Energy 2022* from three aspects: linguistic schema, content schema and formal schema. Linguistic schema refers to the translator's understanding of the original text, especially his cognition of its vocabulary and grammatical habits; content schema refers to the translator's mastery of the theme, background and content involved in the original text; formal schema refers to the translator's mastery of the original text genre and structure.

3. BP Statistical Review of World Energy 2022

Since its first publishment in 1952, *BP Statistical Review of World Energy 2022* has been providing objective and reliable data sources to help practitioners and governments understand the development of global energy. *BP Statistical Review of World Energy 2022* shows that this year, the global energy system is facing the biggest challenge and uncertainty in the past 50 years. The increasingly serious energy shortage and rising prices highlight the importance of energy security and "affordability" alongside low-carbon development in solving the energy dilemma. The report reviews the development and utilization of global energy in 2021 in the form of data and charts from ten perspectives, including energy development, fossil energy, renewable energy and low-carbon development.

Newmark divides all texts into three types: expressive text, informational text and vocative text. (Newmark, 1988) *BP Statistical Review of World Energy 2022*, as an informative text, is objective, accurate and logical with many professional terms. The main function of informational text is transmitting information. Therefore, it is sufficient for the translation of informative text to convey the meaning of the original text correctly, conform to the grammar of the target language, and be comprehensible and readable.

4. Study on BP Statistical Review of World Energy 2022 from the Perspective of Schema Theory

The following discusses the difficulties in scientific text translation caused by the differences between source language and target language from linguistic schema, content schema and formal schema.

4.1 Linguistic Schema

Understanding is the basis of translation and the first principle of schema theory. Therefore, the translation of scientific and technological documents requires translators to be proficient in English and understand professional knowledge. Due to the complexity of English for Science and Technology (EST), the translators should be good at determining the meaning of words through the professional context, word collocation, syntactic structure and the original text.

According to the characteristics of EST, its vocabulary can be generally divided into pure scientific and technological vocabulary, general scientific and technological vocabulary and new scientific and technological words. Pure scientific and technical terms refer to technical terms which are only applicable to a certain profession or discipline. As an energy text, *BP Statistical Review of World Energy 2022* uses a lot of professional words, such as naphtha (石脑油) and condensate production (凝析油产量). This kind of words have a narrow but stable meaning in a certain field. General technical words refer to those frequently used by different industries. The number of such words is large, and they are used frequently. Although they have different meanings in different industries, their meanings are often relatively stable. For example, the word “capacity” is generally understood as “容量, 能力” without any contextual constraints. However, in the power industry, it has the meaning of “电容, 负载量, 发电量”. The word “generation” usually means “代, 届”, while in the energy field, it is generally translated as “发电”. For instance, in *BP Statistical Review of World Energy 2022*, there are renewable power generation (可再生能源发电), hydroelectricity generation (水力发电), nuclear generation (核发电). Therefore, general technical words appear most frequently in EST and also have the most extensive application. (CAI Jigang, 2016) New scientific and technological words usually appear in the form of compounds, abbreviations, derivations, etc. For example, in *BP Statistical Review of World Energy 2022*, “LNG” is the abbreviation of Liquefied Natural Gas (液化天然气); “biofuel (生物燃料)” and “hydroelectricity (水电)” are compound words commonly used in the field of energy and electricity.

4.2 Content Schema

The application of content schema in EST

translation mainly includes the professional and cultural knowledge of the whole article. In the process of EST translation with the help of content schema, it is mainly to connect the content schema of the original text with the knowledge already in the translator’s mind, so as to translate the article. As an information text, *BP Statistical Review of World Energy 2022* should be accurate in “information level”. In other words, the presentation of the translation should achieve the unity of the same or similar schemata of the author and the target reader.

Example 1

ST: Encouragingly, renewable energy, led by wind and solar power, continued to grow strongly and now accounts for 13% of total power generation. Renewable generation increased by almost 17% in 2021 and accounted for over half of the increase in global power generation over the past two years.

TT: 好消息是以风能和太阳能为首的可再生能源增长势头强劲, 目前占总发电量的 13%。2021 年, 可再生能源发电量增长了近 17%, 占过去两年全球发电量增长的一半以上。

The translation of Example 1 focuses on how to translate pure scientific and technical terms and general scientific and technical terms, which determines whether the translation can correctly convey the connotation of the original text. Take the pure scientific and technical term, thermal equivalent efficiency factors (等效热系数) as an example. The translation of such term needs to be identified through verification and in combination with relevant professional knowledge to screen out the appropriate translation. For general scientific and technical terms, it is necessary to refer to the parallel text and correctly understand the sentence in combination with the basic knowledge of energy and electricity, so as to understand the exact meaning of the word in this sentence. For example, the word “power”, which appears many times in Example 1, how to translate it depends on the translator’s understanding of the sentence and basic knowledge in the energy field. Therefore, the words, “wind power” and “power generation” are translated as “风能” and “发电” respectively. In conclusion, the translator should not only master professional knowledge but also accumulate fixed phrases in certain areas in ordinary days in order to translate correctly and efficiently, connecting the original content with the schema in mind.

4.3 Formal Schema

Scientific articles are quite objective, which is reflected in their sentence structures such as using passive sentences, long and complex sentences, etc. (CHEN Kuang, 2018) Formal schema can help the translators to simplify the translation and make it more fluent and compact. The translator should find appropriate expressions for specific words or clauses on the basis of mastering the overall meaning of the text. The final expression cannot completely follow the form of the original text, because there are differences in the formal schema between the original and target text. The target text should ultimately tend to the formal schema of the target readers.

Example 2

TT: The increase in primary energy in 2021 was driven by emerging economies, which increased by 13 EJ, with China expanding by 10 EJ.

ST: 2021 年, 一次能源的增长是由新兴经济体推动的, 增长了 13EJ, 其中中国增长了 10EJ。

Example 2 is a typically long and complex sentence, so how to translate the non-restrictive clause guided by which is the key to the translation of this sentence. The word “which” refers to the phenomenon “the increase in primary energy was driven by emerging economies”. Besides, Chinese expression is not used to using pronouns and often omits subjects. As a result, in order to make the sentence structure more compact and the translation more concise, “which” is omitted here and the whole sentence is translated into a run-on sentence, which conforms to the reading habits of Chinese readers.

Besides, “primary energy” and “emerging economies” present a passive logical relationship, which is a very common expression in English. However, Chinese readers are more accustomed to the active voice. Therefore, if the translator directly follows the original logic and translates it as “一次能源的增长被新兴经济体驱动”, this expression appears very stiff and obviously does not conform to the Chinese expression habit. In this case, the translator can change the position of the subject and object of the original sentence, so that the voice of the sentence changes from the passive voice to the active voice. What is more, translators can also use other words to replace the word “被”. For example, in Example 2, the translator changes the word “被” to “由”, which not only achieves

the semantic consistency with the original text, but also meets the requirements of Chinese readers.

5. Conclusion

Under the guidance of schema theory, translators should first possess the schema of the source language, such as the ideas of the author, the characteristics of words, sentences and the whole text. Besides, it is necessary for translators to master professional knowledge and a complete schema of background in certain fields, in order to decode and recompile the schemata obtained from the original work, find the best equivalence from the target language, and completely as well as accurately reproduce the information in the original texts. In addition, translators should flexibly use the schema types they master and then select appropriate translation strategies.

Schema theory reveals an active role of existing cognition and experience in processing new information and provides guidance for translation. Based on schema theory, this paper discusses the difficulties in the translation of *BP Statistical Review of World Energy 2022*, puts forward requirements for the daily learning and accumulation of EST translators, and highlights the guiding role of schema theory. Translators should accumulate more professional knowledge in daily accumulation, actively establish connections in mind, decode and recombine the original information with the schema, and translate a translation that conforms to the cognitive schema of the target reader, so as to achieve effective communication, application and development of science and technology.

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