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Applicability of Koller's Equivalence Theory in the Chinese Translation of Popular Science Texts on Natural Medicines: A Case Study of Medical Toxicology of Natural Substances: Foods, Fungi, Medicinal Herbs, Plants, and Venomous Animals

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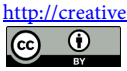

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Abstract

Within Western translation theory, equivalence theory has profoundly influenced translation practice. Grounded in Koller's framework of equivalence, this paper investigates the applicability of its five dimensions—denotative, connotative, text-normative, pragmatic, and formal equivalence—to the Chinese translation of popular science texts on natural medicines. Using the work *Medical Toxicology of Natural Substances*: *Foods*, *Fungi*, *Medicinal Herbs*, *Plants*, *and Venomous Animals* as a case study, the research aims to provide a theoretical reference for translation studies in related fields.

Keywords

Koller's Equivalence Theory, Natural Medicines, Popular Science Texts, Chinese Translation, Applicability

1. Introduction

As a key component of China's western region, Guangxi plays a crucial role in the national Western Development Strategy. In recent years, with the rapid expansion of the health industry, Guangxi has been actively promoting the cultivation and development of this strategic emerging sector. The health industry not only constitutes a vital part of Guangxi's innovation-driven development strategy but also ranks among the nine key innovation priorities designated by the region. Abun-

dant in traditional Chinese medicine (TCM) resources, Guangxi possesses natural ecological advantages such as longevity, health preservation, and wellness, earning it the titles of "Natural Medicine Treasury" and "Hometown of Chinese Medicinal Herbs" (Cao, Ou, Lin, Wei, Xie, & Chen, 2024). According to the 2021 Fourth National Survey on TCM Resources, Guangxi is home to 7506 species of medicinal resources, accounting for approximately one-third of the country's total medicinal plants. Among these, Zhuang and Yao ethnic medicines are particularly distinctive and hold significant potential for development, providing substantial support for the growth of the health industry (Zhong, 2022).

Baise serves as a typical example of Guangxi's "Natural Chinese Medicine Treasury". Its complex geographical environment and unique climatic conditions have fostered a rich diversity of medicinal resources (Luo & Xu, 2020). Taking the Jingxi Dragon Boat Festival Herb Market in Baise as an example, in 2019 (before the COVID-19 pandemic), the market recorded a transaction volume of over 800 tons of medicinal materials, with a total turnover exceeding 6.8 million yuan. Since the introduction of the "Modernization of Traditional Chinese Medicine" strategy in 1996, which has been implemented for over 25 years, significant progress has been made in production techniques and formulation technologies. However, the overall outcomes have not been fully satisfactory, and numerous challenges remain unresolved, hindering the further advancement of China's natural medicinal materials industry.

With the rapid development of the health industry, the demand for natural medicines with local characteristics in Guangxi continues to grow. Therefore, it is essential to draw on successful experiences from other countries, adopting their best practices. Currently, research on the translation of texts related to the health industry remains relatively underdeveloped in China. There is an urgent need to learn from international success stories to improve and promote the translation of popular science texts on natural medicines in China.

2. Popular Science Text on Natural Medicines—Medical Toxicology of Natural Substances: Foods, Fungi, Medicinal Herbs, Plants, and Venomous Animals

This study adopts Medical Toxicology of Natural Substances: Foods, Fungi, Medicinal Herbs, Plants, and Venomous Animals as a case example, aiming to develop a comprehensive and systematic understanding of the properties of natural medicines and to provide improved theoretical guidance for the health industry. Authored by Donald G. Barceloux, M.D., of the University of California School of Medicine, the work is intended for a general readership and falls within the category of popular science literature (Zhang, 2019).

The book primarily details the physical characteristics and medical toxicology of various species, including plants, animals, and fungi. It not only reviews the medicinal history of different plants and analyzes their chemical constituents but also integrates clinical performance data to propose practical response strategies. Furthermore, it offers detailed descriptions of the applications, dosage, and usage

methods of commonly encountered plants, animals, and other species. Additionally, the text covers topics such as natural toxins, drug abuse, and overdose, providing readers with valuable scientific knowledge and practical guidance. It thus serves as a concise yet authoritative reference for the public regarding the everyday use of related natural medicines.

3. Equivalence Translation Theory

"Equivalence" stands as one of the core concepts in Western translation theory and has long garnered extensive attention from scholars both domestically and internationally. The concept was initially proposed by E.V. Rieu, followed by Roman Jakobson's "equivalence in difference" and John Catford's "textual equivalence". Subsequently, Eugene A. Nida further advanced the discussion with his "Functional Equivalence Theory" (Agsebat & Elarafi, 2024).

Building upon prior research, Werner Koller redefined the concept of equivalence from multiple perspectives and levels. Koller argued that equivalence is not merely an abstract and unified concept but can be categorized into distinct types based on varying translation needs. Consequently, he proposed five types of equivalence: denotative, connotative, text-normative, pragmatic, and formal-aesthetic, which have profoundly influenced translation studies in both Eastern and Western contexts (Beddari, 2021).

1) Denotative equivalence refers to the preservation of the factual content of the source text in the translation, ensuring consistency in physical or factual meaning. 2) Connotative equivalence involves selecting synonyms to convey the associative meanings of the original discourse, thereby achieving equivalence in conceptual or ideological expression. 3) Text-normative equivalence emphasizes that different genres should adhere to specific linguistic conventions, ensuring the translation conforms to the stylistic features of particular text types. 4) Pragmatic equivalence places the target reader at the center, striving for alignment not only in linguistic form but also within the reader's cultural and contextual framework. 5) Formal-aesthetic equivalence focuses on the artistic features and authorial style of the source text, ensuring the translation conveys its original aesthetic qualities and formal beauty (Bakiev, 2025).

4. Applicability of Koller's Equivalence Theory in the Chinese Translation of Natural Medicine Popular Science Texts

Natural medicine popular science is a genre that integrates medicine and science, aiming to disseminate medical knowledge. It is characterized not only by scientific rigor but also by accessibility and an engaging quality. The book Medical Toxicology of Natural Substances: Foods, Fungi, Medicinal Herbs, Plants, and Venomous Animals primarily introduces the physical, chemical, and medical toxicological properties of various species such as plants, animals, and fungi. Its language is precise, its grammar clear, and it also possesses a degree of literary flair and readability (Zhang, 2019). Therefore, during the translation process, it is essential to

fully consider these multifaceted linguistic features to achieve equivalence between the source and target languages.

Koller's Equivalence Theory encompasses five types of equivalence: denotative, connotative, text-normative, pragmatic, and formal-aesthetic. This framework assists translators in selecting appropriate target language expressions from multiple perspectives and by integrating various factors. Koller's theory is highly inclusive and broadly applicable, providing a solid theoretical framework for translation practices across diverse text types (Bakiev, 2025).

First, Koller categorized denotative equivalence into five types: one-to-one, one-to-many, many-to-one, one-to-part, and one-to-zero correspondence. These categories comprehensively cover the various equivalence relationships that may arise during lexical translation. This framework is particularly crucial for translating *Medical Toxicology of Natural Substances*: *Foods*, *Fungi*, *Medicinal Herbs*, *Plants*, *and Venomous Animals*, as the text presents numerous challenges such as Latin plant names, botanical terminology, chemical terms, and specialized medical vocabulary. When translating these terms, practitioners can apply Koller's five lexical correspondence types to select the most appropriate translation strategy, thereby ensuring accuracy and consistency in the target text.

Secondly, connotative equivalence deals with the subtle differences in lexical choice between the source and target texts, particularly the emotional connotations, socio-cultural implications, and associated metaphorical meanings of words. Koller regarded this type of equivalence as the most challenging in the translation process, as the connotations of words in different languages are often shaped by specific cultural backgrounds, contexts, and historical factors. Translators must not only grasp the cultural significance of words in the original text but also select vocabulary in the target language that evokes similar emotions or associations. The book *Medical Toxicology of Natural Substances*: *Foods*, *Fungi*, *Medicinal Herbs*, *Plants*, *and Venomous Animals* contains numerous specialized terms. When translating these terms, it is essential to maintain the accessibility expected of a popular science text while simultaneously ensuring precision and academic rigor in the translation.

Furthermore, linguistic norm equivalence requires translators to preserve the stylistic features and linguistic norms of the source text while ensuring the translation aligns with the cultural conventions and textual standards of the target language. This principle emphasizes similarity between source and target texts in terms of linguistic structure, discourse organization, and style, with the aim of enabling the target audience to comprehend the content within a familiar textual framework. As a popular science book, *Medical Toxicology of Natural Substances*: *Foods*, *Fungi*, *Medicinal Herbs*, *Plants*, *and Venomous Animals* exhibits distinct stylistic characteristics. Therefore, achieving equivalence between the source text and the translation is particularly important to ensure that the translated version not only adheres to the style of popular science literature but is also effectively understood by the target readers.

Fourth, pragmatic equivalence focuses on the audience-oriented nature of the

translated message, assessing whether the target text can achieve a communicative effect in the target culture similar to that of the source text. Pragmatic equivalence emphasizes the actual function and meaning of the translation within a specific cultural context, requiring translators to fully consider the cultural background, psychological characteristics, and reception capacity of the target audience. As popular science literature is essentially written by experts for non-specialists, it aims to allow readers to easily acquire relevant knowledge without prior expertise. Therefore, during translation, particular attention must be paid to the target readers' experience, ensuring they can effectively absorb the information.

Finally, formal-aesthetic equivalence focuses on the formal and aesthetic effects of the text, including phonological rhythm, syntactic structures, rhetorical devices, and other aesthetic features of the source text. Koller emphasizes that during the translation process, attention should be paid not only to the formal characteristics of the original but also to its aesthetic qualities. The language of *Medical Toxicology of Natural Substances*: *Foods*, *Fungi*, *Medicinal Herbs*, *Plants*, *and Venomous Animals* is precise and scientific, yet it also contains sentences with literary qualities. When translating such sentences, it is essential to preserve their aesthetic effect, achieving equivalence in aspects such as rhythm or metaphor, thereby ensuring a unity of form and language.

5. Conclusion

Koller's equivalence theory offers a comprehensive and inclusive framework that holds significant influence in the field of translation studies. While previous research has predominantly focused on Nida's functional equivalence theory, the application of Koller's model in translation practice—particularly within the genre of popular science texts—has received relatively less attention (Beddari, 2021). Grounded in a thorough understanding of Koller's framework and the linguistic characteristics of popular science writing, this study proposes specific methods and techniques for achieving equivalence across five dimensions: denotative, connotative, text-normative, pragmatic, and formal-aesthetic. It thereby provides theoretical guidance for future translation practice in this domain. Although the current research primarily examines the applicability of Koller's theory from a conceptual perspective, future studies will delve deeper into its practical implementation through concrete case analyses.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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