A Comparative Analysis of Chinese-English Translation Quality Based on ChatGPT: A Case Study of Chinese Characteristic Words

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Abstract: *The release of ChatGPT, a large-scale natural language interactive program, at the end of 2022 has once again garnered worldwide attention to artificial intelligence technology. As a deep learning-based natural language processing model, ChatGPT demonstrates unique advantages in the field of translation that are unparalleled by previous machine translation software. Chinese characteristic words, which lack direct equivalents in other cultures or countries, have always posed a challenge in Chinese-English translation, but they are also an essential part of effectively conveying the Chinese story. This article selected some Chinese characteristic words mentioned in the Chinese Government Work Report as translation materials and asked ChatGPT with completing tasks such as translating and polishing the translation according to instructions. By comparing the official Chinese-English translation version and traditional machine translation version, this article analyzed the translation quality of ChatGPT in C-E translation from the perspectives of syntactic structure, coherence, and domain adjustment, with the aim of summarizing machine-assisted translation methods and translation strategies for Chinese characteristic words.*

Keywords: ChatGPT; Chinese characteristic words; machine-assisted translation.

1. INTRODUCTION

On November 30th, 2022, ChatGPT, a chatbot model developed by OpenAI, an American artificial intelligence research laboratory, took the internet by storm. Within just 5 days of its launch, it attracted millions of registered users. The success of this model can be attributed not only to its deep training based on massive internet data but also to a machine learning technique called Reinforcement Learning from Human Feedback (RLHF) (Hurst 2023). To use ChatGPT's translation feature, users input prompts that include translation requirements and the original text. The model then generates the corresponding translation results. Users can also engage in conversation to ask ChatGPT to proofread and refine the translation, such as making the sentence structure more complex or using more authentic expressions. They can even request the model to search for parallel texts to enrich the translation content (Pym 2023). It is precisely this flexible interactive mechanism that makes ChatGPT's responses more natural and human-like, rather than mechanically replicating the text it learned during training. Mike Sharples (2023), an educational technology professor at the Open University in the UK, pointed out that "OpenAI's language model is creating an internal representation of language that encompasses not only the literal meaning of words but also the thoughts and deep-level concepts behind the language." This viewpoint highlights the model's ability to deeply understand and translate cultural connotations and Chinese-specific terms that are difficult to translate directly, giving it a significant advantage.

2. LITERATURE REVIEW

Currently, there is a lack of research literature comparing the translation quality of ChatGPT. Relevant studies mainly evaluate ChatGPT's translation quality using automatic evaluation metrics such as BLEU and CHRF, as well as the opportunities and challenges brought by ChatGPT translation in foreign language teaching (Geng Fang & Hu Jian 2023). Additionally, studies by Rudolph et al. (2023) and Bang et al. (2023) found that in translation tasks involving Chinese, English, German, and Romanian, ChatGPT's translation quality is comparable to that of Google Translate, DeepL, and other traditional translation tools. However, it performs far worse in translating between distant languages compared to these traditional tools, and its stability in translating biomedical texts and online community messages is also inferior to the latter.

Regarding Chinese characteristic word, it has the following features: first, it has a strong Chinese cultural feature; second, it contains rich Chinese cultural connotations; third, it is difficult to find corresponding vocabulary in the target language (Cai Honggai 2011). Compared to traditional machine translation methods (based on established

rules, statistics, and case-based methods) (Xie Xiaoping & Zhou Limin 2019), ChatGPT's translation function adopts a brand-new approach. This approach has potential in the field of Chinese-English translation of characteristic vocabulary, providing a more flexible and innovative solution for translation.

3. COMPARISON ANALYSIS OF CHATGPT C-E TRANSLATION QUALITY

As an official government document, the Chinese Government Work Report outlines the expected goals and plans for the government's work in the upcoming year, based on the current economic and social development of the country (Xu Zhi & Zhang Jianchao 2020). The report covers a wide range of political, economic, cultural, and social terms that are unique to China. These terms not only provide important insights for foreign countries to understand our country's major policies, but also pose challenges in Chinese-English translation. To address this issue, this study used ChatGPT as the translation tool, focusing on the Chinese characteristic words found in the Chinese Government Work Report. The study conducts a comparative analysis and research on the translation quality of Chinese-English translation, with a particular focus on abbreviations, idioms, political neologisms, and terms with Chinese background. The official translation version and machine translation versions represented by Google Translate are used as comparison.

3.1 Abbreviations

In his book My Country and My People, language expert Lin Yutang (1994) noted that the highly monosyllabic nature of the Chinese language lends itself to a concise style. The skilled use of this style in Chinese reflects a relentless pursuit of perfection in word choice. As a result, Chinese often employs various abbreviations, which are short forms of words or phrases that are characterized by regionalism, professionalism, contemporaneity, informativeness, conciseness, and convenience. The use of this structure adheres to the principle of linguistic economy. If a word or phrase is long and complex, and is frequently used, people will create an abbreviation to compress the information. Most Chinese abbreviations belong to the political and cultural fields, and have distinct characteristics of the times and the nationality. Additionally, numerical abbreviations have the highest frequency of use, and they may be popular terms formed during a certain period. Regarding the translation of abbreviations, Zeng Jianping (2003) proposed four suggestions: literal translation, explanatory translation, literal translation with annotations, and initialism translation.

(1) "五位一体"总体布局，"四个全面"战略布局。

Official Translation (OT): Five-sphere integrated plan, Four-pronged comprehensive strategy.
Google Translate (GT): Five in one overall layout, Four comprehensive strategic layout.
ChatGPT: The overall layout of "Five-in-One" and the strategic layout of "Four-Comprehensives".

(2) 一带一路

OT: The Belt and Road Initiative (BRI)
GT: Belt and Road
ChatGPT: Belt and Road Initiative

In examples (1) and (2), none of the three translations provide an explanation for the abbreviations. They all choose to translate literally because these abbreviations, such as "一国两制(One Country, Two Systems)", "和平共处五项原则(Five Principles of Peaceful Coexistence)", and "三民主义(Three Principles of the People)", are widely used and familiar to English readers. The target readers already have a certain understanding of these abbreviations, so there is no need for explanatory translation. However, in example (1), ChatGPT and Google's translations have relatively informal word choices compared to the official version, which fails to reflect the formality of official documents. In example (2), both the official and ChatGPT translations add the word "Initiative" to indicate that the abbreviation is an initiative rather than a strategy or plan. This also demonstrates China's attitude in proposing this viewpoint. Compared to Google's literal translation, ChatGPT better conveys this underlying meaning.

(3)更多采取改革的办法，更多运用市场化、法治化手段，巩固"三去一降一补"成果。

OT: We will use more reforms and means in accordance with market principles and law to consolidate the gains made in the five priority tasks.

GT: Adopt more reform methods, use more market-oriented and legal means, and consolidate the achievements of "three eliminations, one reduction and one supplement".

ChatGPT: More reforms will be adopted, and more market-oriented and rule-of-law approaches will be employed to consolidate the achievements of "Three Supply-Side Structural Reform Tasks" while pursuing "Three Reductions and One Substitution".

In example (3), the context implies the discussion of "cutting overcapacity, reducing excessive inventory, deleveraging, lowering costs, and strengthening weak links", which is known as "three reductions, one control, and one supplement". Therefore, the translation does not need to repeat the specific content of the abbreviation. This follows the principle of economy in language expression. The official translation uses a free translation strategy, summarizing the connotation of the abbreviation as "five tasks". However, Google's translation lacks the ability to analyze and summarize the content of the original text, resulting in an incomprehensible translation. ChatGPT accurately conveys the implied meaning of "supply-side structural reform", which is not mentioned in the official translation, but falls short in the translation of "three reductions, one control, and one supplement", and even makes mistakes of omission.

3.2 Idioms

Idioms are concise and powerful phrases or sentences that have been widely used over a long period of time. They typically consist of four Chinese characters, and while some idioms can be understood literally, others require knowledge of their background or allusions (2005). Each ethnic group has its own unique culture, resulting in idioms that differ in structure and characteristics. When translating idioms, it is important to preserve their original cultural structure. Translation strategies such as literal translation, free translation, or literal translation with explanation can be employed (He Yongbin 2016).

(4)为政以公，行胜于言。

OT: Government works for the public; words can't compare with actions.
GT: To govern with the public, deeds speak louder than words.
ChatGPT: To govern with fairness, actions speak louder than words.

In example (4), all three versions employed a literal translation strategy. The official translation, notably, introduced the subject "government", effectively communicating the core meaning of the idiom. Conversely, the latter two versions struggled to deduce the sentence's subject from the context, leading to less precise translations. Additionally, ChatGPT still displays a bias in interpreting the term "公". Within the idiom "为政以公", "公" refers to the "general public" rather than "fairness". Both Google and ChatGPT also falter in accurately discerning the idiom's implicit intent. The government's endeavors prioritize the welfare of the people, emphasizing the work's purpose rather than employing the people as instruments to carry out the tasks. Regarding "行胜于言", the official translation underscores "action" over "words" by adjusting the word order and deploying a negative sentence. This rearranged structure aligns more closely with English language expression norms for emphasis. Although Google and ChatGPT aptly capture the implied comparative relationship within the idiom, their reliance on a literal translation strategy seems somewhat rudimentary and straightforward compared to the official translation. Consequently, they may not fully cater to the reading preferences of the target audience.

(5)不忘初心，牢记使命

OT: Stay true to the Party's founding mission.
GT: Do not forget the original intention, keep in mind the mission.
ChatGPT: Never forget why you started, and your mission.

"不忘初心，牢记使命" was first proposed by President Xi Jinping in the report of the 19th National Congress of the Communist Party of China on October 18, 2017. It was later selected as one of the top ten Chinese media buzzwords in 2017 by Beijing Language and Culture University, indicating its high degree of popularity. English readers are also familiar with this idiom. To express this phrase efficiently, a word-for-word translation strategy is not necessary. Similar to the official translation, an appropriate omission can make the translation more economical and efficient. Comparing the translations given by Google and ChatGPT, although ChatGPT is more concise, its wording is more colloquial and it fails to specify what kind of "mission" or "task" should be remembered.

3.3 Political Neologisms

A neologism is a newly coined term, word, or phrase that is gaining popularity but has not yet been fully accepted into mainstream language (Anderson, 2006). Political neologisms, as the name suggests, are new words that emerge in the political arena, often in relation to major political events, conferences, and significant policies formulated by the Chinese Communist Party and the state (Song Pingfeng & Zhang Chunyan 2016). It is well known that Government Work Reports contain the latest events and policies in our country, resulting in a large number of political neologisms. Therefore, it is crucial to accurately translate these words.

Translation of political neologisms has been a subject of scholarly discussion with various perspectives offered by experts in the field. Wang Xue and Cai Lihua (2013) had emphasized that political neologisms are characterized by their high degree of abstraction and conciseness, their close alignment with the evolving zeitgeist, and their relevance to a broad spectrum of societal facets. Wang Fei (2010) distilled five key attributes defining political neologisms: temporal novelty, emergence within distinct historical contexts, inherent policy orientation, a focus on communicative efficacy, and deep-rooted connections to Chinese cultural elements.

Therefore, translating political neologisms necessitates adherence to several essential prerequisites. Firstly, these neologisms are frequently on the cutting edge of their respective domains. Consequently, translators must possess a strong foundation in the relevant discipline to fully comprehend the source text. Secondly, a firm grasp of historical and cultural nuances is indispensable to capture the complete essence of these terms. Thirdly, political acumen is a requisite skill, enabling translators to navigate the intricate layers of meaning embedded in these neologisms. Lastly, translations should aspire to conciseness, reflecting the inherent brevity of political neologisms.

(6)结构性去杠杆

OT: Structural deleveraging
GT: Structural deleveraging
ChatGPT: Structural deleveraging

(7)精准脱贫

OT: Precision poverty alleviation
GT: Precise poverty alleviation
ChatGPT: Precision Poverty Alleviation

(8)社会主义核心价值观

OT: Core socialist values
GT: Socialist core values
ChatGPT: Core Socialist Values

Examples (6), (7), and (8) demonstrate that political neologisms typically exhibit a relatively straightforward structure and do not demand an extensive cultural background for translation. Consequently, there's no imperative need for exhaustive analysis of the source text during the translation process, and a literal translation strategy can be employed. However, despite Google Translate's expansive and constantly evolving corpus, it grapples with word selection and sentence construction. In contrast, ChatGPT's distinctive computational mechanism ensures complete alignment between the translation and the official version, establishing it as a more dependable choice.

3.4 Terms with Chinese Background

Terms with a Chinese background serve as linguistic expressions of local Chinese knowledge, marked by their inherent distinctiveness. However, in the realm of cross-cultural communication, this distinctiveness is further compounded by the diversity of other languages and cultures, introducing an added layer of complexity. The facets of conceptual transplantation, symbol conversion, and communicative adaptation contribute to this intricate landscape, thereby posing numerous challenges in the practice of cross-cultural knowledge dissemination (Wei Xiangqing & Yang Ping). These terms span a wide array of domains, encompassing Chinese history, culture,

economy, and politics, each laden with profound connotations. They do not adhere to a fixed word formation structure, often adopting a more colloquial and vivid language style. Furthermore, owing to their distinctive Chinese cultural underpinnings, finding equivalent expressions in English frequently proves to be a difficult task.

(9)对摘帽县和脱贫人口的扶持政策要保持一段时间，巩固脱贫成果。

OT: Support policies that apply to counties and populations that have recently been lifted out of poverty will be maintained for a period to consolidate progress in poverty alleviation.
GT: Support policies for Mao Mao counties and those who have been lifted out of poverty must be maintained for a period of time to consolidate the results of poverty alleviation.
ChatGPT: Support policies for Zhaiguan County and the population lifted out of poverty should be maintained for a period of time to consolidate the achievements in poverty alleviation.

In Example (9), "摘帽" is employed metaphorically to describe counties that were previously classified as impoverished but have since been uplifted from the poverty category. China Daily's explanation effectively captures this essence --- the removal of the poverty label from these counties. However, Google's transliteration not only falls short of conveying the original intent but also introduces confusion for English readers. ChatGPT similarly utilizes a transliteration strategy, and while its translation shows improvement over Google's, it still lacks the clarity needed for English readers to fully comprehend, unlike the official translation.

(10)使各项政策符合基本国情和客观实际，更接地气、更合民意。

OT: This will make sure that each of our policies fits the conditions and realities of our country, responds to people's desire, and better satisfies public demand.
GT: Make various policies consistent with basic national conditions and objective reality, and be more grounded and in line with public opinion.
ChatGPT: Make all policies in line with the basic national conditions and objective reality, more down-to-earth and more in line with public opinion.

In example (10), the original meaning of "接地气" is rooted in the idea of prioritizing the needs and interests of the people and to be in touch with their concerns. In the political context, it signifies government officials engaging frequently with the general public, comprehending their desires and requirements, and taking responsive actions. However, Google seems to only recognize the meaning of "地" and offers a literal translation as "grounded". Meanwhile, ChatGPT's choice of "down-to-earth" does capture the practical aspect but lacks in fully conveying the profound essence of the term.

4. CONCLUSION

By comparative analysis, the following conclusions can be drawn: in translating political neologisms or professional terminology, ChatGPT demonstrates significant advantages, with better accuracy, efficiency, and professionalism compared to Google Translate. Additionally, in translating some well-known Chinese idiomatic expressions, ChatGPT's translations are not inferior to official translations. When it comes to translating abbreviations and idioms, although ChatGPT's translations may not be comparable to official translations, traces of the original text can still be vaguely found in its translations. However, when faced with words that require rich background knowledge, ChatGPT struggles to convey their connotative meanings. Although ChatGPT's translation results are not as difficult to understand as Google Translate, there is still much room for improvement compared to official translations.

Due to the limitations of traditional machine translation, which can only search and match rules in a corpus to find the best translation results, it is unable to deeply analyze and explain terminology. However, the artificial intelligence technology represented by ChatGPT signifies a new kind of human-machine interaction experience. Moreover, ChatGPT is still in rapid development, and its computational engine is constantly upgrading. With the maturity of this technology, ChatGPT may possess the ability to analyze and transform the cultural connotations between Chinese and English, as hinted in its latest computational model GPT-4. Furthermore, the development of ChatGPT not only brings challenges to the translation industry but also creates new opportunities for human-machine collaboration. The model of AI-assisted translation will also drive continuous self-innovation in translation-related industries, academia, and research fields.

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