

A Study on ChatGPT Film and Television Subtitle Translation from the Perspective of Three-Dimensional Transformation---Take The Story of Minglan for example

Jiayi Meng

Moray House School of Education and Sport, The University of Edinburgh, Edinburgh, UK
Email: s2641303@ed.ac.uk

Abstract:

Based on the theory of Eco-translatology, this article conducts a study on the subtitle translation of the overseas version of the TV drama *The Story of Minglan* from the perspective of “three-dimensional transformation,” focusing on the translation generated by ChatGPT, and comparing them with Google Translation, Baidu Translation, and DeepL Translation, aiming to evaluate the effectiveness of ChatGPT in subtitle translation for films and television shows. Firstly, this research employs a quantitative analysis method by using two automatic assessment metrics, BLEU and TER, in order to quantify translation quality. Furthermore, case study and qualitative analysis methods are used to compare and analyze the differences in accuracy, linguistic fluency, and cultural adaptability between the YouTube subtitles of the overseas version of *The Story of Minglan* and the translation generated by ChatGPT from the perspectives of language, culture, and communication. The results indicate that while ChatGPT translations exhibit some readability, the model still shows limitations in handling ideological issues, cultural transmission, emotional capture, and translation accuracy.

Keywords: ChatGPT, Subtitle Translation, Three-Dimensional Transformation

1. Introduction

With artificial intelligence technology gathering momentum, machine translation has become a critical branch in the field of natural language processing (Wang et al., 2023), significantly enhancing the convenience of cross-linguistic communication. Against this backdrop, the rise of the ChatGPT language model has propelled artificial intelligence into a new developmental phase, bringing about a profound transformation in language, culture, and translation research. Currently, with increasing cultural exchanges between China and foreign countries, numerous Chinese film and television productions have garnered international acclaim. Simultaneously, a growing number of translation tasks, including subtitles for films and television programs, are being assisted or fully executed by artificial intelligence translation software, highlighting the crucial issue of translation quality.

Therefore, based on the ChatGPT model and NLTK corpus, this research takes the subtitle translation of the overseas version of the TV drama *The Story of Minglan* as an example from the perspective of “three-dimensional transformation.” It conducts comparative analysis be-

tween ChatGPT translation and other machine translation tools, incorporating automatic evaluation methods such as BLEU and TER, aiming to comprehensively assess the translation quality of the model from multiple aspects, analyze its strengths and limitations, and explore its potential to contribute to effectively narrating Chinese stories and promoting Chinese culture. This research is expected to provide valuable insights and inspiration for applying ChatGPT to the field of film and television subtitle translation, so as to serve as a reference and guide for the training needs and orientations of translators in the new era.

2. Current research at home and abroad

Regarding domestic research, film and television subtitle translation, as an essential link in cultural dissemination, has received widespread attention and research from domestic scholars. Wang Jingjing and Du Liping (2023) analyzed the translation of poetic verses in the American version of *Empresses in the Palace* as corpus, employing functional equivalence theory to dissect lexical and syntactic equivalence aspects. They noted ongoing im-

provement needed in poetic translation within subtitles, emphasizing the necessity for translators to deepen their understanding of both cultures. Liu Haiou and Li Xinlei (2024) evaluated the effectiveness of ChatGPT4.0 in translating Chinese idioms into English subtitles from a cognitive translation perspective. Their study involved comparing ChatGPT’s translation with those from traditional machine translation tools and assessing them using BLEU translation metrics, highlighting ChatGPT4.0’s potential in subtitle translation. Lu Tian (2023) used bilingual subtitles from the Oscar-winning documentary *American Factory* as an example, comparing official subtitles with those generated by three popular machine translation tools. This comparison illuminated the efficiency of machine-translated subtitles and their potential to produce high-quality subtitles, accompanied by feasible suggestions and proposals for enhancing subtitle translation quality to ensure accurate audience comprehension of the plot and emotions.

Concerning international research, Ananda, Hasan, and Thamrin (2019) analyzed subtitle translation of *Zootopia*, focusing on specific translation strategies and processes. They explored how to convey cultural nuances and humor elements in animated films and addressed challenges

and solutions during the translation process. Jose Ramon (2023) highlighted in his research that while machine translation offers advantages in efficiency and time-saving, concerns persist regarding its accuracy and reliability compared to human translation. Salvagno and Taccone (2023) discussed how ChatGPT can aid in material organization, initial draft generation, and proofreading but also cautioned about risks such as plagiarism and potential inaccuracies in expression or wording. Overall, current research on subtitle translation primarily centers on the application and evaluation of machine translation technologies. Existing studies have yet to fully explore the implications and challenges of translation in the era of artificial intelligence, particularly with emerging technologies like ChatGPT.

3. Data analysis

This study compares translation generated by ChatGPT with those produced by three other leading machine translation tools, and computes their respective BLEU scores and TER scores for ten selected examples using Python. The results of the BLEU scores and TER scores for the selected examples are presented in Tables 1, 2, 3, and 4.

Table 1 Translation Quality BLEU Index

Tool	Example 1	Example 2	Example 3	Example 4	Example 5
ChatGPT	0.10825	0.01571	0.13885	0.02509	0.03883
DeepL	0.1355	0.0319	0.18686	0.05186	0.04554
Baidu	0.12901	0.01605	0.17831	0.02454	0.02532
Google	0.02704	0.01429	0.07811	0.02643	0.02733

Table 2 Translation Quality TER Index

Tool	Example 1	Example 2	Example 3	Example 4	Example 5
ChatGPT	1.625	1.10000	0.76667	1.09677	1.04651
DeepL	0.96	0.92308	0.68421	0.90909	0.46956
Baidu	1.35294	1.09524	0.72727	1.06897	1
Google	1.31579	1.27778	2	0.86111	1.07317

Table 3 Translation Quality BLEU Index

Tool	Example 6	Example 7	Example 8	Example 9	Example 10
ChatGPT	0.02036	0.0279	0.02452	0.13015	0.17828
DeepL	0.06951	0.0216	0.08558	0.2599	0.04778
Baidu	0.01455	0.02384	0.04979	0.13844	0.1667

Google	0.03798	0.03336	0.05336	0.14963	0.03003
--------	---------	---------	---------	---------	---------

Table 4 Translation Quality TER Index

Tool	Example 6	Example 7	Example 8	Example 9	Example 10
ChatGPT	0.85714	0.8	1.00000	0.88235	0.66667
DeepL	0.9375	0.90909	1.03571	0.65	0.625
Baidu	1.5	0.83333	0.93103	0.875	0.60526
Google	1.05882	0.85714	0.05336	0.71429	0.96667

Based on the data shown in Figure 1 and Figure 3, this research calculates the BLEU scores for the translation of 10 example sentences. Statistical analysis reveals that DeepL Translation achieves the highest average BLEU score of 0.093603, followed by Baidu Translation with an average BLEU score of 0.076655. ChatGPT has an average BLEU score of 0.070794, while Google Translation has the lowest average BLEU score of 0.050057. According to Figure 2 and Figure 4, DeepL Translation exhibits the lowest average TER score at 0.810324, indicating superior translation quality, whereas Google Translation has the highest average TER score at 1.02349, manifesting relatively poorer translation quality. ChatGPT and DeepL Translation have average TER scores of 0.998904 and 0.810324 respectively, positioning them in an intermediate translation quality range.

These data indicate that none of the machine translation tools has achieved satisfactory translation quality in terms of adequacy and fluency of translation. There is substantial room for improvement in accurately conveying original intentions and achieving natural language fluency. However, among the four translation tools compared internally, DeepL Translation and ChatGPT demonstrate relatively superior translation quality, with results that closely matched the reference translation.

4. Analysis of Subtitle Translation of The story of Minglan

4.1 Adaptive transformation of language dimension

(1) At the level of vocabulary

Example 1: 与其扬汤止沸，不如釜底抽薪

YouTube official translation: Rather than trying to stop water from boiling over by scooping it up and pouring it back in, it is better to just take away the firewood from under the cauldron.

ChatGPT translation: Instead of treating the symptoms, it is better to address the root cause.

This sentence reflects Minglan’s insightful commentary

on her cousin’s troubled marriage when she returns to her hometown of Youyang. The official YouTube translation employs specific vocabulary and figurative expressions such as “stop water from boiling over by scooping it up and pouring it back in” and “take away the firewood from under the cauldron.” This choice of concrete vocabulary effectively conveys the imagery and metaphor of the original text, remaining faithful to its intended sentiment. Moreover, it assists readers in the target language to better grasp the idiomatic background and significance, thereby facilitating cultural transmission. In contrast, the ChatGPT translation, using phrases like “treating the symptoms” and “address the root cause,” leans towards generality and universality. While straightforward, it lacks specific imagery and metaphor, thus failing to fully convey the cultural and historical context of the original idiomatic expression. This may potentially diminish the cultural and visual impact of the original text.

(2) At the level of syntactic structure

Example 2: 有道是无功不受禄，又说反常即为妖

YouTube official translation: Reasons has it that one ought not to accept rewards undeservingly. And when the ordinary is changed, it is a demonic sign.

ChatGPT translation: According to the saying, one must earn merit to receive reward, and abnormality is deemed as demonic.

The sentence reflects the questioning of Wei Xiaoniang, who is pregnant and facing supplements akin to flowing water. In terms of syntactic features, the YouTube official translation employs the structure “Reasons has it that,” rendering the translation more formal and aligned with English cultural norms. Using expressions like “it is a demonic sign” adds a literary flair that resonates with the cultural understanding of the target audience. In contrast, the ChatGPT translation directly translates the Chinese “有道是” as “according to the saying,” utilizing common English expression structures and idiomatic phrases, facilitating readers’ easier comprehension and acceptance. With regard to sentence structure, the YouTube official

translation balances with coordinated clauses such as “one ought not to accept rewards undeservingly” and “when the ordinary is changed, it is a demonic sign,” connected tightly with the conjunction “And.” Conversely, the ChatGPT translation employs straightforward English expression methods with clear syntactic structure, resulting in a natural and fluent reading experience.

(3) At the level of discourse analysis

Example 3: 既入穷巷, 就应该及时掉头才是, 不可等一世消磨, 悔之晚矣

YouTube official translation: Since it is a blind alley, you should turn around immediately. You must not wait until your whole lifetime has been spent in regret, when it will be too late.

ChatGPT translation: Once you find yourself in a dead end, you should turn back promptly. Do not waste a lifetime and regret it when it is too late.

The sentence reflects Minglan’s advice to her cousin Shulan when returning to the Shenzhen family’s old residence, urging her to cut losses rather than persist in futile efforts. Concerning discourse logic and coherence, the official YouTube translation’s use of “Since it is a blind alley” explicitly identifies the reason for entering the “blind alley,” thereby laying a logical foundation for the subsequent suggestion to “turn around immediately,” enhancing coherence in the discourse. The phrase “You must not wait until your whole lifetime has been spent in regret, when it will be too late” further emphasizes the necessity and urgency of timely action through the proactive expression “must not wait until.” In contrast, the ChatGPT translation states, “Once you find yourself in a dead end,” directly describing the current situation and immediately suggesting “you should turn back promptly,” though logical, it lacks the explicit cause-effect relationship seen in the former. The sentence “Do not waste a lifetime and regret it when it is too late,” utilizing a parallel structure, also conveys the importance of timely action logically, yet with slightly less coherence and urgency compared to the YouTube translation.

In terms of language expression and style, the official YouTube translation employs a more formal and literary approach with phrases like “Since it is a blind alley” and “your whole lifetime has been spent in regret, when it will be too late,” fostering the literary quality and stylistic flair of the translation. This approach not only stays faithful to the tone and style of the original text but also reinforces the seriousness and cautionary tone of the translation. On the other hand, the ChatGPT translation uses a more colloquial and direct style with phrases such as “Once you find yourself in a dead end” and “Do not waste a lifetime and regret it when it is too late,” making the translation more concise and clear. While easier to understand, this

style may lack the literary quality and cautionary tone in the YouTube translation.

4.2 Adaptive selection transformation in cultural dimension

(1) Cultural idioms

Example 4: 今朝我嫁, 未敢自专; 四时入节, 不断香烟; 告知神明, 万望垂怜

YouTube official translation: I am getting married today, but I dare not act arbitrarily. I will continue to light incense for all of you the whole year round. Please tell the deities to pity me.

ChatGPT translation: Today I marry, not daring to act on my own, observing the seasons and rituals, continuously burning incense, informing the deities, hoping for their compassion.

This sentence is a prayer recited by Minglan in the family shrine before her marriage. The words in the example have profound symbolic meanings and traditional backgrounds in Chinese culture, involving marriage ceremonies, seasonal festivals, incense offerings, and prayers to deities. In the YouTube translation, phrases like “act arbitrarily” convey a sense of humility and obedience, while “pity me” expresses a plea for the deities’ compassion. The official translation attempts to convey the cultural characteristics and emotional tone of the source text in the target language through these phrases. On the other hand, ChatGPT’s translation more directly and literally conveys the meaning of the original text. For instance, it uses “not daring to act on my own” instead of “act arbitrarily” and “hoping for their compassion” instead of “pity me.” This choice focuses more on the direct conveyance of semantics and emotions, which may lead to the target readers’ misinterpretation of the cultural characteristics of the source text.

Example 5: 男婚女嫁, 理之自然; 有吉有庆, 夫妇双全; 无灾无难, 永保百年; 如鱼似水, 胜蜜糖甜

YouTube official translation: A man and woman getting married is the nature of things. Hope we both will be auspicious and full of celebration. Hope there are no disasters or difficulties, and we will be safe for hundreds of years. Like a fish in the water, let us be more sweet than honey.

ChatGPT translation: Men marry and women wed, it is natural; with blessings and celebrations, the couple is complete; free from calamity and hardship, may they live a hundred years; like fish in water, sweeter than honey.

This sentence reflects Minglan’s reverence and prayers for her marriage during her wedding. The YouTube official translation, “A man and woman getting married is the nature of things,” ensures the accurate conveyance of basic information and captures the cultural symbolism and idiomatic background of the original text. In contrast,

ChatGPT's translation, "Men marry and women wed, it is natural," is closer to a colloquial English expression, with "men marry and women wed" being more conversational. Additionally, the YouTube official translation, "Hope there are no disasters or difficulties, and we will be safe for hundreds of years," directly expresses the hope for a long-lasting and happy marriage, with "safe for hundreds of years" conveying the vision of long-term well-being. ChatGPT's translation, "free from calamity and hardship, may they live a hundred years," also conveys similar wishes, but uses less traditional phrasing, potentially losing some of the depth and emotional connection inherent in the traditional cultural context. Consequently, the traditional cultural value perceived in the text may not be as strong as in the official translation.

(2) Idioms & Proverbs

Example 6: 一家子的兄弟姐妹, 同气连枝, 共荣共损

YouTube official translation: A family of siblings are tree branches attached together. Together is their glory and together is their demise.

ChatGPT translation: The siblings in a family are like branches from the same tree, sharing in both good times and bad.

This sentence reflects the family honor and disgrace values imparted to Minglan by Nanny Kong. The Chinese idiom "同气连枝" describes siblings in a family being closely united, expressing the emotional bond and responsibility of mutual dependence, growth, and support among family members. The YouTube official translation, "A family of siblings are tree branches attached together," uses a direct metaphor of siblings as connected tree branches, emphasizing their shared fate and emotional ties. By using the metaphorical terms "glory" and "demise," it highlights the emotional experience of siblings facing joys and challenges together. This expression not only has cultural depth but also resonates emotionally, allowing readers to understand the cultural value and emotional depth embedded in the original text. Similarly, ChatGPT's translation uses "like branches from the same tree," attempting to convey a similar metaphorical meaning. This metaphor is common in English and helps readers understand the close relationship and shared experiences among siblings. However, ChatGPT's translation does not use culturally symbolic and emotionally rich terms like "glory" and "demise," as seen in the official translation. This may result in the translation lacking in conveying the cultural background and emotional nuances to the same extent.

Example 7: 父母之爱子, 则为之计深远

YouTube official translation: One should gauge for the far-reaching future.

ChatGPT translation: The love of parents for their children is profound.

This sentence reflects Wei Xiaoniang's concern and reluctance regarding Minglan, while also reminding her not to let down the care and love from the Old Madam and Lady Wang. The proverb emphasizes that parents' love for their children extends beyond immediate care to long-term planning and hope for their future. The YouTube official translation opts for a more direct and practical expression, which highlights not only the long-term plans embedded in the original text but also implicitly conveys the parents' emotions and hopes for their children's future. In contrast, ChatGPT's translation tends to maintain the formal structure of the language. While this approach is accurate, it is more formal and generalized than the YouTube official translation, which might create a sense of distance for the audience in understanding the emotions and specific context, making it harder to fully grasp the deep affection and thoughtful consideration conveyed in the original text.

4.3 Adaptive selection transformation in communicative dimension

(1) Communicative intention

Example 8: 若亲眷不能克己复礼, 携手共度, 眼下的经营终究是黄粱一梦, 随时倾覆

YouTube official translation: If relatives can not subdue themselves, observe proprieties, and live through times together hand in hand, everything you are managing now will just become dreamlike illusions and will be gone in an instant.

ChatGPT translation: If close relatives can not control themselves and follow proper manners to work together, their current efforts will ultimately be a fleeting dream, ready to collapse at any moment.

This sentence reflects Minglan's insightful understanding of family relationships. The YouTube official translation tends to use more vivid and expressive language to convey emotions. For instance, "subdue themselves" emphasizes the need for relatives to restrain their emotions and behaviors, while "live through times together hand in hand" directly illustrates the intimacy and shared experiences. Additionally, the choice of specific words and expressions in the YouTube official translation can more accurately convey the emotional tone of the original text. For example, phrases like "everything you are managing now will just become dreamlike illusions and will be gone in an instant" underscores the fleeting and illusory nature of reality, thereby deepening the emotional understanding of the original text. In contrast, ChatGPT's translation uses more general and abstract language, such as "control themselves" and "follow proper manners." These expressions focus more on linguistic accuracy and formality, which might make ChatGPT's translation appear relatively impersonal or less impactful in conveying emotions. It

may fail to fully capture the deeper emotions and nuances of the original text, making it harder for the audience to understand and experience the complexity and emotional shifts of the characters' inner worlds as they would with the YouTube translation.

In summary, from the perspective of communicative intentions, the YouTube translation better aligns with the requirements of the communicative dimension in ecological translation theory, as it focuses more on conveying emotions and intentions through language. This allows the audience to gain a deeper understanding of the plot and the characters' inner worlds in film and television works.

(2) Communication effect

Example 9: 我从来没有因你的薄待而怨恨，也从未因你的冷漠而生疏

YouTube official translation: I have never resented you for treating me poorly. And never let your indifference get the better of me.

ChatGPT translation: I have never resented your ignorance, nor have I ever grown distant because of it.

ChatGPT's translation adopts a literal translation approach, using words such as "resented," "ignorance," and "distant." These terms directly convey emotions and individual attitudes, enabling the audience to more deeply understand the emotions and intentions of the original text, thereby evoking greater emotional resonance and a deeper comprehension of the film's plot. In contrast, the YouTube official translation lacks direct emotional projection and vividness in conveying emotions and personalized expressions, which may result in the audience feeling somewhat distanced from the authentic emotional expression of the original text, impacting their understanding and emotional engagement.

Example 10: 吾钦慕汝已久，愿聘汝为妇，托付中馈，衍嗣绵延，终老一生

YouTube official translation: I have long admired you and am willing to marry you to be my wife, entrust you my house for you to manage, and entrust to you the propagation of my bloodline.

ChatGPT translation: I have long admired you and wish to take you as my wife. I entrust you with the household and hope to raise a family together, spending our lives together until the end.

This sentence reflects Gu Tingye's deep confession and commitment when proposing to Minglan. The YouTube official translation uses expressions like "admired you," "marry you to be my wife," "entrust you my house for you to manage," and "entrust to you the propagation of my bloodline." These phrases directly convey the cultural connotations of the original text, especially in retaining the concept of "bloodline" in "propagation of my bloodline," which highlights the Chinese cultural context of

lineage continuation and emphasizes the concept of family inheritance. In contrast, ChatGPT's translation opts for a more concise and modern approach, using phrases like "take you as my wife," "entrust you with the household," and "raise a family together." While these are clear and easy to understand, they have a weaker communicative effect. Overall, the YouTube official translation's choice of words better conveys the cultural characteristics and emotional expressions of the source language, meeting the communicative dimension adaptability requirements of ecological translation theory.

5. Conclusion

From a quantitative research perspective, ChatGPT outperforms mainstream translation tools available on the market in translating subtitles for the television drama *The Story of Minglan*. This demonstrates that ChatGPT already possesses a certain level of competitiveness among existing machine translation tools. From a qualitative research perspective, however, the limitations of the ChatGPT model are still evident in handling aspects such as ideology, cultural transmission, emotional capture, and translation accuracy.

Overall, ChatGPT has not yet fundamentally transformed traditional human translation or current machine translation tools. While it holds extensive potential for application in the field of machine translation, human translation remains crucial for texts with high cultural content and nuanced emotions. Therefore, translation professionals should focus on human-machine collaboration, incorporating adjustments and optimizations in practical applications to better utilize this technological tool. This approach will provide audiences with high-quality translations and effectively convey the emotions and cultural connotations of the film and television works.

References

- Wang, X., Chen, G., & Zhou, Y. (2023). Mapping the Structure of Cognitive Machine Translation Post-Editing Studies (2011—2021). *Journal of Foreign Languages*, 46(5), 90-100.
- Wang, J., & Du, L. (2023). Subtitle Translation of Poetic Lines in the American Version of "Empresses in the Palace" from the Perspective of Functional Equivalence. *English Square*, (19), 13-17.
- Liu, H., & Li, X. (2024). Evaluating ChatGPT's Translation of Chinese Idioms in Subtitles: A Cognitive Approach Through the Case Study of "The Story of Minglan". *ISRG Journal of Arts, Humanities and Social Sciences*.
- Lu, T. (2023). Applying machine translation to Chinese-English subtitling: Constraints and challenges. *Linguistica Antverpiensia, New Series-Themes in Translation Studies*,

22.

Ananda, F. R., Hasan, D. C., & Thamrin, T. (2019). An analysis of translation procedures found in the translation of movie subtitle: Zootopia. *Journal Polingua: Scientific Journal of Linguistic Literatura and Education*, 8(1), 11-15.

Calvo-Ferrer, J. R. (2023). Can you tell the difference? A study of human vs machine-translated subtitles. *Perspectives*, 1-18.

Salvagno, M., Taccone, F. S., & Gerli, A. G. (2023). Can artificial intelligence help for scientific writing?. *Critical care*, 27(1), 75.

Zhou, Z. (2023). The Application of ChatGPT in Translation Teaching: Changes, Challenges and Countermeasures. *Journal of Beijing International Studies University*, 45(5), 134.

Siu, S. C. (2023). ChatGPT and GPT-4 for professional translators: Exploring the potential of large language models in translation. *Available at SSRN 4448091*.

Chen, J., Hu, L., & Wu, F. (2023). Investigation into the Transformation of Knowledge-Centered Pedagogy with ChatGPT/Generative AI. *Journal of East China Normal University (Educational Sciences)*, 41(7), 177.