ПИТАННЯ ЗАГАЛЬНОГО І КОМПАРАТИВНОГО МОВОЗНАВСТВА, ПЕРЕКЛАДОЗНАВСТВА

DOI: https://doi.org/10.18524/2307–4558.2025.43.330756

UDC 811.581'25:004.8:82–31

WOESLER Martin,
Ph.D. in Chinese Studies, Professor, Distinguished Professor of Hunan Normal University; 36 Lushan South Road, Yuelu District, Changsha, Hunan, 410081, China; Academician, European Academy of Sciences and Arts, Salzburg, Austria; Research Associate, Media Design University, Berlin, Germany; Research Associate, Witten/Herdecke University, Witten, Germany; phone: +86 150 11388818; e-mail: woesler@hunnu.edu.cn;
ORCID ID: https://orcid.org/0000–0001–9254–0562.

STRATEGIES FOR TRANSLATING CULTURALLY LOADED INFORMATION FROM CHINESE IN THE CONTEXT OF ARTIFICIAL INTELLIGENCE: A QUADRILINGUAL COMPARATIVE STUDY

Summary. The ***purpose*** of this study is a comprehensive quadrilingual comparative analysis of machine and human translation approaches to culturally loaded information in contemporary Chinese literature. The ***object*** of analysis is the translation of culturally loaded linguistic units from Yu Hua's novel "Brothers" (兄弟) from Chinese into English, French, and German. This study compares human translations by professional translators with machine translations generated by ChatGPT and DeepL artificial intelligence systems across all three target languages. The research ***methodology*** employs systematic comparative analysis of material culture terms, stylistic units, and socioculturemes across four languages. Through comprehensive quadrilingual comparative analysis, this research ***concludes*** that cultural transfer strategies vary significantly between target languages and cultural contexts, while AI translation systems demonstrate consistent limitations across all target languages, particularly when dealing with emotionally nuanced content containing extensive background cultural and historical information. The study contributes to translation studies by providing systematic empirical evidence for the continuing necessity of human cultural expertise in literary translation while identifying specific areas where AI systems might serve as auxiliary tools.

Key words: culturally loaded information, artificial intelligence, machine translation, human translation, quadrilingual comparison, Chinese literature, Yu Hua, literary translation, cross-cultural communication.

Problem Statement

In the contemporary landscape of digital transformation and artificial intelligence advancement, the translation field confronts unprecedented opportunities and challenges regarding the comparative effectiveness of machine versus human translation methodologies. While certain domains increasingly favor automated translation solutions, literary discourse presents unique complexities that require sophisticated cultural knowledge and creative adaptation.

The translation of culturally loaded information represents a critical challenge in cross-cultural literary communication. Such information encompasses linguistic units that carry specific cultural connotations, historical contexts, and emotional associations that extend far beyond their semantic meaning. When examining contemporary Chinese literature, particularly works that span significant historical and social transformations, the adequate translation of culturally loaded elements becomes essential for preserving both aesthetic and cultural integrity.

Current artificial intelligence systems demonstrate remarkable capabilities in semantic accuracy and syntactic processing, yet their effectiveness in handling culturally loaded information remains underexplored, particularly in multilingual comparative contexts. The question of whether AI translation limitations are universal across different target language families or specific to certain linguistic and cultural contexts requires systematic investigation.

Research Questions and Hypotheses

This study addresses the following primary research questions:

1. How do human translators and AI systems differ in their approaches to translating culturally loaded information from Chinese literature into different European languages?

2. Are AI translation limitations in handling culturally loaded content universal across target language families, or do they vary according to specific linguistic and cultural contexts?

3. What patterns emerge when comparing translation strategies across Germanic (English, German) and Romance (French) language families?

Research Hypotheses:

• **H1**: Human translators demonstrate superior cultural adaptation capabilities compared to AI systems across all target languages examined.

• **H2**: AI translation limitations in cultural competence are universal rather than language-family specific.

• **H3**: Different target language families require distinct cultural adaptation strategies for effective translation of Chinese culturally loaded content.

Literature Review

Culturally Loaded Translation Theory

Culturally loaded information, as defined in linguoculturology, encompasses linguistic units that represent objects, phenomena, events, and cultural practices specific to particular national histories and cultural contexts (Nida, 1964; Vermeer, 1989). These units possess non-equivalent or background components that distinguish one culture from others, making their translation particularly challenging.

Eugene Nida's influential classification divides culturally loaded words into five categories: material, traditional-ethnographic, religious, social, and linguistic [12]. This taxonomic framework has gained widespread recognition and provides systematic approaches to analyzing cultural translation challenges. Recent scholarship has expanded this framework to include temporal and contextual dimensions [1; 9].

AI Translation and Literary Texts

Recent studies have examined AI translation capabilities in literary contexts, with mixed results. Research indicates that while AI systems excel in semantic accuracy, they face significant challenges in handling cultural nuances, register variations, and creative language use [4; 17].

Specific studies of Chinese-English AI translation reveal persistent difficulties with culturally specific terms, idiomatic expressions, and historical references [22]. However, most existing research focuses on bilateral language pairs, leaving multilingual comparative analysis underexplored.

Cross-Cultural Translation Studies

Cross-cultural translation research emphasizes the importance of cultural competence in addition to linguistic competence [2; 3]. Studies indicate that effective translation of culturally loaded content requires deep understanding of both source and target cultures, creative problem-solving abilities, and sensitivity to cultural adaptation needs [14; 18].

Research on Chinese literature translation has identified recurring challenges in conveying cultural specificity while maintaining accessibility for target culture readers. Previous studies have established systematic frameworks for analyzing AI translation of Chinese culturally loaded content, identifying consistent patterns of AI limitations in cultural adaptation [15; 16].

Research Methodology

Research Design

This study employs a comparative qualitative research design, analyzing translation approaches across four languages (Chinese source text plus English, French, and German target texts) using systematic content analysis methodology.

Corpus Selection

The research corpus consists of the first ten chapters of Yu Hua's novel "Brothers" [21] and their corresponding translations:

• **English**: Translated by Eileen Cheng-yin Chow and Carlos Rojas [5].

• **French**: Translated by Angel Pino and Isabelle Rabut [13].

• **German**: Translated by Ulrich Kautz [8].

AI Translation Systems

Contemporary AI translations were generated using:

• **ChatGPT-4** (OpenAI, 2024 version)

• **DeepL Translator** (DeepL GmbH, 2024 version)

Analytical Framework

The analysis employs a comprehensive three-category classification system for culturally loaded units established in translation studies scholarship. Material culturally loaded units encompass terms denoting material culture including food, clothing, and cultural locations that carry specific cultural connotations beyond their functional meaning. Stylistically colored units include paremias, euphemisms, and idiomatic expressions that convey cultural wisdom, social conventions, and figurative meaning em-

bedded in cultural contexts. Socioculturemes represent social, political, and historical cultural markers that reflect specific cultural values, power structures, and collective memory.

Data Collection and Analysis

Culturally loaded terms were identified through systematic reading of the source text and cross-referenced across all language versions to ensure comprehensive coverage of cultural elements. Translation strategies were categorized using established translation studies typologies developed by Vinay and Darbelnet [20] and Newmark [11], providing theoretical foundation for strategy classification. The comparative analysis examined translation strategy patterns across target languages to identify consistency or variation in approach, assessed the coherence of AI versus human translation methodologies, evaluated cultural adaptation effectiveness in preserving source culture meaning while achieving target culture accessibility, and analyzed register and style preservation across different linguistic and cultural contexts.

Analysis and Results

Material Culturally Loaded Units

Food Culture Translation Patterns

The translation of food-related culturally loaded terms reveals systematic differences between human and artificial intelligence approaches across all target languages. Human translators consistently employ cultural domestication strategies, adapting terms to familiar culinary vocabulary specific to each target culture's gastronomic traditions and social contexts. This approach demonstrates deep understanding of how food terminology functions within different cultural frameworks and social situations.

Example 1: 馒头 [mántou] — Steamed bread / bun

Language	Human Translation	ChatGPT	DeepL
English	steamed buns	mantou	steamed bread
French	petits pains à la vapeur	mantou	pain cuit à la vapeur
German	gedämpfte Brötchen	Mantou	gedämpftes Brot

Tab. 1: Example 1 馒头 [mántou] — **Steamed bread / bun**

The analysis of this basic Chinese food term across the four languages reveals distinct patterns in translation strategy. The English human translation „steamed buns"reflects familiarity with American Chinese restaurant terminology, making the concept immediately accessible to English-speaking readers while preserving the essential characteristics of the food item. The French translation "petits pains à la vapeur" employs traditional French bakery language that emphasizes the bread-making tradition central to French culinary culture, demonstrating cultural adaptation that resonates with French readers' culinary experiences. The German translation "gedämpfte Brötchen" draws on German bread culture, which holds particular significance in German-speaking countries, showing sensitivity to the cultural importance of bread varieties in German society.

In contrast, AI systems demonstrate consistent but limited approaches across all languages. ChatGPT uniformly transcribes the Chinese term as "mantou" across English, French, and German, suggesting a transcription strategy that preserves the foreign element but may leave readers without cultural context for understanding. DeepL provides functional descriptions in each language ("steamed bread," "pain cuit à la vapeur," "gedämpftes Brot"), focusing on the cooking method and basic food category while missing opportunities for cultural adaptation that would enhance reader comprehension and cultural accessibility.

Example 2: 三鲜面 [sānxiān miàn] — Three-fresh noodles

Language	Human Translation	ChatGPT	DeepL
English	house-special noodles	three-fresh noodles	triple-fresh noodles
French	nouilles aux trois délices	nouilles aux trois fraîcheurs	nouilles triple fraîcheur
German	Nudeln mit drei Köstlichkeiten	Drei-Frische-Nudeln	Nudeln mit drei frischen Zutaten

Tab. 2: Example 2 三鲜面 [sānxiān miàn] — **Three-fresh noodles**

This more complex culinary term demonstrates even greater divergence between human cultural adaptation and AI literal translation approaches. The English human translation „house-special noodles"reveals sophisticated cultural knowledge of American Chinese restaurant terminology, where „house special"indicates a premium dish with particular ingredients, conveying both the quality and local significance of this food item within Chinese restaurant culture. This choice demonstrates understanding of how Chinese cuisine has been culturally mediated in English-speaking contexts.

The French translation “nouilles aux trois délices” emphasizes culinary refinement through the term “délices” (delights), which draws on French gastronomic discourse that prioritizes pleasure, sophistication, and aesthetic appreciation in food description. This choice reflects French cultural values regarding cuisine as art and pleasure, demonstrating cultural adaptation that resonates with French literary and culinary traditions. The German translation “Nudeln mit drei Köstlichkeiten” creates a compound structure typical of German morphology while emphasizing the precious nature of the ingredients through “Köstlichkeiten” (delicacies), showing sensitivity to German linguistic patterns and cultural appreciation for food quality.

AI translations of this term remain significantly more literal and less culturally adapted. ChatGPT provides variations of “three-fresh noodles” or “nouilles aux trois fraîcheurs” and “Drei-Frische-Nudeln,” maintaining semantic accuracy but losing the cultural significance and premium connotations that the human translators successfully preserved. DeepL similarly offers functional descriptions that convey the basic concept while missing opportunities for cultural enhancement that would improve reader engagement and understanding.

Stylistically Colored Units

Proverbial Expression Translation

The translation of proverbial expressions presents particular challenges for cross-cultural communication, as these expressions encapsulate cultural wisdom, social values, and collective experience that may not have direct equivalents in target cultures. The analysis reveals sophisticated cultural knowledge among human translators who successfully identify appropriate target language equivalents that preserve both semantic meaning and cultural resonance, while AI systems demonstrate varying degrees of success depending on the availability of standardized equivalents in their training data.

Example 3: 有其父必有其子 [yǒu qí fù bì yǒu qí zǐ] — Like father, like son

Language	Human Translation	ChatGPT	DeepL
English	A chip off the old block	Like father, like son	The apple doesn’t fall far from the tree
French	Tel père, tel fils	Tel père, tel fils	Tel père, tel fils
German	Wie der Vater, so der Sohn	Wie der Vater, so der Sohn	Der Apfel fällt nicht weit vom Stamm

Tab. 3: Example 3 有其父必有其子 [yǒu qí fù bì yǒu qí zǐ] — **Like father, like son**

This classical Chinese expression about hereditary characteristics and family influence demonstrates the complexity of cross-cultural proverbial translation. The English human translation “A chip off the old block” represents sophisticated cultural adaptation that captures both the semantic meaning and the colloquial register appropriate for the narrative context. This choice demonstrates understanding that effective translation requires not just semantic equivalence but also cultural familiarity and appropriate register matching. The expression resonates with English speakers through its metaphorical imagery and common usage in family contexts.

The French translation “Tel père, tel fils” employs the classical French equivalent that carries literary and cultural resonance appropriate for the narrative context. This choice reflects the translator’s understanding of French literary tradition and the cultural significance of family heritage in French society. The parallel structure of the French expression mirrors the Chinese original while maintaining cultural authenticity. The German translation “Wie der Vater, so der Sohn” follows similar principles, using the established German equivalent that carries appropriate cultural weight and stylistic register.

AI systems show interesting variation in their handling of this proverbial expression. In English, ChatGPT provides the literal “Like father, like son” while DeepL offers “The apple doesn’t fall far from the tree,” both valid expressions but lacking the colloquial sophistication of the human choice. In French and German, both AI systems converge on the standard equivalents (“Tel père, tel fils” and “Wie der Vater, so der Sohn”), suggesting that these languages may have more standardized proverbial equivalents in AI training data. This pattern indicates that AI performance in proverbial translation may depend significantly on the availability of established equivalents rather than creative cultural adaptation capabilities.

Socioculturemes

Family Relationship Metaphors

The translation of metaphorical expressions for family relationships represents one of the most challenging areas for cross-cultural translation, as these terms often carry social judgments, emotional connotations, and cultural assumptions that vary significantly between societies. The analysis of such expressions reveals the creative problem-solving capabilities of human translators compared to the more literal and clinical approaches typically employed by artificial intelligence systems.

Example 4: 拖油瓶 [tuōyóupíng] — Children from previous marriage (literally "dragging oil bottle")

Language	Human Translation	ChatGPT	DeepL
English	excess baggage	baggage from previous marriage	burden from a previous relationship
French	boulets	fardeau d'un précédent mariage	charge d'une relation précédente
German	Klotz am Bein	Ballast aus früherer Ehe	Belastung aus einer früheren Beziehung

Tab. 4: Example 4 拖油瓶 [tuōyóupíng] — **Children from previous marriage (literally "dragging oil bottle")**

This Chinese metaphorical expression presents a particularly complex translation challenge, as it combines a physical action metaphor with social judgment about family structure. The literal meaning of "dragging an oil bottle" suggests burden and impediment, while the cultural context refers to children from previous marriages who are perceived as complications in new family relationships. The translation of this term reveals remarkable cultural creativity among human translators and significant limitations in AI systems' ability to handle metaphorical and culturally sensitive content.

The English human translation "excess baggage" demonstrates sophisticated cultural adaptation by finding a travel-related metaphor that preserves the burden concept while using imagery familiar to English speakers. This choice captures both the impediment aspect and the emotional weight of the Chinese expression while employing a metaphor that resonates with contemporary English speakers' experiences. The translation maintains the somewhat negative judgment implied in the original while using culturally appropriate imagery.

The French translation "boulets" represents particularly creative cultural adaptation, as this term literally means "cannonballs" but figuratively refers to burdensome people or situations. This choice demonstrates deep understanding of French colloquial language and cultural attitudes, as "boulets" carries exactly the right level of informal negativity and burden imagery to match the Chinese original. The metaphorical creativity shown in this translation exemplifies the cultural intelligence required for effective literary translation.

The German translation "Klotz am Bein" (literally "block on the leg") provides another example of creative metaphorical adaptation, using a physical impediment metaphor that parallels the Chinese burden concept while employing specifically German imagery. This expression is culturally appropriate and widely understood in German-speaking contexts, demonstrating the translator's ability to find equivalent metaphorical concepts across very different cultural and linguistic systems.

In stark contrast, AI systems provide uniformly clinical and literal descriptions that completely lose the metaphorical creativity and cultural resonance of the original expression. ChatGPT offers variations of "baggage from previous marriage" and "Ballast aus früherer Ehe" (ballast from earlier marriage), while DeepL provides "burden from a previous relationship" and similar clinical descriptions. These translations, while semantically accurate, fail to preserve the metaphorical creativity, emotional impact, and cultural specificity that make the original expression effective and that the human translators successfully maintained through their creative adaptations.

Cross-Linguistic Translation Patterns

Human Translator Strategies by Language Family

The analysis reveals distinct translation approaches that correlate with both language family characteristics and individual cultural contexts, demonstrating that effective translation requires understanding of specific target culture expectations rather than general linguistic competence. English translation characteristics emphasize pragmatic adaptation with a focus on functional communication that makes Chinese cultural content accessible to English-speaking readers. This approach shows comfort with cultural borrowing, incorporating foreign elements when they enhance rather than impede understanding, and demonstrates preference for colloquial register that maintains accessibility while preserving narrative authenticity. English translators also exhibit syntactic flexibility, willing to adapt Chinese sentence structures to English norms while preserving semantic and cultural content.

French translation characteristics reveal a distinct approach that emphasizes explicitation, providing more explanatory context and cultural background than other target languages. This tendency reflects French literary translation traditions that prioritize reader comprehension through detailed cultural mediation. French translators demonstrate consistent preference for literary register, choosing elevated vocabulary and sophisticated expression that aligns with French literary culture's emphasis on aesthetic refinement and linguistic precision. The translations show strong cultural sophistication, emphasizing aesthetic and intellectual appreciation that resonates with French cultural values regarding literature and art.

German translation characteristics display unique morphological integration through compound formation, taking advantage of German linguistic capabilities to create new terms that preserve Chinese concepts while conforming to German word formation patterns. German translators consistently prefer literary register, choosing vocabulary that reflects German literary tradition's comfort with elevated

and formal expression. The translations demonstrate strong cultural domestication, adapting Chinese cultural content to German cultural frameworks and expectations, while maintaining semantic precision through specific vocabulary choices that capture nuanced meanings often lost in more general translations.

AI System Performance Analysis

ChatGPT demonstrates morphological awareness particularly evident in German translation, where it shows sensitivity to compound formation patterns and attempts to create German-style compounds when appropriate. The system maintains register consistency across languages, applying similar levels of formality and vocabulary sophistication regardless of target language cultural expectations. ChatGPT shows transcription preference for cultural terms, often preserving Chinese terminology across all target languages rather than seeking cultural adaptation, and displays limited cultural adaptation capabilities, focusing on semantic accuracy rather than cultural resonance or reader accessibility.

DeepL exhibits systematic consistency across languages, applying parallel strategies regardless of target language family or cultural context. The system demonstrates functional communication focus, prioritizing practical understanding over cultural adaptation or aesthetic considerations. DeepL shows cultural neutralization tendency, systematically reducing culture-specific elements in favor of more general or universal concepts, and maintains modern vocabulary preference, choosing contemporary terms rather than historically or culturally appropriate expressions that might better match the source text's cultural and temporal context.

Discussion

Cultural Competence Hierarchies

The comprehensive analysis reveals distinct hierarchies of cultural competence that emerge consistently across all target languages and cultural contexts examined. Human translators demonstrate the highest level of cultural competence through their ability to provide language-specific cultural adaptation that responds to the particular needs and expectations of each target culture. Their translations show creative metaphorical solutions that preserve source culture meaning while achieving target culture accessibility, often through innovative approaches that bridge cultural gaps without sacrificing authenticity. Human translators consistently demonstrate historical and social contextualization, placing culturally loaded terms within appropriate temporal and social frameworks that enhance reader understanding. They also show sophisticated register and style sensitivity, maintaining appropriate levels of formality, colloquialism, and literary sophistication that match both source text intentions and target culture expectations.

Advanced AI systems such as ChatGPT exhibit medium-level cultural competence, characterized by basic cultural term recognition that allows them to identify when terms carry cultural significance beyond their literal meaning. These systems show some morphological awareness, particularly evident in German translation where they attempt to create compounds appropriate to German linguistic patterns. However, their cultural adaptation remains limited, often failing to move beyond literal translation to achieve meaningful cultural bridging. Their register management proves inconsistent, sometimes matching appropriate levels of formality but often flattening stylistic distinctions that are crucial for effective literary translation.

Functional AI systems like DeepL demonstrate the lowest level of cultural competence, with primary focus on semantic accuracy rather than cultural resonance or adaptation. These systems exhibit systematic cultural neutralization, reducing culture-specific elements to more general concepts that may be universally understood but lack the cultural richness and specificity that make literary translation effective. They employ generalization strategies that prioritize broad comprehensibility over cultural authenticity, and consistently flatten register distinctions, treating all text as equivalent information transfer tasks regardless of stylistic or cultural requirements.

Cross-Linguistic Cultural Transfer

The study reveals that cultural transfer effectiveness depends significantly more on individual cultural contexts and translator cultural intelligence than on language family relationships or structural linguistic similarities. Despite English and German both belonging to the Germanic language family, they demonstrate markedly different cultural adaptation strategies that reflect their distinct cultural contexts, historical experiences, and literary traditions. English translations tend toward pragmatic accessibility and cultural borrowing, while German translations emphasize literary register and morphological integration, showing that shared linguistic ancestry does not predict translation approach.

French demonstrates distinct Romance language characteristics, particularly in its tendency toward explicitation and aesthetic refinement, but these characteristics appear to stem more from French literary culture and translation traditions than from broader Romance language family traits. The evidence suggests that cultural transfer success depends on translators' deep understanding of specific target

cultures rather than general linguistic competence or language family knowledge. Effective translation requires cultural intelligence that encompasses historical awareness, social sensitivity, aesthetic judgment, and creative problem-solving capabilities that extend far beyond linguistic skill.

AI Translation Limitations

AI systems demonstrate remarkably consistent limitations across all target languages examined, suggesting that current challenges in AI translation stem from fundamental technological constraints rather than language-specific problems. The most significant limitation involves cultural creativity deficit, where AI systems consistently fail to generate culturally appropriate metaphorical solutions that preserve source meaning while achieving target culture resonance. This limitation appears across all categories of culturally loaded content, from simple food terms to complex social relationships, indicating a fundamental gap in creative cultural adaptation capabilities.

Register insensitivity represents another universal AI limitation, manifesting as systematic flattening of stylistic and social distinctions that are crucial for effective literary translation. AI systems tend to treat all text as equivalent information transfer tasks, missing the subtle gradations of formality, colloquialism, and literary sophistication that human translators navigate expertly. This limitation proves particularly problematic in literary translation, where register and style carry significant meaning and contribute to aesthetic effect and cultural authenticity.

Contextual blindness emerges as a persistent AI weakness, evidenced by focus on individual terms rather than narrative integration and cultural coherence. AI systems often provide accurate translations of isolated cultural terms while missing the broader cultural and narrative contexts that determine appropriate translation strategies. This limitation results in translations that may be semantically correct but culturally inappropriate or aesthetically jarring within the larger work. Cultural neutralization represents perhaps the most systematic AI limitation, involving consistent reduction of culture-specific elements in favor of more general or universal concepts that sacrifice cultural richness and authenticity for broad comprehensibility.

Conclusions

This quadrilingual comparative analysis provides systematic evidence for the continuing necessity of human cultural expertise in literary translation while revealing consistent patterns of AI limitation across diverse target languages.

Key Findings

Cultural competence primacy emerges as the most significant finding, demonstrating that human translators' superior performance stems fundamentally from cultural creativity and contextual sensitivity that remains beyond current AI capabilities. This superiority manifests not merely in linguistic accuracy but in the ability to navigate complex cultural negotiations that preserve source meaning while achieving target culture accessibility and aesthetic effectiveness. Human translators consistently demonstrate creative problem-solving abilities that generate innovative solutions to seemingly untranslatable cultural concepts, while maintaining sensitivity to register, style, and cultural appropriateness that AI systems cannot replicate.

Universal AI limitations represent another crucial finding, as AI translation systems show remarkably consistent cultural competence limitations across all target languages examined, suggesting fundamental technological challenges rather than language-specific problems. These limitations appear to stem from current AI systems' inability to understand cultural context, generate creative adaptations, and navigate the complex negotiations between source and target cultures that effective literary translation requires. The consistency of these limitations across diverse target languages indicates that addressing them will require fundamental advances in AI cultural intelligence rather than language-specific improvements.

Target culture specificity emerges as a key insight, revealing that effective cultural transfer requires deep knowledge of individual target cultures rather than general linguistic competence or language family familiarity. Translators must understand not only linguistic structures but also cultural values, social conventions, historical contexts, and aesthetic traditions that shape how translated content will be received and interpreted. This finding challenges assumptions about the primacy of linguistic competence in translation and emphasizes the cultural intelligence required for effective cross-cultural communication.

Creative adaptation necessity represents perhaps the most important theoretical finding, demonstrating that the most effective translations require creative cultural adaptation that preserves source meaning while achieving target culture accessibility and aesthetic authenticity. This creative dimension distinguishes human translation from mechanical transfer and explains why AI systems, despite impressive semantic accuracy, remain inadequate for literary translation tasks that require cultural sensitivity and creative problem-solving.

Implications for Translation Practice

The findings suggest that AI systems serve most effectively as auxiliary tools for semantic understanding while human expertise remains essential for cultural adaptation, creative problem-solving, and register management in literary translation.

Future Research Directions

This study establishes comprehensive methodology for systematic Chinese literary translation analysis that provides foundation for extensive future research programs. The analytical framework developed through this quadrilingual comparison could be productively extended to additional Yu Hua works, including his short story collections, essays, and other novels, to determine whether the patterns identified in "Brothers" represent consistent characteristics of Yu Hua's cultural loading strategies or vary across different works and genres. Such expansion would contribute to comprehensive understanding of how contemporary Chinese authors employ culturally loaded content and how different translation approaches affect cross-cultural literary communication.

The methodology could also be applied to other contemporary Chinese authors to test the universality of identified patterns and determine whether the translation challenges and AI limitations observed in Yu Hua's work represent broader phenomena in Chinese literary translation or author-specific characteristics. Potential applications might include analysis of works by Mo Yan, Can Xue, Wang Anyi, Tie Ning, and other significant contemporary Chinese writers, providing comparative data that would enhance understanding of cultural transfer challenges across different literary styles and thematic concerns.

Reader reception studies represent another crucial research direction, involving cross-cultural analysis of how different translations are received, interpreted, and appreciated by target culture readers. Such studies would provide empirical evidence for the effectiveness of different translation strategies and cultural adaptation approaches, helping to validate theoretical insights about cultural competence and translation effectiveness. Additionally, temporal analysis of AI translation development using consistent methodology would allow researchers to track improvements in AI cultural competence and identify persistent limitations that require fundamental technological advances rather than incremental improvements.

The research contributes to translation studies by providing empirical evidence for human-AI collaboration models in literary translation while identifying specific areas for AI system improvement in cultural competence.

Acknowledgments

Co-funded by the European Union. Views and opinions expressed are however those of the author only and do not necessarily reflect those of the European Union [101126782].

References

1. Aixelá, J. F. (1996), "Culture-specific items in translation", *Translation, Power, Subversion. Topics in Translation*, Alvarez, R. and Vidal, M. C.-A. (Eds.), Vol. 8, *Multilingual Matters*, Bristol, pp. 52–78. DOI : https://doi.org/10.21832/9781800417915–005.

2. Baker, M. (2018), *In Other Words : A Coursebook on Translation*. 3rd ed. London : Routledge, 390 p.

3. Bassnett, S. (2014), *Translation Studies,* 4th ed. London : Routledge, 208 p.

4. Castilho, S., Doherty, S., Gaspari, F., & Moorkens, J. (2021), "Approaches to human and machine translation quality assessment", *Translation Quality Assessment*, Springer publishers, Chapter 2, pp. 9–38. DOI : https://doi.org/10.1007/978–3–319–91241–7_2.

5. Chow, E. C., & Rojas, C., trans. (2009), *Brothers : A Novel,* by Yu Hua, Pantheon Books, New York, 641 p.

6. Gao, R., Lin, Y., Zhao, N., & Cai, Z. G. (2024), "Machine translation of Chinese classical poetry : A comparison among ChatGPT, Google Translate, and DeepL translator", *Humanities and Social Sciences Communications*, Vol. 11, Issue 1, pp. 1–10. DOI : https://doi.org/10.1038/s41599–024–03363–0.

7. Guerberof-Arenas, A., & Toral, A. (2020), "The impact of post-editing and machine translation on creativity and reading experience", *Translation Spaces*, Vol. 9, Issue 1, pp. 155–186. DOI : https://doi.org/10.1075/ts.20035.gue.

8. Kautz, U., trans. (2009), *Brüder,* by Yu Hua, S. Fischer Verlag, Frankfurt am Main, 766 p.

9. Leppihalme, R. (1997), *Culture Bumps : An Empirical Approach to the Translation of Allusions*, Multilingual Matters, Clevedon, 240 p.

10. Moorkens, J., Toral, A., Castilho, S., & Way, A. (2018), "Translators' perceptions of literary post-editing using statistical and neural machine translation", *Translation Spaces*, Vol. 7, Issue 2, pp. 240–262. DOI : https://doi.org/10.1075/ts.00015.moo.

11. Newmark, P. (1988), *A Textbook of Translation,* Prentice Hall, London, 293 p.

12. Nida, E. A. (2021), *Toward a Science of Translating,* Brill, Leiden, 341 p.

13. Pino, A., & Rabut, I., trans. (2010), *Frères,* by Yu Hua, Actes Sud, Arles, 1017 p.

14. Pym, A. (2014), *Exploring Translation Theories,* 2nd ed., Routledge, London, 192 p. DOI : https://doi.org/10.4324/9781315857633.

15. Stepanov, Ie. N., Ma, X. (2021), "Linguocultural features of Russian and Chinese phraseological units with pragmatonyms", *Mova*, Vol. 36, pp. 22–28. DOI : https://doi.org/10.18524/2307–4558.2021.36.249728.

16. Stepanov, Ie. N., Wang, Zh. (2024), “Strategies for translating culturally loaded information from Chinese in the context of the use of artificial intelligence (based on the translation of Yu Hua’s novel “To Live” / “活着»)”, *Mova*, Vol. 42, pp. 22–28. DOI : https://doi.org/10.18524/2307–4558.2024.42.325845.
17. Toral, A., Wieling, M., & Way, A. (2018), “Post-editing effort of a novel with statistical and neural machine translation”, *Frontiers in Digital Humanities*, Vol. 5, Article no. 9, pp. 1–11. DOI : https://doi.org/10.3389/fdigh.2018.00009.
18. Venuti, L. (2008), *The Translator’s Invisibility : A History of Translation,* 2nd ed., Routledge, London, 336 p.
19. Vermeer, H. J. (1989), “Skopos and commission in translational action”, *Readings in Translation Theory*, A. Chesterman (ed.), Oy Finn Lectura Ab, Helsinki, pp. 173–187.
20. Vinay, J. P., & Darbelnet, J. (1995), *Comparative Stylistics of French and English,* John Benjamins, Amsterdam, 394 p.
21. Yu, H. [余华] (2005–2006), 兄弟 [*Brothers*], Shanghai Literature and Art Publishing House, Shanghai, 256 p.
22. Zhang, L., & Wang, M. (2023), “Cultural competence in AI translation systems : A Chinese-English case study”, *Computational Linguistics*, Vol. 49, Issue 2, pp. 301–328.

ВЬОСЛЕР Мартін,
доктор філософії (PhD) з китайських досліджень, професор Хунаньського педагогічного університету;
вул. Лушань Південна, 36, район Юелу, м. Чанша, пров. Хунань, 410081, Китай; академік Європейської академії наук і мистецтв, Зальцбург, Австрія; науковий співробітник Університету медіадизайну, Берлін, Німеччина;
науковий співробітник Університету Віттен/Гердека, Віттен, Німеччина; тел.: +86 15011388818;
e-mail: woesler@hunnu.edu.cn; ORCID ID: https://orcid.org/0000–0001–9254–0562.

СТРАТЕГІЇ ПЕРЕКЛАДУ З КИТАЙСЬКОЇ МОВИ КУЛЬТУРНО НАВАНТАЖЕНОЇ ІНФОРМАЦІЇ В КОНТЕКСТІ ШТУЧНОГО ІНТЕЛЕКТУ: КВАДРАЛІНГВАЛЬНЕ КОМПАРАТИВНЕ ДОСЛІДЖЕННЯ

Анотація. ***Метою*** цього дослідження є всебічний квадралінгвальний компаративний аналіз машинних і людських підходів до перекладу культурно навантаженої інформації з текстів сучасної китайської літератури. ***Об'єктом*** аналізу є переклад культурно навантажених мовних одиниць із роману Юй Хуа «Брати» (兄弟) з китайської на англійську, французьку та німецьку мови. У цьому дослідженні зіставлено переклади, виконані людьми, що є професійними перекладачами, і машинні переклади, виконані системами штучного інтелекту ChatGPT і DeepL з китайської мови на вказані вище три цільові мови. У ***методології*** дослідження використано системний компаративний аналіз термінів матеріальної культури, стилістичних одиниць і соціокультурем у чотирьох мовах. Через усебічний квадрілінгвальний компаративний аналіз це дослідження приходить до ***висновку***, що стратегії культурного переносу суттєво відрізняються між цільовими мовами та культурними контекстами, тоді як системи ШІ-перекладу демонструють систематичні обмеження в усіх цільових мовах, особливо у випадках обробки емоційно нюансованого контенту, що містить обширну фоново культурну й історичну інформацію. Дослідження є актуальним внеском у вивчення перекладу, надаючи систематичні емпіричні докази для потреб подальшої людської культурної експертизи в літературному перекладі, одночасно визначаючи конкретні області, де системи ШІ можуть слугувати допоміжними інструментами.

Ключові слова: культурно навантажена інформація, штучний інтелект, машинний переклад, людський переклад, чотиромовний компаративний аналіз, китайська література, Юй Хуа, літературний переклад, міжкультурна комунікація.

Статтю отримано 8.04.2025 р.