

A Study on the Application of Human-AI Collaborative Translation in Bilingual WeChat Official Accounts for Traditional Chinese Medicine Culture

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Abstract

Against the backdrop of iterative digital media, bilingual WeChat Official Accounts have become a core platform for the international communication of Traditional Chinese Medicine (TCM) culture by virtue of their systematic content and sustainable communication capacity. Nevertheless, TCM is rich in culture-loaded concepts and sophisticated specialized terminology, while overseas online platforms impose strict constraints on medical publicity compliance. Under such circumstances, independent human translation or machine translation alone cannot balance translation output efficiency and textual quality. This paper introduces the concept of Human-AI Collaborative Translation (HACT). Combined with the textual characteristics of bilingual TCM WeChat Official Accounts, it constructs a closed-loop collaborative translation framework covering four links: pre-translation collaborative terminology construction, batch initial translation powered by artificial intelligence (AI), logical restructuring and cultural compensation conducted by human translators, and professional quality control by TCM specialists. This paper selects three mainstream bilingual WeChat Official Accounts of traditional Chinese medicine, extracts 15 popular science articles as analytical corpus according to unified screening criteria, and takes generic machine translation outputs as control samples. Qualitative analysis is carried out based on four evaluation dimensions: terminology accuracy, logical coherence, cultural adaptability and compliance. Through the analysis of three typical cases, this paper elaborates the potential application advantages of the proposed model in standardizing terminology, restructuring sentence patterns and realizing cross-cultural interpretation. The study reveals that HACT effectively removes cross-linguistic communication barriers for TCM, and delivers feasible practical approaches

and theoretical references for the high-quality, large-scale global dissemination of TCM culture in the new media era.

Keywords

Bilingual WeChat Official Accounts, Traditional Chinese Medicine Culture, Human-AI Collaborative Translation (HACT), Cross-Cultural Communication, New Media External Publicity

1. Introduction

With the rapid advancement of digital communication, graphic new media platforms have evolved into core carriers for the overseas dissemination of fine traditional Chinese culture. Platforms including WeChat Official Accounts and Weibo feature low operating costs, strong interactivity, rapid information transmission and long-term communication effects, which have made them mainstream promotional channels in the new media landscape (Dong et al., 2021). Among these platforms, bilingual WeChat Official Accounts stand out with systematic content, regular updates, standardized column settings and persistent communication effects. They break the limitations of fragmented, ephemeral short-video communication and serve as a vital medium for the long-term overseas promotion of TCM culture. Integrating text and images, bilingual TCM WeChat Official Accounts continuously release systematic content such as popular science on TCM theories, intangible cultural heritage herbal processing techniques and seasonal healthcare regimens, offering overseas audiences a critical window to understand traditional Chinese concepts of health.

However, TCM culture boasts highly composite attributes and contains numerous cultural-loaded concepts with no direct equivalents in Western languages, which poses tremendous challenges to cross-linguistic translation. Current translation practices for bilingual TCM WeChat Official Accounts fall into two extreme modes. Most official accounts adopt generative AI machine translation to translate texts rapidly. Though productive, such translations frequently suffer from inconsistent terminology, distorted cultural connotations and prohibited medical promotional claims, which severely damages China's international academic reputation. A small number of high-quality accounts adopt full human translation and proofreading. While their translations are polished, this mode incurs excessive labor costs and lengthy delivery cycles, failing to meet the demand for frequent, routine content updates of official accounts.

Given the above operational dilemmas, the inherent drawbacks of single-mode translation cannot be resolved. The translation industry urgently requires an innovative translation system that balances efficiency, textual quality and compliance. Against this background, this paper delineates the applicable boundaries between Large Language Models (LLMs) and human translators in processing TCM texts, and explores the implementable pathways of Human-AI Collaborative Translation

(HACT) for bilingual TCM WeChat Official Accounts, aiming to provide operable theoretical support for the digitalized, large-scale global outreach of TCM culture.

2. Multi-Dimensional Attributes of TCM Culture and Difficulties in Its Outward Translation

The TCM knowledge system is a unique theoretical medical framework rooted in thousands of years of Chinese civilization, and an integral component of fine traditional Chinese culture. Distinct from Western modern medicine founded on anatomical research, TCM integrates philosophical speculation, folk healthcare and medical ethics. Such multi-layered cultural attributes directly complicate its translation for international audiences.

First, philosophical concepts in TCM feature linguistic incommensurability. Core TCM doctrines originate from the theories of Yin-Yang and Five Elements as well as the harmony between humanity and nature, highlighting the dynamic balance between human bodies and the natural world alongside treatment based on syndrome differentiation (Bai et al., 2026). Core terms such as qi, blood, wind and dampness lack fully corresponding signifiers in Western linguistic systems. Literal translation easily distorts overseas audiences' cognition. For instance, the TCM pathogenic factor "wind pathogen" may be misinterpreted as natural wind in the physical sense.

Second, TCM contains diversified clinical expressions and intervention modalities. TCM covers multiple therapies including herbal medicine, acupuncture, tuina massage and qigong (life-energy cultivation practice). Its descriptions of disease mechanisms and therapeutic principles (e.g., soothing the liver and regulating qi, activating blood circulation to dissipate blood stasis) are highly condensed. These terms function both as medical jargon and heavily context-dependent culture-loaded words, requiring translators to possess both medical expertise and cross-cultural interpretative capabilities.

Third, Western audiences hold divergent perceptions of TCM wellness philosophies. TCM closely connects daily diet with disease prevention and treatment, embodied in concepts such as medicinal and edible homology and seasonal healthcare. The international communication of TCM culture is not merely one-way export of medical knowledge, but a cross-cultural dialogue on lifestyles. Translators must overcome pragmatic barriers to convert this unique wellness philosophy into universally accessible shared health wisdom.

3. Textual Characteristics and Communication Demands of Bilingual TCM WeChat Official Accounts

The integration of traditional TCM culture with new media represented by WeChat Official Accounts effectively reduces reading obstacles brought by obscure ancient medical texts. The TCM industry bears strong professional specificity. Translators engaged in TCM external publicity translation must master three core capabilities: linguistic and cultural conversion, medical professional identification and foreign language expression. They also need systematic command of TCM cultural conno-

tations, basic TCM theories and clinical practices. Centered on TCM cultural communication, translation work requires collaboration with industry specialists and academic scholars to accurately define the professional characteristics and communication positioning of TCM English translation (Yu et al., 2020). As long-form graphic contents, bilingual TCM WeChat Official Accounts exhibit distinctive traits that differentiate them from other external publicity texts:

3.1. Networked Text Structure and Demand for Logical Coherence

Articles published on official accounts are generally complete long-form popular science texts. Translation requires not only syntactic accuracy, but also consistent textual logic and unified terminology throughout the full passage. Sentence-by-sentence processing by LLMs alone tends to produce fragmented translations with ambiguous references and disjointed contexts.

3.2. Mixed Stylistic Registers and Demand for Hierarchical Translation

A single article often blends rigorous pharmacopoeia research, lyrical medical history narratives and accessible dietary therapy popular science. Different text genres impose disparate requirements on accuracy, aesthetic value and readability. Generic preset prompts cannot automatically adapt machine translation to all stylistic registers, which necessitates manual strategic intervention.

4. Theoretical Compatibility and Construction of the Human-AI Collaborative Translation (HACT) Model

Human-AI Collaborative Translation (HACT) refers to an innovative cooperative mode where human translators and intelligent systems such as LLMs interact dynamically to realize in-depth collaboration in translation generation, optimization and decision-making. “Its core feature lies in shifting optimization from single translation segments to full-process intelligent assistance, redefining translators’ roles from mechanical editors to senior decision-makers and quality controllers” (Liu & Zhang, 2025).

The HACT model demonstrates high theoretical compatibility for TCM official account external translation. On the one hand, it balances translation productivity and textual quality. Leveraging massive corpora, AI rapidly completes basic semantic conversion and processes large volumes of repetitive basic popular science content. On the other hand, it compensates for machines’ deficiencies in cross-cultural pragmatic competence and compliance awareness. Human translators can concentrate their energy on interpreting culture-loaded terms, restructuring logic in Chinese-style long sentences, and eliminating potentially illegal medical promotional language.

The open-source general large language model DeepSeek LLM is adopted to generate initial AI translations in this paper. Before translation, the WHO International Standard Bilingual Glossary of Traditional Chinese Medicine is imported as a fixed constraint glossary. The model is forced to adopt standardized transla-

tions from the glossary rather than literal translations during output.

Unified basic prompt template:

Task: English translation of popular science texts for bilingual TCM WeChat Official Accounts

Constraints:

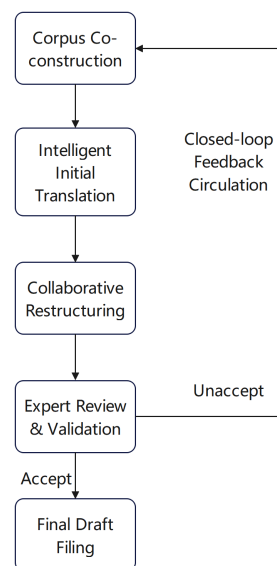
- 1) Strictly follow standardized terms from the WHO TCM glossary;
- 2) Avoid absolute medical claims such as “cure”, “radical treatment” and “significant curative effect”;
- 3) Adopt formal English popular science writing style and revise Chinese-style run-on sentences;
- 4) Add standardized explanations for unique TCM pathogenesis and health preservation concepts.

Targeting pain points in official account operation, this paper constructs a four-dimensional closed-loop workflow: Corpus Co-construction—Intelligent Initial Translation—Collaborative Restructuring—Expert Review & Validation.

1) Pre-translation Stage: Professional translators, together with licensed TCM practitioners, sort out high-frequency terms from WeChat Official Account articles, supplement them to the WHO terminology database, and generate a dedicated bilingual glossary for import into the model.

2) While-translation Stage: Input the full text of each official account article and load the fixed prompt template and terminology database. Intelligent Initial Translation + Collaborative Restructuring LLMs are deployed to generate batch translation drafts; Translators revise the translations against the four evaluation criteria. Human translators conduct hierarchical editing to resolve logical discontinuities, literal conceptual translation and cross-cultural cognitive gaps.

3) Post-translation Stage: Expert Review & Validation TCM professionals conduct final audits focusing on herbal compatibility and pathological mechanisms. Finalized texts are fed back into the database to enable continuous fine-tuning of the AI translation model, forming closed-loop feedback circulation.



5. Practical Approaches and Case Analysis of Human-AI Collaborative Translation

Typical corpus extracted from bilingual TCM culture WeChat Official Accounts is analyzed below across lexical, syntactic and pragmatic dimensions to elaborate the practical pathways of HACT strategies.

Corpus Sources, Screening Criteria and Sampling Rules

Sources of WeChat Official Accounts

Three official bilingual TCM WeChat Official Accounts in China that have run for more than three years and target overseas audiences are selected, namely China Traditional Chinese Medicine, Huayi Network and Journal of Traditional Chinese Medicine.

Screening Criteria

Text type: Popular science articles about solar term health preservation, medicinal and edible homology, and basic TCM theories;

Excluded contents: Clinical diagnosis and treatment, prescription drug advertisements, and pure activity notices;

Complete Chinese-English parallel texts without obvious literal machine translation traces, with a word count ranging from 300 to 800 words.

Sample Scale and Control Group Setup

A total of 15 articles are obtained through stratified random sampling as research corpus. The control group consists of pure machine translations generated solely by DeepSeek LLM for the same texts, while the experimental group refers to HACT collaborative translations revised by human translators.

Unified Four-Dimensional Evaluation Criteria (Applied Consistently to All Cases in This Paper)

Terminology Accuracy: Compliance with WHO international standard TCM terminology without literal mistranslation or conceptual confusion;

Logical Coherence: No comma splices or run-on sentences in English; clear causal and coordinate logic, and consistent textual references;

Cultural Adaptability: Supplementary cultural explanations for unique TCM concepts to eliminate comprehension barriers for overseas readers;

Compliance: Avoidance of absolute curative-effect expressions to meet the regulatory requirements of overseas medical publicity.

5.1. Lexical Level: Terminology Alignment and De-Exaggeration

When processing professional vocabulary, LLMs are limited by general monolingual corpus and prone to literal patchwork or failure to recognize exclusive TCM concepts. Human translators anchor such terms to international standard systems and remove absolute expressions liable to trigger regulatory disputes.

Source Text: 作为药食同源的典型代表，荷花全株皆可入药，兼具食疗与药用双重价值。

AI Initial Translation: As a typical representative of medicine and food from the same source, every parts of the lotus plant can be used as medicine, boasting

two values of food therapy and medicine use.

HACT Revised Translation: As a typical representative of medicinal and edible homology, every part of the lotus plant can be used medicinally, boasting dual therapeutic and dietary healthcare values.

Collaborative Analysis: The AI literally renders the core concept “药食同源” as medicine and food from the same source, lacking academic standardization. Human translators revise it to the WHO standard term medicinal and edible homology. Additionally, the AI repeatedly employs the noun medicine, overemphasizing curative effects and risking violation of overseas medical promotion regulations. The collaborative version rephrases the latter half as therapeutic and dietary healthcare to implement lexical de-exaggeration, weakening direct efficacy claims and ensuring compliant communication. Terminology Accuracy: The AI’s literal rendering of “medicine and food from the same source” fails to conform to international norms. Human translators replace it with the WHO standard term medicinal and edible homology to achieve consistent and standardized terminology.

Compliance: The AI repeatedly uses the word “medicine”, which may be deemed curative propaganda. Human revision switches it to “dietary healthcare” to downplay therapeutic connotations and avoid violations of overseas publicity regulations.

No obvious flaws are found in logical coherence and cultural adaptability, so no further adjustments are required.

5.2. Syntactic Level: Logical Restructuring and Coherence Improvement

Characterized by parataxis, Chinese TCM texts abound in short sentences and zero-subject clauses with implicit causal and coordinate relationships. AI translation typically follows the original word order, producing Chinglish run-on sentences. Human translators adopt hypotactic devices to reorganize internal logic.

Source Text: 大部分地区夏季高温潮湿，药材易生虫、受潮变质。下面为您介绍一些中药储存小窍门。

AI Initial Translation: Most areas have high temperature and humidity conditions in summer, medicinal materials are easy to moth infestation and deterioration from moisture. Here are some small tricks for you to proper storage of Chinese medicinal herbs.

HACT Revised Translation: High temperatures and humid conditions prevail in most regions during summer, making herbal medicines prone to moth infestation and deterioration from moisture. This article shares practical tips for proper storage of Chinese medicinal herbs.

Collaborative Analysis: The AI draft rigidly retains Chinese paratactic sentence structure, resulting in severe comma splice errors. Human translators identify the causal link between the two clauses and naturally connect them via the participial construction making.... Meanwhile, the colloquial, awkward phrase Here are some small tricks for you is replaced with This article shares..., matching the ob-

jective third-person tone of popular science articles and greatly boosting textual academic coherence and professionalism.

Logical Coherence: The AI translation contains comma splice grammatical errors. Human translators adopt participle structures to connect causal logic and fix the problem of run-on sentences.

Cultural Adaptability: The colloquial phrase “small tricks” is replaced with the objective formal expression “practical tips” to fit the stylistic norms of overseas popular science writing.

No obvious deviations exist in terminology and compliance, and the readability of the translation is greatly improved.

5.3. Pragmatic Level: Cultural Adaptation and Compliance Review

Numerous culturally unaligned concepts exist in TCM seasonal healthcare. Mechanical literal translation by AI often leads to failed cross-cultural communication, requiring human translators to adopt cultural adaptation strategies to compensate for semantic gaps.

Source Text: 小暑节气一到，气温攀升、湿气弥漫，这几种疾病多发：贪凉引发肠胃病、久吹空调患上空调病、暑热扰心出现失眠烦躁。

AI Initial Translation: As Minor Heat arrives, temperatures soar and humidity prevails, triggering a surge in several common ailments: gastrointestinal disorders from overindulging in cold food, air-conditioner sickness caused by prolonged exposure to air conditioning, as well as insomnia and irritability induced by summer heat disturbing the heart.

HACT Revised Translation: As Minor Heat arrives, temperatures soar and humidity prevails, triggering a surge in several common ailments: gastrointestinal disorders from excessive cold intake, air-conditioner sickness caused by prolonged exposure to air conditioning, as well as insomnia and emotional restlessness induced by summer-heat disturbing the heart.

Collaborative Analysis: Western daily diets naturally feature cold food, lacking the TCM cultural context where “overindulgence in cold food” leads to external cold pathogenic invasion. The AI’s literal rendering overindulging in cold food confuses overseas readers, so translators generalize it to excessive cold intake to lower cultural decoding barriers. Furthermore, translators hyphenate summer heat into summer-heat, transforming its literal meaning of high summer temperatures into the specific pathogenic factor in TCM’s six pathogenic influences theory, enabling accurate cross-cultural representation of core TCM concepts.

Cultural Adaptability: The phrase “overindulging in cold food” may cause cognitive confusion for Western readers, so it is revised to “excessive cold intake” in line with the TCM theory of cold pathogenic factors.

Terminology Accuracy: The hyphenated term “summer-heat” is adopted to specifically refer to the pathogenic factor among the six exogenous evils in TCM, distinguishing it from ordinary high summer temperatures.

There are no inappropriate expressions in terms of logical coherence and com-

pliance, enabling accurate cross-cultural transmission of TCM concepts.

5.4. Conclusion and Prospects

The widespread popularization of the Internet has delivered powerful carriers for disseminating and promoting TCM culture, simplifying and boosting the efficiency of TCM external publicity. TCM WeChat Official Accounts play a vital role in popularizing TCM news, spreading wellness information, promoting TCM preventive healthcare, communicating TCM culture and advocating preventive treatment of diseases (Chen et al., 2022). The ultimate goal of TCM cultural external publicity is to cross cultural barriers via audience-friendly communication carriers and foster global recognition and acceptance of China's wellness philosophy.

Qualitative analysis of three representative cases selected from the 15 sampled bilingual WeChat Official Account articles shows that Human-AI Collaborative Translation (HACT) boasts remarkable potential advantages when handling TCM new media texts featuring professional rigor, diverse cultural connotations and cross-border compliance requirements. This model integrates the batch translation capacity of AI with the cultural interpretation and risk control capabilities of human translators and professional experts. It is expected to ease the dilemma of balancing translation quality, output efficiency and compliance in the operation of bilingual official accounts, and holds practical potential to break cross-linguistic communication barriers of TCM, improve the professionalism of translations, boost translation efficiency and reduce the risks of violating overseas publicity regulations.

Nevertheless, the current HACT model still has limitations. Its collaborative efficiency heavily relies on the completeness of pre-established terminology banks, while the shortage of high-level interdisciplinary TCM translators restricts efficiency in the final review stage. Future research may focus on developing vertical LLMs dedicated to TCM new media and constructing specialized corpora, as well as refining standardized human-machine interactive prompts for segmented columns (e.g., clinical prescriptions, cultural allusions). Such efforts will facilitate standardized, high-quality and contemporary global outreach of TCM culture, comprehensively elevating national cultural soft power.

Conflicts of Interest

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

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