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A STUDY OF MECHANISM OF AI-EMPOWERED ADAPTIVE CROSS-CULTURAL NARRATIVE TEXT GENERATION: TAKING INTERNATIONAL COMMUNICATION OF EXCELLENT SPIRITUAL HERITAGE OF HEILONGJIANG AS AN EXAMPLE

In the context of cultural exchange and mutual learning, the global dissemination of cultural heritage has emerged as a critical theme. However, the challenges such as cultural barriers and narrative rigidity hinder its international reach. This study focuses on Heilongjiang’s excellent spiritual heritage as an example to explore how AI-empowered text generation can bridge these gaps in international communication. The research proposes a four-phase framework: cultural decoding, narrative reconstruction, human-AI collaboration, and effect verification. It is found out that AI-empowered cross-cultural narrative adaptation is conducive to optimizing intercultural communication. The author hopes that this study could provide theoretical and practical insights for the Belt and Road Initiative’s cultural exchanges and offer actionable models to serve the reform of foreign language education.

Keywords*: cross-cultural narrative, adaptability, text generation, artificial intelligence, excellent spiritual heritage of Heilongjiang*

In the context of advocating exchanges among civilizations and mutual learning, the international dissemination of excellent cultures has emerged as a significant contemporary theme. Research on international cultural communication

predominantly focuses on macro-level strategies, including studies on communication media, tactics, cultural security, etc. or case studies of related films and television productions, video games, local tourism, etc. However, probes into textual-level are underdeveloped, with investigations disproportionately concentrating on translation strategies while neglecting two crucial dimensions in text generation: cultural adaptation and the reconstruction of the narrative logic. This deficiency gives rise to practical challenges for intercultural communication, manifesting as cultural barriers, narrative rigidity, and diminished efficacy in text production. Consequently, it is urgent to research on developing narrative text generation mechanisms aligned with cross-cultural communication demands. In the meanwhile, the progressive advancement of artificial intelligence provides substantial digital-intelligent support for humanities-related research and practice. Composition transforms with the rise of the digital humanities (Koehler, 2017), and LLM presents technical potential and adaptability to enhance text production and analysis (Li, 2024) which may facilitate cross-cultural communication. Thereby, to tackle the challenges for international cultural promotion texts, this research constructs a four-phase mechanism encompassing "cultural decoding – narrative reconstruction – human-AI collaboration – effect verification" to explore cross-culturally adaptive narrative text generation assisted by AI, with that for Heilongjiang's spiritual heritage as an example.

1. Cultural Decoding

This phase establishes the foundational database for narrative generation through multidimensional resource integration, cultural symbol system construction and cross-cultural semantic annotation.

1.1 Multimodal Resource Integration

A repository is constructed to consolidate historical documents, audiovisual materials (e.g., The Great Northern Wilderness Pioneers documentary), and oral

histories (e.g., “Oral Histories of Veteran Reclamation Team Members”), providing AI systems with structured multimodal inputs to establish the knowledge base for subsequent analysis of cultural symbols.

1.2 Cultural Symbol System Construction

Artificial intelligence tools can be adopted to process the resources, and establish a three-tier symbol system of “material-behavior-spirit” for the excellent spiritual heritage. Material Symbols: e.g., Northeast China Martyrs’ Memorial Museum, Daqing oilfield drilling rig, Shangzhi Avenue, etc. Behavioral Symbols: e.g., Great Northern Wilderness reclamation labor scenarios, Wang Jinxi’s iconic “leaping into mud pits to suppress well blowouts”, etc. Spiritual Symbols: e.g., collectivism, pioneering ethos, value declarations like “Prefer twenty fewer years of life to secure national oil sovereignty”, etc.

1.3 Cross-Cultural Semantic Annotation

Dual-coding strategies are implemented to reconcile high-context Chinese symbols with low-context Western communication paradigms through the approaches as follows: 1) Semantic Mapping: Establish a mapping database in which cultural symbols are paired with corresponding western counterparts. e.g., Translating “Great Northern Wilderness Spirit” into “Pioneering Spirit” with explanatory notes on perseverance and innovation; 2) Cultural Transposition: Take into consideration the differences in cultural dimensions, and make adjustment in methods of presenting symbols. e.g.; 3) Recontextualizing collectivist narratives as “team-based excellence achievements” and transforming “hardship narratives” into “heroic breakthroughs against adversity”. This cultural adaptation is conducted in the light of Hofstede’s indication that individualism tends to prevail in developed and Western countries (2011).

2. Narrative Reconstruction

Readers' cognitive preferences and reception of different cultures must be taken into account in the analysis of the generation of narrative texts, which include familiar narrative modes, thought logic, and cognitive scripts and assist in enhancing target audiences' comprehension and identification with textual connotations. Therefore, narratives for cross-cultural communication require reconstruction based on these properties of the target audiences, which can be achieved through the approaches given below.

2.1 Transplanting Classical Literary Narrative Modes

Western literary traditions frequently employ travel narratives as dominant storytelling frameworks. Travel writing is both the documentation of physical journey and metaphysical explorations of spiritual realms. It constitutes a significant proportion of human cultural history (Tian, 2021). This narrative mode can be strategically adapted for cross-cultural texts. For instance, the Great Northern Wilderness Spirit could be reconceptualized through travel narratives, transforming geographical spaces into symbolic containers that bridge historical memory, regional symbols, and universal values. Campbell's "Hero's Journey model" (Campbell, 2008) can be adapted to be applicable to narratives like the Daqing Spirit. The Daqing Oilfield campaign could be reframed into a universal narrative arc: "Call to Duty (demands of energy of the nation) – Threshold Crossing (technological breakthrough) – Ultimate Ordeal (well blowout crisis) – Spiritual Return (perpetuation of the Iron Man Spirit)." Additionally, journalistic narrative models, such as the techno-historical storytelling approach of The Economist, offer transplantable frameworks for cross-cultural adaptation.

2.2 Designing Adaptation Schemes with Target Culture Research Trends

The narrative turn in Western historiographical theory reveals that neo-historical narratives (including traditional narratives) prioritize attention to individuals in history over groups or impersonal forces (Su, 2022: 73). This approach emphasizes

“the specific significance of individual actions within social contexts, the role of personal agency in generating behavioral meanings, and individuals’ intentional reconstruction of self-external environments through meaning-weaving, ultimately highlighting mutual shaping between individuals and environments” (Su, 2022: 74). Life History methodology focuses on revealing interactions between social structures, cultural practices, and historical transformations through micro-narratives of individual life trajectories. Life History not only documents events but also analyzes how individuals culturally contextualize experiences through narratives, as every person constitutes “a living carrier of cultural praxis.” Accordingly, cross-cultural narrative generation should transform China’s conventional linear historical narratives into Western-adapted personal life histories. For instance, “The Development History of the Great Northern Wilderness” can be reconfigured as “Three Generations of Reclamation Families: Choices and Perseverance.” The tripartite analytical framework of “Space-Memory-Body” proposed in Interdisciplinary Perspectives on Memory, Space, and Narrative in Anglo-American Literature can be directly applied to such narrative reconstruction (Cai et al, 2024).

2.3 Activating Emotional Resonance Through Target Culture Cognitive Scripts

Goddard and Wierzbicka refer to cultural scripts as a “powerful new technique for articulating cultural norms, values, and practices in terms which are clear, precise, and accessible to cultural insiders and to cultural outsiders alike” (2004: 153). In cross-cultural communication contexts, international promotion of exemplary spiritual cultures requires precise lexical triggers to activate audiences’ cognitive-emotional nodes. Aligning Western audiences’ value preferences with Heilongjiang’s cultural characteristics, a lexical trigger system can be constructed through these dimensions: 1) Symbolic Substitution. e.g., To replace collectivist expressions with individualized symbols like “individual endeavor of everyone”; to use “human-nature dialogue” instead of “conquering nature”; 2) Association

Generation. e.g., To introduce concepts like “black soil wisdom” and “cold zone innovation corridor” to bind technological innovation with pragmatism; to employ terms such as “Ecological Bank” and “carbon neutral pioneer province” to integrate environmental protection with community responsibility; 3) Genre-Specific Storytelling Archetypes Adoption. e.g., “Heroic Growth” for the transformation from farmers to revolutionaries; “Familial Legacy” for occupational inheritance across three generations of oil workers; “Technological Breakthrough” for world drilling record achievements by the 1205 Drilling Team; “Ecological Restoration” for sustainable development narratives of the Great Northern Wilderness wetlands; “Urban Metamorphosis” for Harbin’s evolution from a Trans-Eurasian Railway hub to a winter cultural capital; “Artistic Synergy” for ecological governance stories of Daqing oilfield told through Silent Spring-inspired scientific narratives.

3. Human-AI Collaborative Text Generation

To balance cross-cultural communication accuracy with narrative innovation and achieve deep integration between technological tools and humanistic expertise, in this phase, an effective Human-AI collaborative content production loop is conducted: design of structured prompt templates, implementation of dynamic style transfer via AI, and human validation with the tiers of linguistic, cultural, and aesthetic aspects. The workflow for generating international communication texts is presented as follows with that of “Great Northern Wilderness Spirit” as the example.

Step 1: Structured Prompt Design (Human Operation)

Human operators construct structured prompt templates containing three core elements: [Time/Location/Protagonist] + [Cultural Keywords] + [Narrative Template]. Temporal, spatial, and character parameters are extracted from the cultural symbol database established in Phase I. Narrative templates are configured by referencing literary paradigms and cognitive scripts analyzed in Phase II. For generating short stories about the Great Northern Wilderness Spirit, a sample template is structured as follows: [Time] 1950s-1980s. [Location] Sanjiang Plain,

Heilongjiang Province, China. [Protagonist] Reclamation Team Member Li Minghua. [Cultural Keywords] Pioneering Spirit, Black Soil Conservation, Cold-Region Agriculture. [Narrative Template] Individual Struggle + Technological Innovation + Ecological Awareness Awakening. For implementation on AI platform, more specifications can be inserted, such as [Core Conflict] Tension between traditional farming and mechanization transition; [Cultural Metaphor] Transforming "demanding grain from wasteland" into technological ethics discourse, etc.

Step 2: Style Transfer Instructions (AI Processing)

The AI system executes dynamic style migration based on predefined stylistic commands. For instance, a target style instruction such as "Adopt the exploratory documentary style of National Geographic" can be appended to the structured prompt template in Step 1. Further refinement may include: 1) New Yorker Feature Style: Enhance psychological character depictions and embed historical context metaphors through literary enhancement requests; 2) Reuters News Style: Implement inverted pyramid structure with data emphasis by adding instructions like "Include 1958 land reclamation acreage statistics"; 3) TED Talk Style: Construct suspense-driven openings and amplify emotional arcs through directives such as "Begin with 'When Tractors Met Permafrost'", etc.

Step 3: Human Validation & Tripartite Filtering

Following initial draft generation, human validators conduct factual accuracy checks to identify chronological inconsistencies or causal fallacies, prioritizing the correction of cultural misinterpretations and logical discontinuities. A three-tier validation protocol is implemented: 1) Linguistic Layer: Eliminate Sinicized English expressions through lexical substitutions, exemplified by replacing "spiritual civilization" with "shared values"; 2) Cultural Layer: Mitigate culturally sensitive metaphors via semantic realignment: e.g., "War" revised as "Historical Memory"; "Sacrifice" revised as "Spirit of Dedication"; "collective wisdom" revised as "team innovation", etc.; 3) Aesthetic Layer: Modulate rhetorical density through stylistic adjustments, such as reducing parallel sentence structures while augmenting

depiction of scenes.

4. Effect Verification

Cross-cultural adaptability of generated and human-validated texts can be verified through the methods described below.

4.1 Evaluation Conducted by Artificial Intelligence

Tools for sentiment analysis, such as the LIWC can assess textual features including positive tone, negative tone, cognitive processes, clout, and authenticity. Different versions of AI-generated texts can be compared assisted by it, which enables selection of the optimal text. For instance, LIWC is adopted in the analysis of Great Northern Wilderness reclamation narratives generated by ChatGPT and Claude under identical prompts. The comparative study reveals distinct patterns: ChatGPT outputs demonstrates above-average negative tone, while Claude-generated texts are of above-average positive tone and moralization. The result indicates Claude's superior suitability for disseminating excellent spiritual cultures. Additionally, verification can be conducted by tools like ChatGPT and Deepseek to automatically detect cultural conflicts and narrative coherence in generated texts.

4.2 Human Validation

Interviews and questionnaires can be employed to evaluate textual performance across four dimensions: cognitive acceptance, cultural misinterpretations, emotional resonance, and narrative pattern perception. A controlled comparison protocol involves three text groups: Group A: Conventional human-translated texts. Group B: AI-generated texts without cultural adaptation prompts. Group C: Culturally adapted AI-generated texts with human optimization. Refinements can be conducted based on evaluative feedback from these comparisons.

4.3 Dynamic System Optimization

Quantitative data from AI evaluation and qualitative insights from human validation serve for updating to cultural symbol databases, narrative pattern libraries, emotional trigger anchors, prompt engineering strategies. This adaptive mechanism ensures continuous improvement of cross-cultural text generation through cyclical optimization.

5. Conclusion

In this study, a systematic "cultural decoding – narrative reconstruction – human-AI collaboration – effect verification" framework for cross-cultural narrative generation has been established, taking Heilongjiang's spiritual heritage as a demonstrative case. This framework introduces an adaptive perspective to cross-cultural communication theory, harmonizing technological empowerment with humanistic calibration. By addressing persistent challenges like narrative rigidity, cultural discounting, and communication inefficiency in international cultural dissemination, it offers an innovative pathway for AI-enhanced text generation. The author hopes that this study could provide theoretical and practical insights for the Belt and Road Initiative's cultural exchanges and offer actionable models to serve the reform of foreign language education.

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人工智能赋能的跨文化叙事适配文本生成机制研究

——以黑龙江优秀精神文化对外宣传为例

在倡导文化交流互鉴的时代背景之下，优秀文化国际传播是当今的一大主题，但其全球传播仍面临文化隔阂与叙事僵化等挑战。本研究以黑龙江优秀精神文化为例，探讨人工智能驱动的文本生成技术如何应对相关挑战，促进优秀文化的国际传播。研究提出包含文化解码、叙事重构、人机协作与效果验证的四阶段框架。研究发现人工智能赋能跨文化叙事适配文本的生成有助于优化跨文化交流。希望本研究为“一带一路”人文交流提供理论与实践参考，并为外语教育改革提供一定借鉴。

关键词：*跨文化叙事，适配，文本生成，人工智能，黑龙江优秀精神文化*