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# Human-AI Comparative Study on English Translation of Culture-Loaded Terms at Nanjing Museum from the Skopos Theory Perspective

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**Abstract:** Based on Skopos Theory, this study compares human and AI English translations of Nanjing Museum’s culture-loaded terms. AI performs well in information and readability; human translations offer higher loyalty. It is recommended to build a terminology database, combine AI pre-translation with human post-editing, and evaluate by audience.

**Keywords:** Skopos Theory; culture-loaded terms; comparison; translation strategy optimization

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## 1. Introduction

As one of China’s three major museums, the Nanjing Museum boasts extensive collections and profound cultural significance. Its descriptions frequently feature culturally loaded terms like “鼎 (dǐng)”, “釉里红 (yòu lǐ hóng)” and “士大夫 (shì dà fū)”. These words embody core elements of Chinese civilization yet pose translation challenges due to cultural differences.

Building upon existing research, the academic community has already directed attention toward museum translation. For instance, Li Qian Yao identified four categories of translation issues and proposed improvement suggestions<sup>[1]</sup>; Xiao Yiwen analyzed bilingual museum introductions to highlight translation inadequacies and summarized culturally relevant translation strategies<sup>[2]</sup>; Ma Junjie emphasizes that translation must balance informational accuracy with functional adaptation to the target cultural context<sup>[3]</sup>. However, existing research has room for improvement in two areas: first, it often relies on single corpora, lacking systematic human-machine comparative analysis; second, while discussions on translating cultural terms involve cognitive strategies, human-machine comparative studies grounded in translation purpose remain insufficient. To address this, this paper introduces artificial intelligence translation as a new variable, constructing a “human-machine” comparative framework.

## 2. Related concepts

In the field of translating cultural terms into English, teleology offers a more explanatory and operational supplement to

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traditional translation studies centered on linguistic equivalence. Its core principle is the “Skopos,” shifting the evaluation criteria toward the anticipated effect of the translation on the target audience<sup>[4]</sup>. Under this overarching framework, the “coherence principle” demands that the translation be understandable, coherent, and acceptable within the target language context, prioritizing the reader’s smooth acquisition of information<sup>[5]</sup>. Meanwhile, the “loyalty principle” emphasizes interlingual consistency between the source and target texts and the accurate transmission of the author’s intent, preventing the loss of key cultural connotations. These three principles are not mutually exclusive: the Skopos establishes the overall direction and logic of selection, the coherence principle ensures readability and acceptability at the audience level, and the loyalty principle upholds fundamental respect for the original text’s information and intent. Their synergy provides clear evaluation criteria and practical guidance for human-machine comparative studies on the English translation of cultural terms from the Nanjing Museum.

### 3. Research design

This study adopts a comparative design to systematically contrast human translations with those produced by DeepSeek for culture-loaded terminology from the Nanjing Museum, ensuring traceable procedures and verifiable findings. The corpus derives exclusively from official sources: on-site photographs of physical label texts collected on April 2, 2025, together with contemporaneous online exhibit descriptions from the museum’s website and WeChat mini-program. Each sample contains at least one term or concept with distinct Chinese cultural characteristics. Official English labels and online descriptions serve as the human-translation benchmark, representing professionally vetted museum renderings. AI outputs were generated by submitting the same Chinese source texts to DeepSeek-V3 (May 2025) without custom termbases or contextual prompts, to assess baseline capability. For consistency, each source text was isolated from its original context and entered as an independent translation unit; no auxiliary background information was provided, thereby foregrounding the handling of cultural terms and clarifying human-machine differences. Samples were categorized by semantic connotation into three groups: institutional hierarchy, spiritual culture, and temporal geographical.

## 4. Comparative analysis of human-machine translation for cultural terminology

### 4.1. Human-machine comparison of cultural terms in institutional hierarchy

Compared to terms describing artifact craftsmanship, hierarchical expressions associated with institutions and rituals exhibit greater abstraction and cultural specificity. Their semantic focus often lies not in tangible materiality, but in the conceptual representation of value systems and social structures. Translating such terms into English requires grounding in cultural context, prioritizing complete conceptual representation and academic accuracy in terminology. Simultaneously, appropriate paraphrasing and expression adaptation ensure target readers swiftly grasp core meanings within limited attention spans.

Take “别贵贱，序尊卑 (bié guì jiàn , xù zūn bēi)” as an example: human translation renders it as “Distinguish the rich and poor, ordering the superior and inferior (hierarchical concept)”; machine translation renders it as “Distinguish between the noble and humble, and to establish a hierarchy of the esteemed and the lowly.” The two approaches exhibit significant differences in strategy and focus. The human translation avoids literal word-for-word correspondence. Instead, it distills the action logic through verbalized expressions like “distinguishing” and “ordering,” while explicitly highlighting the core concept with the parenthetical note “hierarchical concept.” This aims to lower the comprehension threshold, helping readers swiftly grasp the theme of “hierarchical order.” This approach demonstrates clear advantages in terms of purpose and coherence: on one hand, within the museum guide context where readers have limited time, explicit conceptual cues facilitate rapid communication goals; on the other, the combination of verbalization and bracketing shortens the inferential path within the text, enhancing intratextual coherence. However, from a loyalty perspective, the

human translation's "rich and poor" leans toward economic attributes, potentially weakening the traditional connotations of "noble and lowly" as indicators of social status and ritual hierarchy, thereby carrying a risk of cultural displacement.

The machine translation adopts a more literal approach aligned with the source text's rhetoric and parallel structure, using "noble and humble" and "esteemed and the lowly" to recreate the value axis of hierarchical opposition. It further clarifies the institutional meaning of "order" through "establish a hierarchy". This translation demonstrates strong loyalty: it preserves the rhetorical parallelism while translating the social identity connotations of "noble/base, esteemed/lowly" into more appropriate terms, facilitating accurate cultural semantic restoration. However, its expression is rather formal and elegant, requiring readers to independently extract and synthesize the implied concept of "hierarchical order." This creates a higher comprehension threshold in a guided tour context, with coherence and goal attainment falling short of the direct clarity achieved by human translation.

#### 4.2. Human-machine comparison of cultural terms in spiritual culture

Compared to terms related to artifacts and institutions, those pertaining to spiritual culture are more abstract and aesthetically oriented. They often convey profound spiritual connotations—such as philosophical speculation, ethical values, and aesthetic traditions—through highly condensed expressions, forming evaluative and normative cultural discourses. For instance, phrases like “清新浑朴 (qīng xīn hún pǔ),” or “物以载道 (wù yǐ zài dào),” serve both as aesthetic judgments and value stances. Achieving information equivalence through one-to-one correspondence proves challenging during cross-linguistic translation of such terms. Chinese characters or phrases often embody compound meanings and rhetorical tension, whereas English tends to unfold interpretations through clear logical structures and conceptual labels.

Take the phrase “富丽而不失优雅，工巧而不失大方 (fù lì ér bù shī yōu yǎ , gōng qiǎo ér bù shī dà fang),” as an example. The human translation renders it as “luxurious and elegant, sophisticated and decent,” while the machine translation offers “Magnificent yet elegant, exquisite yet dignified.” Both translations convey the core information: presenting a “balance within tension” through two sets of parallel adjectives—luxury harmonizing with elegance, and sophistication coexisting with grace. However, examining their higher-level functions through the teleological “purpose-coherence-loyalty” triad reveals shortcomings. First, regarding Skopos: the original sentence transcends mere object description to embody an aesthetic stance and evaluative approach, emphasizing mastery and harmony within opposing dimensions. The existing translation replaces these with common quality descriptors, which facilitates quick comprehension but fails to make the “dialectical aesthetic balance” explicit to the target audience, thereby limiting its ability to evoke stronger cultural and aesthetic resonance. Second, regarding the principle of coherence, target-language readers are accustomed to interpreting abstract judgments through argumentative or structured expressions. Merely stacking adjectives risks appearing generalized and vague, lacking guiding semantic anchors that weaken the text's persuasiveness in an English context. Third, regarding loyalty to the original: the Chinese text employs parallel structures and the contrasting phrase “while retaining” to create rhythmic balance and aesthetic equilibrium, implicitly conveying the Confucian concept of moderation. A literal translation into parallel adjectival pairs preserves the juxtaposition of opposites but sacrifices the rhetorical cadence, sense of proportion, and intellectual tension.

#### 4.3. Human-machine comparison of cultural terms in spatiotemporal geography

Spatiotemporal Geography cultural terms combine regional specificity with temporal affiliation, often involving niche and specialized knowledge points such as archaeological chronology, burial system forms, and alternative place names. “黄杨题凑 (huáng yáng tí còu),” exemplifies this category, referring to burial structure and material characteristics. The museum's human translation rendered it as “vertical earth pit tombs with wooden structure (Note: ‘Huangpi Titang’ appears to be a typo or variant; standard term is vertical earth pit tombs with wooden structure),” while the machine translation produced “Huangyang Ticou (outer coffin wall made of catalpa wood sections)”. The two translations exhibit comparable differences in strategic orientation and information organization.

From a purpose-driven perspective, the human translation first summarizes the core concept using a structurally clear description in the target language—namely, the fundamental typological features of “vertical earth pit tombs with wooden structure” (vertical excavation, earth pit tomb, wooden coffin placement). It then notes in parentheses the potential typo or variant in the original text while specifying the standard terminology. This “interpretation-first, correction-second, standardization-last” approach effectively minimizes reader comprehension costs: even non-specialist audiences can first grasp the “tomb structure” intuitively, then access standardized terminology in the annotation. The cognitive gradient aligns with the original text’s intent, avoiding translation-induced barriers. In contrast, machine translation employs the transliteration “Huangyang Ticou,” with a footnote summarizing that “the outer coffin walls are composed of segments of boxwood (or possibly interpreted as zelkova/ catalpa, etc.).” While this approach provides contextual clues for specialists, it hinders immediate comprehension for general readers: The transliteration lacks semantic support within the text, forcing readers to rely on annotations to infer its meaning as a “tomb structural element,” thereby increasing cognitive load during initial recognition<sup>[6]</sup>.

Regarding coherence, English readers possess established semantic frameworks for expressions like “vertical earth pit tombs” and “wooden structure/coffin chamber.” Consequently, the core descriptions in the human translation exhibit strong discursive coherence. Simultaneously, the “standard terminology note” and “transcription correction” in the annotation establish a causal-explanatory relationship with the main text, creating a clear reading path. Machine translation’s “phonetic transcription + material feature bracketed note” presents a juxtaposed relationship in the discourse, lacking explicit framing cues. Non-specialist readers find it difficult to integrate this into the knowledge chain of “tomb type—structural component—material property,” resulting in weaker coherence.

Regarding loyalty principles: The human translation faithfully presents the structural essentials of the tomb form through the standardized English term “vertical pit wooden coffin tomb,” while academically correcting potential original errors via annotations. This preserves information accuracy and upholds the translator’s dual loyalty to both the original author and the reader. While machine translation offers factual accuracy in material details like “segmented outer coffin walls,” if the original term is indeed a miswriting or non-standard terminology, transliteration risks “over-compliance” with formal loyalty, undermining the concept’s academic rigor. Furthermore, if “Huangyang” is misinterpreted as ‘boxwood’ or confused with the “Huangpi / Huangyang / Zizyphus” category, it carries inherent risks of species-material ambiguity requiring further scholarly investigation.

## 5. Conclusion

Within a Skopos-oriented framework, this study compares human and AI English renditions of Nanjing Museum culture-loaded terms across four categories. In hierarchies, AI more faithfully renders identity semantics and parallel rhetoric, though at a higher comprehension threshold; human translation reduces cognitive load via verbalization and conceptual glossing, yet should not recast identity hierarchy as economic opposition. In spiritual culture, adjective stacking fails to convey the aesthetic principle of degree/balance; effective rendering requires concept explicitation, logical reconstruction, and calibrated parallelism. In spatiotemporal geography, human translation’s definition–term calibration–variant-name annotation proves more robust, whereas AI transliterations and detail prompts require post-editing.

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## Disclosure statement

The author declares no conflict of interest.

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