Emotional Semantic Decoding and Promotion Strategies of Brand Reputation from the Perspective of Multilingual Communication: An Empirical Study Based on Convergent Media Big Data

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Abstract: Brand reputation, as a core intangible asset for brands, faces challenges of "semantic distortion" and "emotional dislocation" in multilingual communication under the convergent media context. To address this issue, this study constructs a four-stage emotional semantic decoding framework of "data collection - word segmentation - semantic extraction - difference analysis" by integrating the BERT-BiLSTM-GRU model and cross-cultural communication theory. Empirical research is conducted using convergent media big data from three languages (Chinese, English, Thai) across platforms such as Weibo, YouTube, and LINE Today Thailand. The results reveal three key findings: first, there are significant dimensional differences in brand emotional expression across languages-Chinese focuses on social value (responsibility, credibility), English on economic value (innovation, competitiveness), and Thai on experience value (user experience); second, the core causes of cross-linguistic emotional semantic deviation are cultural context differences (42.3%), professional term translation errors (31.7%), and emotional expression habit differences (26.0%); third, a three-in-one strategy of "language adaptation - emotional resonance - scenario-specific" can effectively reduce emotional deviation and enhance brand reputation, which is verified by quasi-experiments. This study provides a technical framework and practical strategies for brand reputation management in multilingual communication scenarios.

Keywords: Multilingual Communication; Brand Reputation; Emotional Semantic Decoding; BERT-BiLSTM-GRU Model; Cross-Cultural Adaptation; Convergent Media Big Data

1. Introduction

1.1 Research Background

Brand reputation refers to the positive emotional tendencies and word-of-mouth evaluations formed by stakeholders based on brand communication and experience, which is a core intangible asset for the long-term development of brands [1]. With the deep integration of economic globalization and convergent media technology, brand communication has broken through the boundaries of a single language, spreading globally through multi-platforms such as YouTube, Weibo, and LINE Thailand in multiple languages including Chinese, English, and Thai. However, language differences and cultural context gaps easily lead to "semantic distortion" and "emotional dislocation" in the communication of brand emotional information: for example, the positive emotional expression of responsible in Chinese may be misinterpreted as "conservative" in English due to improper translation; the euphemistic criticism of "service details" in Thai may be misjudged as neutral by traditional evaluation methods [2].

Existing studies mostly focus on the influencing factors of reputation in single-language scenarios. For instance, research has explored the positive effect of corporate social responsibility on reputation, but ignored the differences in multilingual emotional semantics; studies on cross-linguistic sentiment analysis have made progress (e.g., breakthroughs in natural language processing in the era of large models have been discussed), but failed to combine specific scenarios of brand communication; strategies for improving reputation are mostly general suggestions, without considering the emotional expression rules of different languages. Therefore, decoding the emotional semantics of brands in multilingual communication, revealing the laws of differences, and proposing targeted promotion strategies have become important

topics in brand communication research in the convergent media era [3].

1.2 Literature Review

1.2.1 Research on influencing factors of brand reputation

The influencing factors of brand reputation have expanded from a single dimension to multiple dimensions. Early studies focused on product quality and service experience: for example, Fan proposed that customer experience is the core of service brand reputation formation [4]; later studies incorporated factors such as corporate social responsibility and brand communication. Liu et al. empirically verified that corporate social responsibility performance can significantly improve brand reputation [1]; Su et al. pointed out from the perspective of emotional marketing that brand emotional resonance is a key path to enhance reputation [5]. However, existing studies are mostly limited to single-language and single-culture scenarios, and do not involve the adaptation of emotional semantics in multilingual communication.

1.2.2 Research on multilingual sentiment analysis technology

The core challenge of multilingual sentiment analysis lies in semantic alignment and low-resource language adaptation. Ma et al. reviewed the application of big data and deep learning in sentiment analysis, pointing out that cross-linguistic semantic deviation is the main technical bottleneck [6]; Xia et al. used natural language processing technology to analyze social media texts of luxury brands, but the accuracy of cross-linguistic sentiment classification was only 78.3% [7]; Li et al. applied the BERT model to Chinese sentiment analysis with an accuracy of 89.7%, but performed poorly in low-resource languages (e.g., Thai) [8]. The recently emerging BERT-BiLSTM-GRU model has shown advantages in multilingual word segmentation through multi-module integration. For example, Kim et al. (2024) applied it to emotional decoding of local media, increasing the accuracy to 92.5%, but it has not been systematically applied to brand reputation research [9].

1.2.3 Research on cross-cultural brand communication

Cross-cultural brand communication research focuses on the impact of cultural differences on communication effects. Hall proposed the high-context and low-context cultural theory, pointing out that there are significant differences in emotional expression habits across cultures [10]; Hofstede's cultural dimension theory provides a theoretical basis for formulating cross-cultural communication strategies [11]; Yang et al. empirically studied the cross-cultural interaction effect of brand Weibo, but did not involve multilingual emotional semantic decoding [12]; Liao et al. explored the public opinion guidance mechanism of brand public welfare marketing based on Hongxing Erke's Weibo big data, but did not expand to multilingual scenarios [13]; Carlson (2023) studied the impact of native advertising on journalism, providing new ideas for language adaptation in brand communication [14].

1.3 Definition of Core Concepts

1.3.1 Brand reputation

It refers to the positive emotional tendencies, word-of-mouth evaluations, and emotional identification formed by stakeholders based on brand communication content and actual experience. As the core embodiment of brand emotional value, it has the characteristics of subjectivity, cross-cultural difference, and dynamics.

1.3.2 Emotional semantic decoding

It refers to extracting emotional words, emotional intensity, and emotional dimensions from multilingual texts through natural language processing technology, restoring the real emotional tendencies in brand communication, and breaking the cross-linguistic emotional semantic barrier.

1.3.3 BERT-BiLSTM-GRU multilingual word segmentation model

It uses the BERT pre-trained model to capture contextual semantic associations, combines BiLSTM bidirectional encoding to strengthen context-dependent recognition, and optimizes the processing efficiency of low-resource languages through GRU decoding, realizing accurate word segmentation and emotional word extraction of multilingual texts.

2. Construction of Emotional Semantic Decoding Framework for Multilingual Brand Reputation

2.1 Theoretical Basis and Research Hypotheses

2.1.1 Theoretical basis

Affective Computing Theory: Proposed by

Picard, its core is to extract and analyze emotional information in texts through computer technology, providing technical theoretical support for multilingual emotional semantic extraction [15];

Cross-Cultural Communication Theory: The high-context and low-context cultural theory and the cultural dimension theory provide a cultural theoretical basis for explaining multilingual emotional semantic differences.

Brand Emotional Theory: It emphasizes that brand emotion is the core of reputation formation, and emotional resonance can significantly enhance brand identification.

2.1.2 Research hypotheses

Based on the theoretical basis, three research hypotheses are proposed:H1: There are dimensional differences in brand emotional expression across languages—Chinese focuses on social value dimensions (responsibility, credibility), English focuses on economic value dimensions (innovation, competitiveness), and Thai focuses on experience value dimensions (user experience);H2: Cross-linguistic emotional semantic deviation mainly stems from cultural context differences, professional term translation errors, and emotional expression habit differences, among which cultural context differences have the most significant impact;H3: Cross-linguistic emotional deviation can be effectively reduced and brand reputation enhanced through language adaptation, emotional resonance, and scenario-specific strategies.

2.2 Decoding Framework and Technical Path

A four-stage emotional semantic decoding framework of "data collection - word segmentation - semantic extraction - difference analysis" is constructed, with the specific technical path as follows:

2.2.1 Data collection and preprocessing

Python crawler technology is used to crawl brand communication texts from three major platforms-YouTube (mainly English), Weibo (mainly Chinese), and LINE Today Thailand (mainly Thai)-based on Selenium and Scrapy frameworks. The research objects include 5 multinational enterprises such as State Grid and Huawei; the search keywords include multilingual combinations such as State Grid and "สแตตกริด (State Grid in Thai)", with a time span from January 2021 to December 2023. A total of 12,000 original data entries were collected, and after deduplication (using URL as the unique identifier), noise filtering (removing advertisements and irrelevant comments), and manual annotation (emotional tendency and dimensions), 8,000 valid samples were finally obtained (3,000 in Chinese, 3,000 in English, and 2,000 in Thai).

2.2.2 Multilingual word segmentation

The BERT-BiLSTM-GRU model is used for word segmentation:

BERT pre-training layer: Pre-trained based on the Wikipedia corpus of 104 languages to capture multilingual contextual semantic associations and solve the problem of polysemy;

BiLSTM encoding layer: A bidirectional long short-term memory network processes both forward and reverse text sequences simultaneously to strengthen the context-dependent recognition of emotional words;

GRU decoding layer: A gated recurrent unit simplifies the network structure, improves the processing efficiency of low-resource languages (Thai), and reduces overfitting risks.

Experiments show that the accuracy of this model in Chinese, English, and Thai is 92.5%, 93.1%, and 90.2% respectively, which is 4.3%-6.1% higher than the traditional mBERT model [9].

2.2.3 Emotional semantic extraction

Emotional dimension extraction: Based on the characteristics of brand communication, six emotional dimensions-"responsibility", "credibility", "innovation", "competitiveness", "user experience", and "public opinion guidance"-are preset. The core emotional words of each dimension are extracted through the cross-linguistic adversarial transfer learning module;

Emotional intensity quantification: A combination of emotional dictionaries and machine learning is used to classify emotional intensity into 5 levels (1=extremely negative, 3=neutral, 5=extremely positive) to quantify the emotional tendency of texts in different languages.

Semantic alignment: A multilingual emotional word alignment dictionary for Chinese, English, and Thai is constructed. For example, responsibility corresponds to "social commitment" in English and "ความรับผิดชอบสังคม (social responsibility)" in Thai to solve cross-linguistic semantic deviation [2].

2.2.4 Difference analysis

The proportion of texts in different languages

across the six emotional dimensions is counted, the selection of emotional words, directness of expression, and intensity characteristics are compared, and the influence weights of cultural context, translation errors, and expression habits on emotional semantic deviation are quantified through regression analysis.

3. Empirical Analysis of Emotional Semantic Differences in Multilingual Brand Reputation

3.1 Basic Characteristics of Samples
Among the 8,000 valid samples, there are 3,000 Chinese samples (2,800 from Weibo, 200 from other Chinese platforms), 3,000 English samples (2,700 from YouTube, 300 from other English platforms), and 2,000 Thai samples (1,800 from LINE Today, 200 from other Thai platforms); the emotional tendency distribution is 4,200 positive samples (52.5%), 2,100 neutral samples (26.25%), and 1,700 negative samples (21.25%). The sample distribution is balanced, meeting the requirements of empirical research.

3.2 Verification of Emotional Dimension Distribution Differences (H1 Verification)
3.2.1 Chinese texts
Emotional expression is concentrated in the "responsibility" (32.7%) and "credibility" (28.5%) dimensions, accounting for a total of 61.2%. High-frequency positive words include responsible, reliable, transparent, andpublic welfare, while negative words mainly involve delayed service and non-transparent information. This is closely related to the emphasis on brand social value in the collectivist culture of the Chinese context, reflecting the high attention of domestic audiences to corporate social responsibility [1].
3.2.2 English texts
The "innovation" (35.2%) and "competitiveness" (30.1%) dimensions have the highest proportion of emotional expression, totaling 65.3%. Positive words include "innovative", "competitive", and "technological breakthrough", while negative words are concentrated in "outdated" and "uncompetitive". This reflects the focus on brand market performance and technological innovation in the individualistic culture of the English communication context [11].
3.2.3 Thai texts
The "user experience" dimension accounts for 38.6% of emotional expression, significantly higher than other dimensions. Positive words include "สะดวก (convenient)" and "ดีเยี่ยม (high-quality)", while negative words mainly involve "ช้าลง (slow)" and "ไม่สะดวก (inconvenient)". Thai audiences are more sensitive to feedback on service details and user experience, and their emotional expression is more delicate and euphemistic, which is in line with the emphasis on interpersonal harmony in Thai culture [10].
The empirical results support H1: There are significant dimensional differences in brand emotional expression across languages-Chinese focuses on social value, English on economic value, and Thai on experience value.

3.3 Analysis of Causes of Cross-Linguistic Emotional Semantic Deviation (H2 Verification)
The influence weights of various factors on emotional semantic deviation are quantified through regression analysis, and the results show: Cultural context differences: With an influence weight of 42.3%, it is the core cause. In Chinese high-context culture, emotional expression depends on context—for example, the emotional connotation of patriotism cannot be fully conveyed in English; in English low-context culture, emotional expression is direct and clear, and it is easy to misjudge the euphemistic positive expression in Chinese as neutral [10,11]. Professional term translation errors: With an influence weight of 31.7%. Translating responsibility as "responsibility" has a neutral tone in English; after changing it to "social commitment", the accuracy of positive emotion recognition increases by 28.5%; the literal translation of smart grid in Thai is easily misunderstood as "technically complex"; after contextual translation as "โครงข่ายไฟฟ้าสะดวกและปลอดภัย (convenient and safe power grid)", negative associations decrease by 32.1% [2].
Emotional expression habit differences: With an influence weight of 26.0%. Emotional expression in Chinese is direct and clear, emotional words in English are more intense, and emotional expression in Thai mostly relies on modal particles (e.g., "นะ", "ค่ะ"). Traditional analysis methods based on word intensity tend to misjudge its emotional tendency [6].
The empirical results support H2: The core causes of cross-linguistic emotional semantic deviation include cultural context differences,

professional term translation errors, and emotional expression habit differences.

4. Strategies for Enhancing Brand Reputation in Multilingual Communication (H3 Verification)

Based on the empirical analysis results, a three-in-one reputation enhancement strategy of "language adaptation - emotional resonance - scenario-specific" is proposed. Through quasi-experimental verification (selecting State Grid's Thai market to apply the strategy, and the reputation increased by 18.7% after 3 months), the effectiveness of the strategy is proved (H3 is verified).

4.1 Language Adaptation Strategy: Accurately Matching Emotional Expression Habits of Languages

4.1.1 Vocabulary adaptation

Optimize vocabulary selection according to the emotional dimension preferences of different languages: Chinese communication strengthens expressions related to "social responsibility" and "credibility", such as highlighting the brand's environmental protection initiatives and public welfare contributions; English communication focuses on words such as "innovation" and "technological breakthrough"; Thai communication uses more daily words, such as "สะดวกใช้ (easy to use)" and "บริการทันใจ (timely service)", avoiding the accumulation of professional terms [14].

4.1.2 Translation optimization

Establish a multilingual standardized translation database for core brand words. Examples of core word translations are as follows (table 1):

Table 1. Examples of Core Word Translations

Core Chinese Word	Optimized English Translation	Optimized Thai Translation
Responsibility	Social commitment	ความรับผิดชอบสังคม
Smart Grid	Smart and efficient power grid	โครงข่ายไฟฟ้าสะดวกและปลอดภัย

4.1.3 Expression habit adaptation

Chinese communication maintains a direct and clear emotional expression style, appropriately using culturally loaded words such as patriotism; English communication strengthens the intensity of emotional words; Thai communication adopts a euphemistic and kind expression style, using more modal particles and contextual descriptions [10].

4.2 Emotional Resonance Strategy: Stimulating Emotional Identification Based on Cultural Context

4.2.1 Chinese context

Strengthen the expression of the brand's social value, release cases of the brand's emergency support in natural disasters and public welfare donation achievements, and use narrative frameworks such as "national brand" and "responsibility" to align with the patriotic feelings of Chinese audiences [1]; produce a Chinese version of the corporate social responsibility report, highlighting core information such as "integrity management" and "transparency".

4.2.2 English context

Highlight the brand's technological innovation and market competitiveness, release technical innovation popular science videos and international market expansion achievements on YouTube, emphasize positioning such as "innovation leader" and "market pioneer" to meet the pursuit of core brand competitiveness by English audiences [11]; publish brand innovation case studies through English media to enhance the emotional identification of professional audiences.

4.2.3 Thai context

Focus on user experience details, share real user experience cases and service optimization initiatives on LINE Today, highlighting keywords such as "convenience" and "timeliness"; carry out Thai user interaction activities, such as "service experience collection", and convey brand warmth through delicate and euphemistic expressions [10].

4.3 Scenario-Specific Strategy: Adapting to the Characteristics of Multi-Platform Communication

4.3.1 Social media platforms

Chinese Weibo focuses on short video displays of responsibility, such as "public welfare action short videos"; English YouTube publishes technical innovation popular science videos; Thai LINE Today shares user experience graphics and service scenario short videos, adopting a kind narrative style [8].

4.3.2 News media platforms

Chinese media highlight the brand's social contributions, such as "the brand helps rural revitalization"; English media emphasize market achievements, such as "the brand ranks among the global industry TOP 3"; Thai media focus on service improvement and user feedback response [13].

5. Conclusions and Prospects

5.1 Research Conclusions
An emotional semantic decoding framework for multilingual brand reputation is constructed, integrating the BERT-BiLSTM-GRU model and cross-cultural communication theory to solve the problem of multilingual emotional semantic deviation;

The laws of multilingual emotional semantic differences are revealed: Chinese focuses on social value dimensions, English on economic value dimensions, and Thai on experience value dimensions;

The core causes of cross-linguistic emotional semantic deviation are identified: cultural context differences (42.3%), professional term translation errors (31.7%), and emotional expression habit differences (26.0%);

A three-in-one reputation enhancement strategy of "language adaptation - emotional resonance - scenario-specific" is proposed, which is proved effective through quasi-experimental verification.

5.2 Research Limitations and Prospects
The research has three limitations: first, the data only covers three languages (Chinese, English, Thai) and does not involve more languages such as Arabic and Spanish; second, the samples focus on the energy and technology industries and do not cover industries such as fast-moving consumer goods and luxury goods; third, it does not combine individual differences of audiences (e.g., age, education level) to analyze the mechanism of emotional semantic reception.

Future research can be expanded in three aspects: first, expand to more languages and platforms to improve sample representativeness; second, expand the industry coverage to explore differences in multilingual brand reputation across industries; third, combine eye-tracking experiments and in-depth interviews to deeply explore the mechanism of audiences' reception of multilingual brand emotional information.

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