

Sentiment Analysis on Social Media Review Texts from the Perspective of Appraisal Theory: A Case Study of Tao Tao Ju Brand on Xiaohongshu

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Abstract: In the digital era, social media platforms have become vital arenas for brand image co-construction, yet computational sentiment analysis often lacks the linguistic depth to interpret the nuanced mechanisms behind emotional expression, particularly for time-honored brands. This study bridges this gap by integrating Appraisal Theory with quantitative text mining to analyze 4,176 user comments about the heritage catering brand "Tao Tao Ju" on Xiaohongshu. Employing ROST CM6 and ROST EA for sentiment polarity, word frequency, and semantic network analysis, alongside a qualitative manual coding of Attitude, Graduation, and Engagement resources, the research yields several key findings. Results indicate that overall sentiment is predominantly positive (68.1%), centered on Appreciation of culinary offerings and nostalgic ambiance, but a significant cluster of negative Judgment (23.6%) targets service inefficiency. The semantic network reveals a structural decoupling between product and service evaluations. Theoretically, this study demonstrates the feasibility of an interdisciplinary "data-to-discourse" framework, while practically, it provides a precise diagnostic tool and strategic content suggestions for the digital transformation of heritage brands.

1. Introduction

When digitalization is met with social interactions, it turns the social media platforms into more than just means of communication. They turn out as lively places where brands' images are worked out together: User-generated contents which sometimes are realistic and impulsive, offer us insight on what people think of consumers: But brand sentiment analysis is mainly computer based, focusing most on measuring polarity and intensity. This "macro-scope" overlooks complicated linguistic resources like Affect, Judgment, Appreciation that weave these assessments throughout and results in a significant analytical gap

This methodological chasm is also empirically one. Appraisal theory [1] provides a powerful "microscope" to deconstruct attitude discourse but the application of it is mostly on literary texts, ads,

and formal media; very few pay attention to the informal fragmented discourses on social media in China. Conversely brand sentiment mainly focuses on new or born digital brands not legacy brands which struggle with balancing nostalgic authenticity with meeting modern expectations. As a typical Cantonese food traditional brand, “Tao Tao Ju” meets these tensions as well, so it can be regarded as an ideal example for research. In order to bridge both theoretical and empirical gaps, this study will raise three research questions: (1) What are the distributional features of users’ sentiment towards Tao Tao Ju? And what is the dominant appraisal dimension? (2) How do users use particular kinds of appraisal resources linguistically to construct, reinforce, or challenge a company's image? (3) What strategic communication lessons can we learn from this combined analysis?

2. Literature Review

Appraisal Theory, belonging to the Systemic Functional Linguistic framework with an emphasis on interpersonal meanings, proposes a trichotomy framework composed of Attitude, Graduation and Engagement for systematically interpreting evaluative languages. It works well in other settings too – they looked at literary stories [2], or emotions in human computer interactions [3]. Brand research researchers have also begun using it to explore consumer trust repair and cultural consumption narratives [4] which demonstrates that it is able to figure out what makes people see brands a certain way.

On the contrary, sentiment analysis on social media has moved from a simple polarity detection system to an advanced multi-level technology that can do behavior inference and emotional contagion modeling. For example, cognitive models of social networks [5] and real-time public opinion monitoring [6] have been developed. From the Chinese perspective, research has evolved from basic frameworks for online reviews [7] up until now with fine-grained deep learning model used for short-text platform like Weibo by Zhou (2022) [8]. These improvements place a major focus on algorithms being correct and big numbers, rather than words getting explained properly, so there is a huge hole in figuring out how people talk about emotions.

In all from what has been said in this literature, two deficiencies can be observed. From the theory side, Appraisal Theory offers a strong scaffold for us to analyze appraisal languages but it mainly applied to formal and neat text, no real operations of Chinese social media on its fragmented and informal discussion. Methodology-wise, computational sentiment analysis and linguistic appraisal analysis both progress side by side yet they remain isolated resulting in studies that opt out on depth in favor of breadth or vice versa giving up richness at the cost of rigor. Empirically speaking, current research focuses heavily on newly created digital brands and neglects the digital battles of old brand legacies. And here we have three voids: theoretical, methodological, empirical. This article wants to solve them. To attain comprehensive as well as meticulous diagnosis for an online co-building procedure of a heritage brand, this paper blends together sentiment analysis with appraisal theory forming one analytical framework and employs it for examining user-generated contents about TaoTaoJu on Xiaohongshu.

3. Theoretical Foundation

This research combines Appraisal Theory and computer sentiment analysis for a synergistic combination, forming an analytical lens on two levels. The Appraisal system, as defined by Martin & White (2005) [1], offers a linguistic structure for exploring evaluation's micro-mechanisms. The Attitude subsystem maps affective content, including Affect, Judgment, and Appreciation; the Graduation subsystem grades and focuses these attitudes; and the Engagement subsystem manages the author's dialogical voice. Together, these three subsystems demonstrate how brand values are discursively constructed.

Sentiment analysis is a kind of macro-scope in calculation. ROST CM6 and ROST EA can rapidly deal with big amount of text body, to count emotional value, find frequently-occurring theme knot, draw semantic net. These two paradigms are complementary, forming the basis of our design. Computational methods reveal what people feel and say in general terms, while Appraisal theory explains how emotions are amplified, judgments legitimized, and arguments negotiated through linguistic choices. This 'data-theory dialectic' transcends the quantity-versus-quality dilemma, enabling a systematic inquiry where quantitative sentiment clusters guide qualitative, context-sensitive linguistic investigation.

4. Research Methods and Tools

Empirical corpus consisted of user comments about the “Tao Tao Ju” brand from Xiaohongshu. Using Octoparse Web crawling, publicly indexed posts associated with the keyword "Taotaoju" were scraped over a 12-month time span from April 1, 2024 to March 31, 2025. Raw datasets were processed and normalized on Excel for analysis validity. Algorithmically removing duplicates, eliminating non-semantic contents like standalone emoticons and typo errors as well as filtering out commercial noises such as advertisements. Finally, 4,176 valid comments were obtained and encoded in UTF-8 for further analysis.

Two-stage analytical process was applied. Quantitative phase used ROST CM6 for word segmentation, frequent characteristic words extraction and semantic network drawing to represent the cognitive topology of user speech: At the same time, we use ROST EA to automatically calculate the sentiment polarity (positive / negative / neutral) and emotional intensity score of each comment. In the qualitative stage, a grounded manual coding scheme was created based on Martin & White's Appraisal Theory framework. The first author manually coded 150 randomly selected comments from the corpus in order to identify Attitude, Graduation, and Engagement resources. To guarantee that there was reliability between the coders, a second coder independently coded 45 randomly chosen comments. Inter-coder reliability test showed Cohen's Kappa value as 0.84 which represents “almost perfect” agreement thereby proving interpretive protocol to be sound.

5. Results and Analysis

The analysis revealed a multi-faceted brand image defined by a tension between product excellence and operational deficiency. This section presents the quantitative distribution of sentiment and core evaluation dimensions, followed by a qualitative interpretation of the appraisal resources deployed by users.

5.1. Sentiment Distribution and Dominant Evaluation Dimensions

From the quantitative analysis of 4,176 valid comments, it showed a mainly positive sentiment. Specifically, positive comments accounted for 68.1% of the total, while negative and neutral comments constituted 23.6% and 8.3%, respectively. From the average sentiment intensity scores it could also be found that users tended to express their emotions strongly regardless of being positive or negative with an average of 7.2/10 on positives and 6.8/10 on negatives. This general trend indicates that the Tao Tao Ju brand was generally well received by users, although some users expressed dissatisfaction.

high-frequency word analysis distilled the user discourse into 4 main evaluation dimensions: food(dishes), environment(physical space), service(service), and price(cost-effectiveness). The most frequently occurring words were "shrimp dumplings" which appeared 1,204 times, followed by "environment" (892), “service” (845), “red rice roll” (788) and “price” (654). Other words like

“queueing”, “delicious”, “slow”, “waiting”, and “expensive” also received some attention. These keywords suggest that people pay more attention to actual experience than brands themselves.

There’s a huge structural separation from a cross-tab of sentiment polarity on these 4 dimensions. From Table 1, "Dishes" and “Environment” are two main advantageous clusters with low proportion (5.6% & 8.7%) of negative comments respectively. On the other hand, "Service" was the worst-performing group with no less than 70.2% bad ratings Price Dimension is extremely divided at 29.5%. That means it feels very different to everyone. This uncoupling suggests we evaluate food quality in an entirely different mental domain as we do service evaluations: great dishes can't make up for errors, nor will poor service necessarily spoil our pleasure in good eating.

Table 1 Cross-Dimensional Sentiment Polarity Distribution

Core Dimension	Positive Comments	Negative Comments	Neutral Comments	Negative(%)in this Dimension
Dishes	1950	120	65	5.6%
Service	210	605	45	70.2%
Environment	890	85	120	8.7%
Price	320	180	110	29.5%

The semantic network analysis further corroborates this structural divergence. The network is organized around two largely disconnected clusters. The first, a robust 'product' cluster, radiates from the central node 'Tao Tao Ju' toward culinary terms such as 'shrimp dumplings' and 'red rice rolls,' strongly associated with positive affective terms like 'delicious.' The second, a 'service-deficiency' cluster, tightly links operational friction terms such as 'queueing' and 'slow' to the service node. The lack of strong interconnections between these two clusters confirms that users treat product quality and service experience as decoupled evaluative domains.

5.2. Linguistic Construction of Brand Image through Appraisal Resources

While quantitative analysis reveals what users evaluate, it does not capture how they linguistically construct evaluations. This section applies the Attitude, Graduation, and Engagement framework of Appraisal Theory to interpret how users deploy lexical and grammatical resources to build, reinforce, or challenge brand image.

Manual coding of the Attitude subsystem showed a clear pattern. Appreciation resources were most frequent (2,045 instances), overwhelmingly positive, focusing on sensory dish qualities and dining ambiance (e.g., “thin skin and lots of filling”, “old Guangzhou feel”). Judgment resources (1,089 instances) were predominantly negative, targeting service (e.g., “waiters are cold”, “queueing system is chaotic”). Affect resources (1,250 instances) added emotional coloring across dimensions, from delight to disappointment. Thus, the brand’s discursive assets lie in Appreciation, while its vulnerability lies in Judgment.

These raw attitudes were systematically calibrated via Graduation resources. Users amplified positive evaluations with intensifiers (“extremely delicious”, “absolutely authentic”), strengthening culinary excellence. Negative price comments were softened with downtoners (“a bit expensive”, “slightly pricey”), expressing dissatisfaction without harshness. Service complaints, however, resisted softening and received intensified expression (“waited forever”, “extremely indifferent”), marking service as a requirement that cannot be compromised.

Engagement resources enriched dialogic texture. Heteroglossic markers expanded the discourse: personal pronouncements (“I think”, “to be frank”) positioned the reviewer as sincere, while acknowledged external voices (“my friend said”, “recommended online”) borrowed social authority. A representative comment – “My friend said Tao Tao Ju was a must eat in Guangzhou... It really is

just as good as everyone says” – artfully weaves external expectation (Engagement: Acknowledge) with personal quality confirmation (Attitude: Appreciation), creating a multivoiced, credible evaluation that transforms individual dining into socially validated brand narratives.

The three subsystems synergistically construct a negotiated brand image. As shown in Table 1, the quantitative polarity distribution corroborates this fragmented structure: culinary quality and environment are sustained by overwhelmingly positive Appreciation (with negative proportions as low as 5.6% and 8.7%, respectively), amplified by Graduation resources, forming the brand's discursive strengths. In stark contrast, service quality is undermined by predominantly negative Judgment (70.2% negative in this dimension), escalated by forceful Graduation, and reinforced by cited social voices. Price, with a nearly balanced polarity split (29.5% negative), occupies a polarized intermediate position. This textual and quantitative alignment confirms that social media brand image is not monolithic but fragmented, contested, and continuously reshaped through users' linguistic choices.

6. Conclusions

6.1. Main Findings

The study successfully applied appraisal theory combined with computational sentiment analysis to decode the digitally co-constructed brand image of heritage brand Tao Tao Ju. The results show that it's a very divided brand: one positive domain where people agree they like the real food and the culture atmosphere around them; another negative domain that is mainly about judgment, not appreciating bad service quality. The research finds that the brand image on social media is no fixed asset but a fragmented linguistic phenomenon constantly being created anew as users selectively employ Attitude, Graduation and Engagement.

6.2. Insights and Suggestions

Theoretical aspect: This study proves a repeatable “data-theory dialectic” path, which crosses over the longstanding gulf between quantitative scope and qualitative detail. Practically it gives Tao Tao Ju as well as similar traditional brand an exact diagnosis framework. Strategic communication needs to take advantage of the known advantages to create contents that can provide visual presentations on the sensory authenticity and cultural legacy of food stuffs and atmosphere which fits users' positive evaluation. However, negative service-related comments require targeted responses. Brand creates specific feedback channels like Weibo hashtags where it admits and replies publicly about complaints regarding work effectiveness & attitude. The transformation of one-way complaint into two-way conversation is realized with Engagement resources. When dealing with polarized price views, we need to change our talking from cost to value and openly tell how those top quality raw materials for our premium products have been carefully chosen and made in the old ways.

6.3. Limitations and Future Directions

Several limitations warrant acknowledgment. First, this study focuses on a single heritage brand (Tao Tao Ju) on a single platform (Xiaohongshu). The platform's user demographic (predominantly young female users) and the catering industry context constrain generalizability. Thus, our conclusions are primarily referential for catering heritage brands on Xiaohongshu. Future research should extend to multiple platforms, multiple heritage brands (e.g., from cultural creativity, cosmetics), and cross-industry comparative studies.

Second, the dictionary-based tools (ROST CM6 and ROST EA) cannot reliably identify

Cantonese dialects, online slang, sarcasm, or catering neologisms, which may lead to sentiment classification bias. To partially verify the error margin, we manually re-annotated a small random subsample (5% of the corpus) and found an estimated error rate of approximately 8–10%. Future research should integrate advanced deep learning NLP models to improve sentiment recognition accuracy for social media discourse.

Third, regarding analytical parameter transparency. This study adopts ROST CM6 to construct the semantic network. Although mainstream default parameters widely used in relevant heritage brand studies are applied to ensure the rationality of results, the lack of transparent methodological parameters may reduce the replicability of the semantic network analysis. Future research should systematically record all analytical parameters to improve methodological rigor.

Fourth, despite acceptable inter-coder reliability (Cohen's Kappa = 0.84), manual coding remains subjective, and the short empirical cycle limits long-term tracking. Future research should adopt semi-automated coding protocols and longitudinal designs.

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