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| RESEARCH ARTICLE

A Cross-cultural Study of Humor Intensity in Chinese and English Family Jokes: A Large Language Model-Based Approach

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| ABSTRACT
Humor is frequently conveyed through jokes, with family jokes serving as a particularly insightful medium that reflects both humor-creation techniques and culturally embedded perspectives on familial relationships. This study develops a computational model based on Large Language Models (LLMs) to quantify humor intensity in Chinese and English family jokes, focusing on three key indicators: ambiguity, sentiment, and incongruity. Our analysis reveals a 3:1:1 weighting among these factors, underscoring ambiguity as the most influential determinant of humor intensity. The sentiment score of Chinese family jokes showcases a more pronounced polarity. Chinese and English family jokes share similar incongruity structures, but the Chinese family jokes tend to combine both semantic contrasts and plot reversals. English family jokes often have higher ambiguity scores than Chinese family jokes, which typically demonstrate this effect depending on multiple factors such as plot and cultural background. This study elucidates cross-cultural variations in humor design preferences and cultural conceptions of family through a comparative analysis.

| KEYWORDS

Large Language Model; Natural Language Processing; Humor Computation; Family Joke.

| ARTICLE INFORMATION

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1. Introduction

Coming from the ancient Greek word "χυμός" (chymos), the word "humor", according to medieval pathology, refers to four major categories of bodily fluids that control health and mood (Hoad, 2003). The different proportions of the fluids can lead to different body states (Zhuang, 2009). In the 16th century, the meaning of "humor" expanded from "bodily fluids" to "emotion" and "state of mind". It was not until the 18th century that it came to indicate the characteristics that make people laugh. The Oxford Dictionary explains it as the ability to make people laugh or the nature of being funny (2005: 761). Lin Yutang was the first to translate the English word "humor" as "幽默" (Pinyin: yōumò) (Shi, 2019). The Modern Chinese Dictionary explains it as funny or ridiculous and meaningful (2016: 1582).

Three major theories support humor studies: the Superiority Theory, the Relief Theory, and the Incongruity Theory (Cai & Yin, 2005). The Incongruity Theory has been confirmed as a necessary condition for humor and remains the most important theoretical foundation in computational humor research to this day (Lin et al., 2016). Based on the Incongruity Theory, Raskin proposed a linguistic model of humor called the Semantic Script Theory of Humor (SSTH). According to SSTH, to achieve humor, a text or passage must contain at least two conflicting semantic scripts which share some connection on a deeper level. The unexpected generated by this conflict is the essence of humor (Raskin, 1991). Salvatore Attardo and Victor further developed another model, the General Theory of Verbal Humor (GTVH), which identifies six primary humor elements: script opposition, logical mechanisms, context, target, narrative strategies, and humorous language (Attardo, 1991). Derived from SSTH, the concept of "script opposition" refers to a plot or structure that contradicts conventional understanding.

Jokes, a typical form of humor characterized by brevity, conciseness, and ease of dissemination, are considered as a lubricant in human interaction (Ma, 2024). Due to the concentration and clarity of their humor elements, jokes serve as an important starting point for studying humor. Among them, family jokes dominate a significant position. The family, as a basic unit of society (Wu, 2024), is one of the closest settings for emotional communication and interpersonal relationships. The distinctive features of family jokes, which reflect family interaction patterns, lie in their characters, typically involving parents, grandparents and children. Comparative studies of family jokes under Chinese and Western cultural contexts can provide deeper insights into the respective preferences in humor creation, as well as clarify the differences in family values across cultural backgrounds.

With the rapid development of artificial intelligence, large language models (LLMs) have achieved milestone success in natural language understanding (Chowdhery et al., 2023). This success can provide new ideas for humor studies. During the pre-training phase, the models are equipped with extensive language knowledge (Li et al., 2023), incorporating various types of textual data, such as novels, news articles, social media posts, and movie scripts. This diversity enables the model to understand and generate types of humor in various styles. Additionally, through the use of meta-training, LLMs can be instructed to act based on researchers' intentions (Ouyang, 2022). In humor research, LLMs can employ predefined patterns or rules to identify typical joke structures, such as the "setup + punchline" format. Furthermore, they can leverage attention mechanisms to highlight key information (Zhao & Wang, 2024), utilizing word embeddings and methods like cosine similarity and Euclidean distance to calculate the semantic similarity between sentences and evaluate their potential associations. They can also construct dependency trees for sentences to analyze grammatical relationships between words, aiding in the identification of potential ambiguity in their meanings (Liu et al., 2024). Additionally, LLMs can be trained using supervised learning methods to develop sentiment classifiers, which, when combined with contextual information, can detect implicit emotions or sarcasm in texts. Many factors of humor recognition can be quantified, and the proportion of them can be calculated through scientific methods such as entropy weight analysis. This process transforms the abstract concept of humor into a computable standard, facilitating systematic and objective research.

Therefore, this study aims to address the following questions based on LLMs:

① Are there similarities or differences in the humor intensity of Chinese and English family jokes, and in what specific aspects does this manifest?
② What are the underlying factors that lead to similarities or differences in the humor intensity of Chinese and English family jokes?

2. Study Design

Previous studies of humor recognition and generation have been investigated across various domains. Kumari et al. (2024) introduced a multi-task learning framework to identify humor in emoji data by leveraging techniques from natural language processing (NLP) and computer vision (CV). Issa (2024) utilized BERT sentence embeddings to compute humor in parallel neural networks. Bertero et al. (2016) conducted humor recognition work using Conditional Random Fields (CRF), introducing both acoustic and linguistic features. Hasan et al. (2019) developed a multi-modal humor dataset named UR-FUNNY, which integrates three modalities: text, visual, and audio. He also proposed a memory fusion network for multi-modal feature integration. Chen and Lee (2017) proposed a method for humor recognition based on convolutional neural networks (CNN). Weller et al. (2020) focused on humor generation, designing a humor converter that achieved comparable popularity in human-editing design A/B testing. Chakrabarty et al. (2020) designed an unsupervised framework for generating sarcastic humor, exploiting its semantic incongruity, and transforming the style of original text through editing and retrieval to match artificial humor results. In terms of humor computation, Zhang (2021) developed a multi-granularity semantic interaction and understanding network to predict humor by interacting and interpreting semantic information in the "set-up" and "punchline" components of humorous texts. Ren (2021) proposed a multi-task learning model for humor and pun recognition, along with a multi-level sentiment and semantic memory network to capture features of sarcastic expressions, enabling humor recognition from both sentiment and semantic perspectives. Lin (2024) constructed a Chinese humor corpus tailored for social media, integrating sentiment orientation, semantic inconsistency, and ambiguity features with semantic representation for text-based humor recognition.

This paper draws on the valuable experiences of scholars and integrates sentiment and semantic indicators to build a humor recognition scoring model for short English and Chinese family jokes.

2.1 Data Collection and Cleaning

"ZhiLe Joke" (a Chinese joke website) and "LaughFactory" (an English joke website) were selected for the rigor of the comparison as both platforms have a repository of various jokes including family jokes. To enhance the comparability between the Chinese

and English datasets, a trained model is used to extract key information from the jokes while preserving their basic structures, thereby achieving data standardization.

2.2 Calculation Indicators

The design of humor computation features can be categorized into the following types: linguistic-based features, humor theory-based features, humor structure and type-based features, and content- and context-based features (Lv et al., 2022). Humor theories refer to the three major classical theories mentioned in this paper, as well as derivative theories such as SSTH. Humor theory-based studies mainly focus on sentiment and incongruity. Linguistic-based features typically involve studies centered on the phonetic, semantic, and syntactic levels of language. Content- and context-based features can be obtained through pre-trained neural networks. and large-scale models, such as Bi-LSTM, GPT, and BERT models. This study approach can provide support for humor computation research and enhance the ability to identify humor. Studies based on humor structures and genres can, for example, follow the SSTH structure to design features that reflect the semantic associations between sentences.

Large language models incorporate advanced natural language processing techniques, such as word embeddings, attention mechanisms, and sequence-to-sequence models. These technologies enable the models to analyze and generate text more accurately, making them suitable for determining specific indicators based on linguistic features, content and context, and humor structures.

2.3 Training Data

2.3.1 Sentiment Intensity Calculation

In this study, the BERT model is employed to calculate the sentiment scores of jokes, where positive and negative values represent the sentiment polarity (positive or negative). As a multi-language model, BERT is well-suited for analyzing bilingual (Chinese-English) jokes. Beyond capturing contextual information, BERT can associate words in jokes with sentiment-related words in a sentiment candidate set at the semantic level, effectively aiding in the identification of internal sentiment features (Lin, 2024). As a pre-trained model, it has undergone unsupervised learning on large-scale corpora, meaning no retraining is required. Additionally, it can be used directly without labeled data. Python code was developed to import the bilingual training jokes in two separate batches, and the resulting scores were normalized to integers ranging from -10 to 10, facilitating the calculation of humor intensity scores.

2.3.2 Incongruity Intensity Calculation

Following the SSTH framework, jokes are divided into two critical components: the "set-up" and the "punchline". By training the model to obtain embeddings for these two parts, the text is transformed into vector form, enabling in-depth analysis through mathematical methods. The cosine similarity between these two vectors is then computed, reflecting the semantic similarity between the "set-up" and "punchline" in the semantic space. Cosine similarity is a commonly used metric for measuring the similarity of vector directions and effectively reflects the semantic relatedness between words. Subtracting the cosine similarity from 1 yields the incongruity intensity. Let $\underset{a}{\rightarrow}$represent the vector representation of the "set-up" portion of a joke, and $\underset{b}{\rightarrow}$the "punchline" portion. The components of $\underset{a}{\rightarrow}$are denoted as a_i (i=1,2,...,n), and the components of $\underset{b}{\rightarrow}$are denoted as b_i (i=1,2,...,n). The formula is as follows:

$$incongruity\ value = 1 - \frac{\sum_{i=1}^{n} a_i\, b_i}{\sqrt{\sum_{i=1}^{n} a_i^2}\sqrt{\sum_{i=1}^{n} b_i^2}}$$

This step is significant because humor theories emphasize the principle of incongruity, which focuses on the contrast between elements. A lower cosine similarity indicates a greater semantic disparity between the "set-up" and the "punchline", and subtracting this value from 1 makes this incongruity more apparent. The resulting value is then normalized to transform it into an integer within the 0-10 range, using a scientifically sound normalization algorithm. This ensures comparability and interpretability of results across different jokes by bringing them to the same scale.

2.3.3 Ambiguity Intensity Calculation

For ambiguity intensity calculation, a pre-trained large-scale model is first used to extract the words most likely to cause ambiguity in each joke. For Chinese jokes, this involves using "synonym" library based on word vector models to retrieve the 10 closest synonyms for each input word along with their similarity scores. The library leverages large-scale word vector models to return a list of the closest synonyms for each input word and calculates the cosine similarity between each synonym and the input word. The similarity scores of the retrieved synonyms are then normalized to convert them into dimensionless standardized values. After obtaining these standardized scores, the mean of these scores is calculated, and its absolute value is taken to

quantify the degree of ambiguity. The absolute mean of the standardized scores is mapped to a 0-10 range to ensure the rating scale aligns with practical applications. The standardized score z_i is calculated using the formula:

$$z_i = \frac{scores_i - \mu}{\sigma}$$

Where $scores_i$ represents the similarity score of the i synonym in the list, μ is the mean of the similarity scores of the 10 closest synonyms retrieved from the library, and σ is the standard deviation.

The core idea is that a larger absolute standardized score indicates a smaller difference between the word and its synonyms, implying lower ambiguity, while a smaller absolute score suggests higher ambiguity. For English jokes, the process involves using the WordNet corpus to identify the most ambiguous words in each joke, followed by a search for synonyms in WordNet and counting the number of synonyms sets to derive the ambiguity score.

2.4 Entropy weighting method to calculate weights

The methodology employed in this study involves calculating entropy weights after obtaining scores for sentiment, incongruity and ambiguity values using training data. The entropy weighting method, as an objective approach for weight calculation, helps minimize subjective interference in weight assignment, improving the objectivity and rationality of weight distribution. This method also provides a better explanation of the role and significance of each indicator in humor intensity computation.

2.5 Experimental Data Calculation

After determining the weights, calculations of three indicators are repeated, incorporating the weights to redistribute the scores, and the final sum is computed.

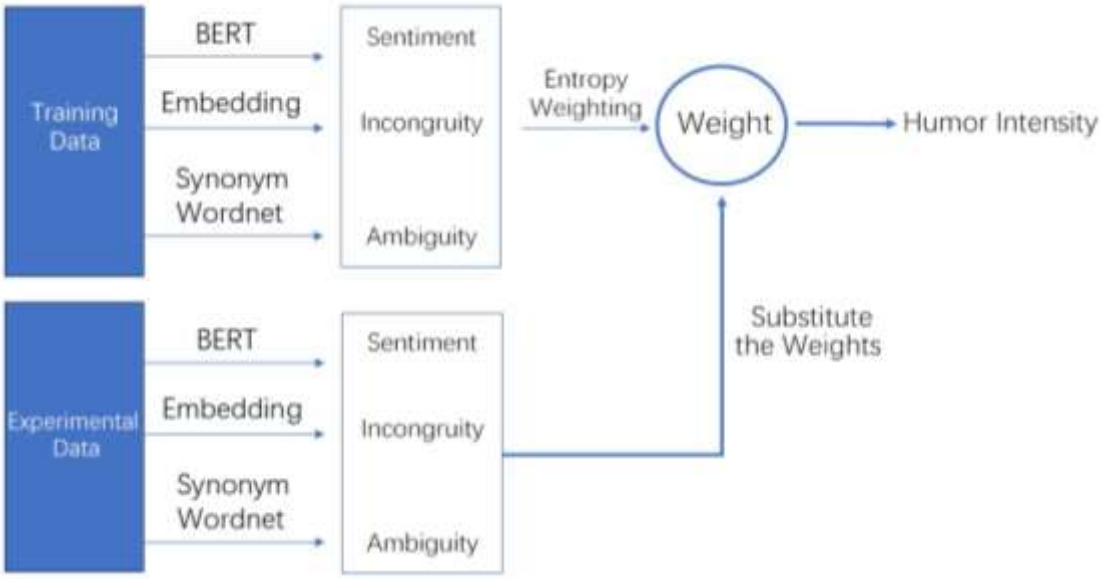

Figure 1 Model Framework

3. Discovery and Discussion

3.1 Differences and Similarities of Humor Intensity of Chinese and English Family Jokes

Through the entropy weight method, the weights of the three indicators are calculated and standardized to a ratio of 1:3:1.

Table1 the Weight of Three Indicators

Sentiment Intensity	0.176663
Ambiguity Intensity	0.636639
Incongruity Intensity	0.186698

This highlights the importance of ambiguity, which aligns with Ritchie et al.'s (2006) analysis that ambiguity is a common mechanism for creating humor in joke texts. Although incongruity is a crucial indicator in the incongruity theory, the

computational results show that its influence is relatively small, and sentiment intensity accounts for the lowest proportion. This suggests that the sentiment content of jokes themselves is insufficient to significantly impact the audience's emotions. Future researchers could consider extracting sentiment intensity from the comedian's audio and the audience's reactions as new factors for analysis.

3.1.1 Sentiment Score

In terms of sentiment scores, Chinese and Western family jokes exhibit some similarities. As shown in Figure 2, the sentiment intensity of jokes in both languages is negative, with Chinese jokes ranging from -0.64 to -0.232 and English jokes ranging from -0.564 to -0.228. This indicates that both reflect negative emotions. Additionally, as seen in Table 2, the median sentiment intensity for Chinese jokes is -0.364, while for English jokes, it is -0.342. The two medians are quite close, suggesting that there is little difference in the sentiment intensity of Chinese and English family jokes at the intermediate level. Furthermore, the interquartile range (IQR) lengths of both datasets are similar, implying that Chinese and Western family jokes have comparable distributions for the middle 50% of data, i.e., they share consistency in their central tendency. However, sentiment extremity shows a significant difference between Chinese and Western family jokes. As shown in Table 2, the minimum sentiment intensity for Chinese jokes (-0.64) is notably lower than that for English jokes (-0.564). Additionally, based on the lengths of the upper and lower whiskers in the boxplot, the distribution of Chinese jokes is relatively more dispersed, with their maximum and minimum values being farther from the median. This reflects that Chinese family jokes have greater variability in sentiment scores.

When comparing joke data, the joke with the highest negative sentiment intensity in Chinese is as follows:

(1)"爸爸，别打气了，要爆胎。"
爸爸不听，继续打气，结果车胎爆了。"不听我的，爆胎了吧！快进屋，要下大雨。""你先进，我换胎。"弟弟进屋，随后风雨大作，爸爸淋成落汤鸡进来。弟弟说"不听老人言，吃亏在眼前！" 爸爸听后揍了弟弟一顿。("Dad, stop pumping or the tire will explode!". Ignoring me, he kept inflating until *pop*! "Told you it'd blow! Come inside. Storm's coming." "You go first. I'll fix the tire." As little brother entered, the downpour drenched Dad completely. "Old-timer's advice never fails!" he gloated, which explains why he got spanked right after.)

The English joke with the highest negative sentiment score is as follows:

(2)A boy asked if bugs were good to eat. Father said it was disgusting and not to talk about it at dinner. After dinner, the boy said there was a bug in his father's soup, but it was gone.

Table 2 Comparison of Median, Maximum, and Minimum Sentiment Intensity of Chinese and English Jokes

Types	Median	Max	Min
Joke_ZH	-0.364	-0.232	-0.640
Joke_EN	-0.342	-0.228	-0.564

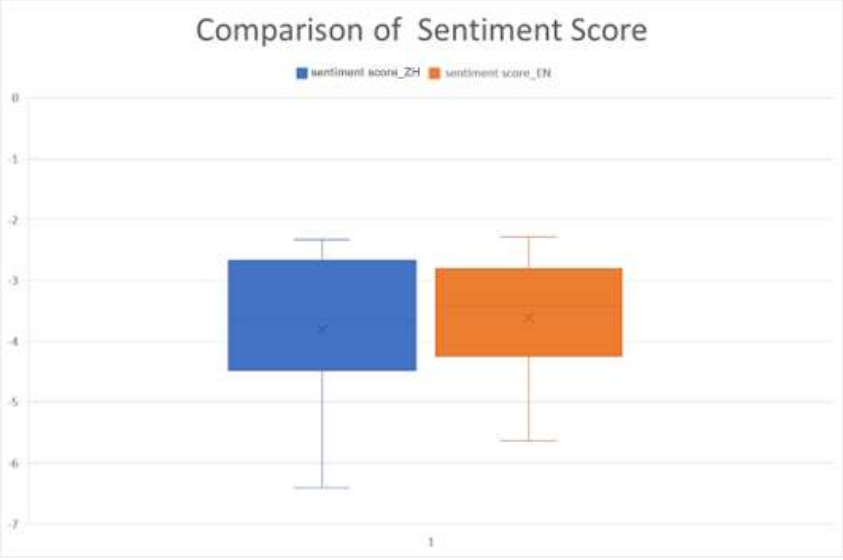

Figure 2 Box Plot of Sentiment Score

3.1.2 Ambiguity Score

Ambiguity score is the most significant factor. As shown in Table 3, the median ambiguity score of English jokes (6.5) is notably higher than that of Chinese jokes (3.2). Moreover, Figure 3 demonstrates that the English data mostly significantly outperforms the Chinese data. The diversity of English vocabulary allows a single word to have different meanings in different contexts, providing more possibilities for ambiguities in jokes. For example: :

（3）Why do Jewish mothers make great parole officers? They never let anyone finish a sentence!

The word "sentence" can mean both "a sentence" and "a prison sentence". In the second sentence, "They never let anyone finish a sentence", it appears to describe Jewish mothers who often interrupt others, preventing them from finishing a sentence. However, given the mention of parole officers earlier, it can also be interpreted as Jewish mothers, acting as parole officers, not allowing parolees to serve their full sentences. This pun creates humor.

In contrast, Chinese jokes often rely more on situational context and cultural connotations. For instance:

（4）**晚**上想去外面打游戏，老爸死活都留不住我后向老妈求援，老妈从厨房摸出一把刀冷哼一声："留不住？我今天就给你表演一个刀下留人。"(I tried to go gaming at night. When Dad failed to stop me, he called Mom. She whipped out a kitchen knife and sneered: 'Can't keep him? Let me demonstrate how to spare him under the knife!')

In a general Chinese context, "刀下留人" (Dāo xià liú rén, literally translated into "set the knife aside and leave the person ") is a culturally rich expression that is often found in period dramas and literary works. For example, when a criminal is about to be executed, someone often shouts "刀下留人" to stop the execution and seek a retrial or save the criminal. In this case, when the mother takes out a knife and says she will "刀下留人", she repurposes this cultural expression, combining it with the current situation of trying to stop her child from leaving.

Table 3 Comparison of Median, Maximum and Minimum Values of Ambiguity Score of Chinese and English jokes

Types	Median	Max	Min
Joke_ZH	3.20	4.03	2.95
Joke_EN	6.5	23	0

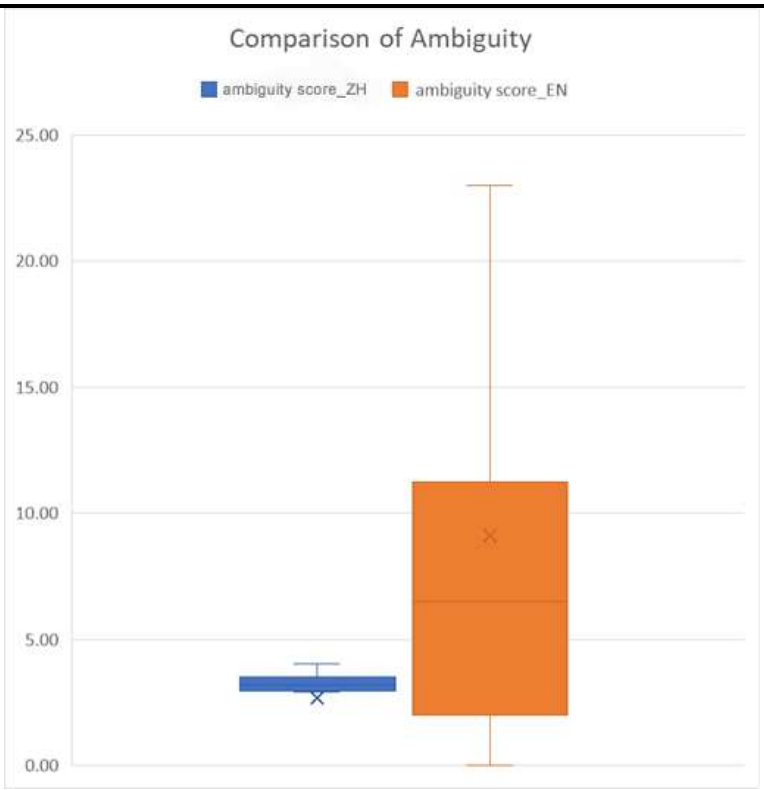

Figure 3 Box Plot of Ambiguity Score

3.1.3 Incongruity Score

From Table 4, it can be observed that the range of extreme values between Chinese and English jokes is relatively narrow. The median score for English jokes (5.846) is slightly higher than that for Chinese jokes (5.373). Furthermore, as shown in Figure 4, the interquartile range (IQR) length of English jokes is marginally longer than that of Chinese jokes, indicating that English jokes exhibit a slightly higher degree of incongruity in their humor intensity compared to Chinese jokes. Interestingly, Chinese jokes occupy both the highest score (8.101) and the lowest score (2.821) in terms of humor intensity, suggesting that Chinese humor demonstrates greater flexibility in achieving incongruous comedic effects. The Chinese joke with the highest incongruity intensity is as follows:

（5）“火箭为什么飞得那么快呀？” “你没见火箭飞行时，屁股上有一团火吗？谁屁股上着了火能不快跑！”(“Why does the rocket fly so fast?” “Don't you see a fire on the rocket's butt when it flies? Who can't run fast when their ass is on fire!”)

An anthropomorphic approach is used here. When the protagonist asks why the rocket flies fast, another person does not give a scientific and serious explanation, but suddenly anthropomorphizes the rocket and replies with an extremely absurd, non-scientific reason: “Of course it runs fast when its butt is on fire”. This shift from normal scientific expectations to nonsensical explanations creates a contrast, in which the semantic ambiguity of the Chinese language plays a role. The Chinese joke with the lowest incongruity score, on the other hand, is as follows:

（6）我考试成绩很差爸爸看了试卷抓着我就打，打累了就都坐在沙发上。本来我想问他吃饭了没有，谁知道脱口而出：爸爸，你没吃饭吧！结果又是一顿毒打！(“After the beating for my bad grades, Dad collapsed on the couch. Trying to ask ‘Are you hungry?’ I slipped: ‘You must be starving!’, which explained why the next round felt more vigorous.”)

The reversal in this is not created through semantic distancing. The change from getting a beating to the next vigorous one is difficult to calculate through word embedding methods. The reversal here comes from the rise and fall of the plot, the joke starts by creating a tense atmosphere where the child does poorly in the exams and the dad beats the child in anger. The very idea that the child tries to ease the awkwardness causes the reader to relax a little in anticipation of a possible de-escalation of the situation. But the phrase, “You must be starving?” backfires in this context. This verbal slip is unexpected, and it creates a deviation from where we would normally expect the conversation to go.

Table 4 Comparison of Median, Maximum and Minimum Values of Incongruity Score of Chinese and English jokes

Types	Median	Max	Min
Joke_ZH	5.373	8.101	2.821
Joke_EN	5.846	7.899	3.433

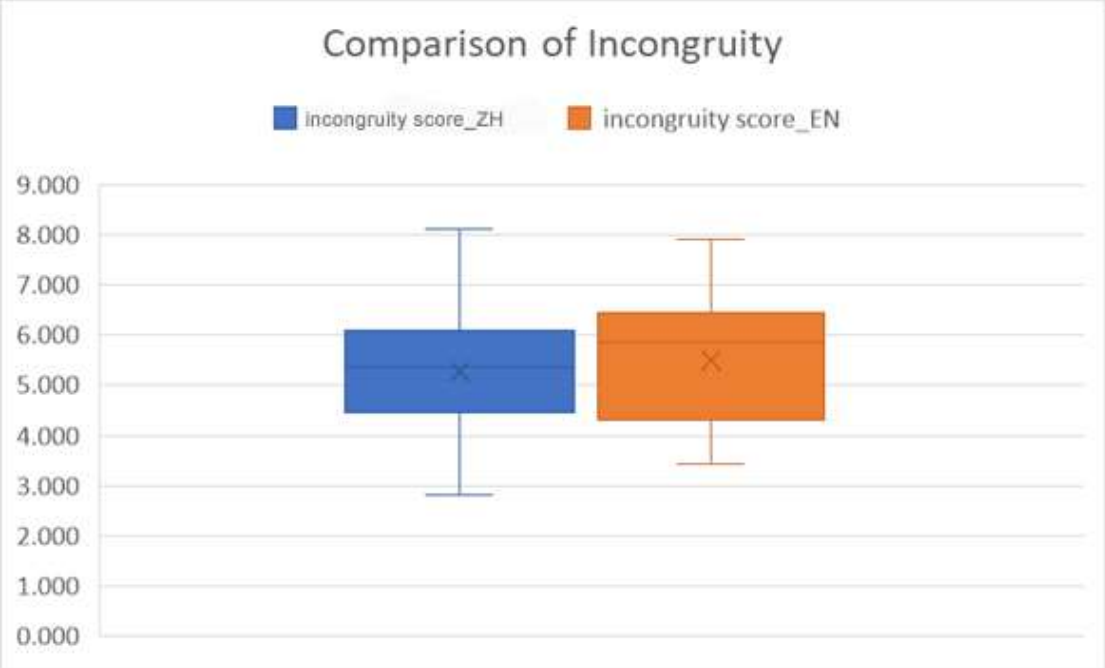

Figure 4 Box Plot of Incongruity Score

3.2 Reasons for the Similarity and Difference in the Humor Intensity of Chinese and English Family Jokes

Through a comprehensive analysis of the ambiguity score, sentiment score, and incongruity score, it is shown that English family jokes achieve a higher overall score compared to Chinese family jokes. The reasons are analyzed below:

In terms of sentiment score, Chinese jokes exhibit a wider range of extreme values. Family jokes with stronger negative emotional undertones in Chinese humor often rely on "spanking-related humor" to create comedic effects, a narrative device that is relatively rare in English humor. This disparity reflects the differing family values and parenting philosophies between Chinese and Western cultures. In Chinese culture, elders hold high expectations for younger generations and bear a strong sense of responsibility for their upbringing. When a child displays behavior or speech that deviates from traditional norms or etiquette, it often triggers an intense reaction from the elders, which, in the context of jokes, is exaggerated into a "spanking" scenario, thereby amplifying the emotional negativity.

In contrast, Western culture emphasizes individual independence and equality, resulting in less pronounced hierarchical differences between generations within families. Even if a child's words or actions are slightly inappropriate, they are unlikely to provoke the intense reactions often seen in Chinese culture.

In terms of the Ambiguity Score, Chinese jokes tend to use fewer polysemous words or puns due to the relatively fixed and explicit structure of the Chinese vocabulary system. While Chinese has a rich repository of idioms and riddles, the polysemy of its words is relatively limited, resulting in a smaller number of synonymous sets and lower similarity among them. In contrast, English benefits from the presence of homophones and polysemy, as well as the ability of many words to change their part of speech. These characteristics, which can lead to confusion and ambiguity, allow English humor to rely on nuanced word choices, enabling the creation of puns.

Regarding the Incongruity Score, the similar distribution ranges of this metric indicate that designing incongruities is common in both Chinese and English jokes. This similarity also suggests that both languages share structural parallels in transitioning from setup to punchline. However, Chinese jokes not only leverage linguistic variations to create humor but also excel at integrating the narrative progression with language use. This dual approach explains larger gaps of extreme values in Chinese family jokes. Additionally, Chinese humor often emphasizes the smooth progression of narrative development, contributing to a more stable distribution of incongruity scores in Chinese jokes, avoiding excessive dispersion.

In conclusion, the flexibility of English language enables English humor to frequently employ linguistic ambiguity to generate humorous effects. While English family jokes achieve a higher overall score, this does not imply that Chinese jokes are less humorous. Chinese humor often relies on narrative design, sociocultural contexts, idiomatic expressions, and nuanced portrayals of interpersonal relationships to create humor. Therefore, humor intensity cannot be solely measured by linguistic ambiguity; it also requires a comprehensive consideration of context, culture, and individual experiences.

Table 5 Comparison of Median, Maximum and Minimum Total Scores of Chinese and English jokes

Types	Median	Max	Min
Joke_ZH	36.307	47.484	13.666
Joke_EN	56.666	154.403	13.741

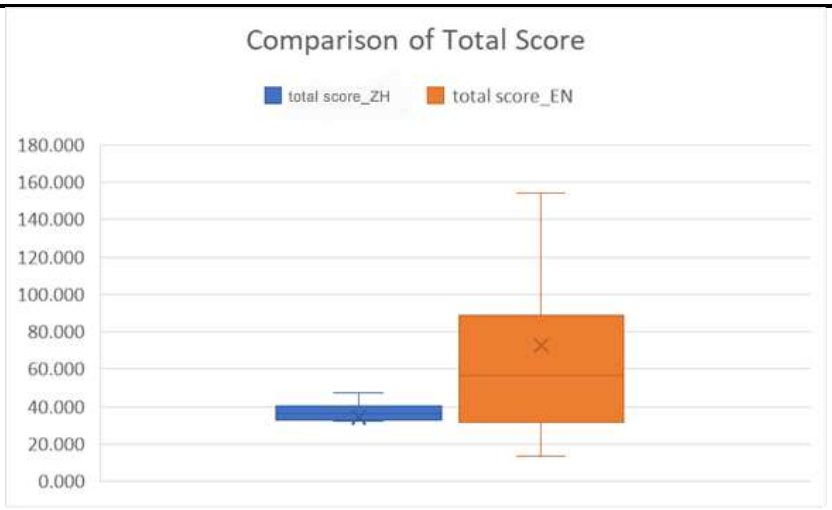

Figure 5 Box and Plot of Total Score

4. Conclusions

4.1 Major Findings

Chinese and English family jokes exhibit distinct characteristics in three indicators. Regarding sentiment intensity, Chinese jokes demonstrate more pronounced data dispersion, reflecting the differing family ideologies of these two cultures. In China, there is a stronger emphasis on the disciplinary responsibility of elders, while Western cultures place greater importance on individual equality and independence (Wu, 2018). Besides, jokes in both languages share similar incongruity structures. However, distinctive distributions of extreme scores indicate the flexibility in creating inconsistent effects for Chinese jokes humor, which is generated through not only semantic contrasts but also plot reversals. As for ambiguity intensity, English jokes are significantly higher than Chinese ones, suggesting that English leverages its advantages in vocabulary diversity to excel in the use of polysemous words and puns, while Chinese humor places greater emphasis on context and cultural connotations to create humor.

When considering the weight of evaluation factors, the ambiguity intensity accounts for 3 out of the total score, while sentiment intensity and incongruity intensity each account for 1, as determined by the entropy weight method. This highlights the relative importance of ambiguity in overall evaluations, but it is equally clear that other factors cannot be overlooked as they collectively influence the humor of jokes. Chinese jokes, though slightly lower in overall score, do not necessarily mean they are weaker in creating humor. Instead, they convey humor through multiple dimensions, including narrative design, sociocultural background and so on, demonstrating that humor is a multidimensional concept that cannot be solely measured by linguistic ambiguity.

4.2 Limitations and Prospects

Firstly, in this study, the calculation of ambiguity requires consideration of synonym research. However, dictionaries that can simultaneously accommodate a large number of Chinese and English synonyms are relatively scarce, necessitating the use of two different methods for calculation. This may somewhat compromise the rigor of the analysis. Additionally, the current research is based on a limited number and scope of Chinese and English family joke samples. Expanding the sample collection to include jokes created across different eras, regions, and social classes could enhance the universality of the conclusions. For example, collecting more family jokes from diverse regions could help determine whether such expansion would impact the results of the analyses of the three indicators. Secondly, societal evolution is followed by changes in the style of family jokes and people's understanding of this type of humor. Conducting longitudinal studies across different periods to compare differences between Chinese and English family jokes could provide insights into underlying social transformations and language evolution. Furthermore, the current analysis primarily focuses on the textual characteristics of jokes themselves, with insufficient attention to the actual humorous effects such as audiences or readers' reactions. In the future, surveys, interviews, and other methods could be employed to explore the differences in audience perceptions of Chinese and English family jokes, as well as their specific thought in understanding sentiment, capturing incongruity, and interpreting ambiguities. This would refine the study of the mechanisms behind humor effect generation.

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