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# Yesterday once more: collective storytelling and public engagement with digital cultural products on the music streaming platform

Cheng-Jun Wang<sup>1</sup> , Xinzhi Zhang<sup>2</sup> , Zepeng Gou<sup>1</sup> & Youqin Wu<sup>1</sup>

Drawing on narrative transportation theory, we propose that when people consume a cultural product, they consume their emotions and memories through collective storytelling. Such emotions and memories are amplified by user comments on social media, enhancing the product's influence and triggering audience engagement. We collected public data from NetEase Cloud Music—a major music streaming platform in mainland China—to investigate how the emotions and memories expressed in user comments influence the songs' impact. Findings indicate that autobiographical narratives and negative emotions in user comments significantly boost a song's influence. Moreover, user comments are particularly effective in promoting emerging artists with limited resources compared to their more established counterparts. This study advances the narrative transportation theory by emphasizing the role of active audiences and collective storytelling. Empirically, it extends the existing literature on the factors influencing cultural products on music streaming platforms in a non-Western context.

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## Introduction

When you listen to music on a streaming platform, what are you truly experiencing? The narrative paradigm of human communication (Fisher, 1987), particularly the narrative transportation theory (Green and Brock, 2002; Green et al., 2004; McQueen et al., 2011; Thomas and Grigsby, 2024), argues that audience's emotions and memories evoked by cultural products drive audience engagement. Narrative transportation, defined as "an experience of cognitive, emotional, and imagery involvement in a narrative" (Green et al., 2004, p. 311), effectively enhances media enjoyment. Studying how people immerse themselves in narrative worlds during their cultural consumption experiences is crucial for evaluating cultural products.

Understanding why users engage with cultural products in the media market is crucial for both artists and platforms. In this study, we use cultural product's influence—defined as popularity and ratings on digital platforms—as a proxy for success. While most existing research focuses on how the source and features of messages impact information processing (Chaiken, 1980; Chen and Chaiken, 1999; Chaiken and Ledgerwood, 2012; Wang and Zhu, 2019; Zhang and Zhu, 2022), the role of the audience in shaping cultural product's influence remains underexplored. Since most cultural products are now disseminated via social media, where user comments become a prominent feature, it is vital to consider these comments when examining factors influencing a cultural product's popularity.

Drawing on narrative transportation theory (Green and Brock, 2002; Green et al., 2004), we argue that users can be transported into their own memories by consuming cultural products, prompting them to share their stories. We conceptualize autobiographical narratives in user comments as collective storytelling. This study applies narrative transportation theory to disseminate popular songs on music streaming platforms. These platforms are music providers and social spaces where users express themselves by writing comments. These comments provide additional information and perspectives, creating a virtual world—a computer-mediated narrative world of collective storytelling (Oh and Choeh, 2021; Zhou et al., 2018).

This virtual world of collective storytelling is built not only on the music content but also on the users' autobiographical memories embedded in their comments. It forms a networked public sphere where people share emotions and memories triggered by the cultural product and other user comments (Papacharissi, 2002; Papacharissi et al., 2017). Collective storytelling is a form of nostalgia—a sentimental longing for the past, often accompanied by a mix of happiness, longing, and sometimes sadness. Such emotions, manifested through comments, amplify the influence of cultural products on these platforms. We argue that collective storytelling contributes to cultural products' popularity and positive ratings. Audience involvement in a cultural product is influenced not only by its popularity but also by how users elaborate on it based on their emotions and the narrative world (Green and Brock, 2002; Green et al., 2004; McQueen et al., 2011). Thus, cultural products' influence is shaped by the product's features and the users' reflections.

Our empirical case is from NetEase Cloud Music, one of the largest and most popular music streaming platforms in mainland China. Similar to Spotify, it offers a vast library of music but also allows users to leave comments, akin to SoundCloud or YouTube audio channels. Users actively engage in social listening practices, making our investigation into narrative transportation within user-generated content relevant. Our findings enrich narrative transportation theories and highlight the importance of user comments in enhancing the influence of cultural products in the digital networked public sphere.

## Theoretical framework

Digital cultural products, such as news articles, videos, songs, and movies, compete for market share and public attention. The influence of these products is reflected in how they shape users' experiences and drive their actions. In this context, the impact of cultural products can be measured by aggregate user responses (Walther and Jang, 2012). On the one hand, various metrics of user engagement have been employed in related studies. For instance, Figueiredo et al. (2011), Szabo and Huberman (2010), and Kupavskii et al. (2013) used the number of views and shares to gauge the popularity of videos on sharing platforms. On the other hand, user evaluations, such as audience ratings on social media platforms, provide valuable insights into the reception of cultural products.

The source-level and message-level factors can affect the influence of cultural products. The preferential attachment framework explains that a small group of elite communicators are more influential than other ordinary users (Barabási and Albert, 1999). Salganik et al. (2006) showed that in an environment where people can see the popularity ranking of songs, the initial popularity could greatly affect the final download volume, compared with the quality of the song itself. The popularity ranking serves as the information cue that persuades people to follow the crowd and jump onto the bandwagon of collective gatekeeping (Wang and Zhu, 2019).

Prior research has documented how message features influence the impact of cultural products. For example, Agarwal et al. (2008) argue that the perceived quality of blog articles affects their impact. Similarly, Park et al. (2007) show that the quality of online reviews can increase consumers' purchasing intention. Specifically, the low-involvement consumers are primarily influenced by the number of reviews, while the high-involvement consumers are mainly influenced by the quality of reviews (Park, Lee, Han, 2007).

Following this logic, we consider the features of artists and songs. Artist features can be seen as source-level factors, whereas song features are content-level factors. It is reasonable to argue that more productive artists, such as those with more albums, will have more popular cultural products. Digital experiments on platforms like Kickstarter, Epinion, Wikipedia, and Change.org have shown that success can breed success, creating a cumulative advantage (van de Rijt et al., 2014). Wang and Wang (2014) found that prior collective ratings can influence subsequent individual ratings on Amazon for music, movies, TV, and books. This pattern also exists in online news diffusion (Wang, 2017). Similarly, an artist's type and a song's attributes can affect the popularity of cultural products. Recent large-scale field experiments have shown that identity cues can effectively influence up-votes and replies to comments (Taylor et al., 2023). Additionally, the musical features of songs can predict their positions on the Billboard Hot 100 Charts (Askin and Mauskapf, 2017).

Building on narrative transportation theory, the present study focuses on the content—specifically the topics and emotions—of user comments on music streaming platforms and examines their impact on the popularity of music products. While most existing research primarily considers the features of cultural products, this study addresses the gap by exploring the role of user comments in music transportation on social media, particularly music streaming platforms. Thomas and Grigsby (2024) conducted a systematic literature review on narrative transportation, identifying its antecedents and their effects. Their review indicates that narrative transportation theory remains valid, especially as a persuasion mechanism. Additionally, Thomas and Grigsby (2024) demonstrate that narrative transportation theory has evolved: earlier research focused on the relationship between storyteller/

consumer characteristics and narrative transportation, while current research examines the effects of medium characteristics. For instance, Seo et al. (2018) found that narrative transportation positively influences viral advertising, moderated by paratextual features of social networking service environments. The effect was stronger when the sender and receiver had personal connections, suggesting that narrative engagement can foster social sharing behaviors. This study aims to enrich these findings by exploring how user comments on music streaming platforms contribute to narrative transportation and, consequently, the popularity of music products.

**User comments as narrators.** Less scholarly attention has been paid to the role of user comments in online communities in promoting the cultural products' impacts. User comments play a vital role in the sense-making of cultural products on online platforms. Although some studies found that user comments may be short, meaningless, and episodic (Ishizaki et al., 2013), other studies found that in mainstream music commenting communities, most comments involve the deep elaboration of music. Scholars have examined the content of the user comments. Meng (2015) measured the popularity of comments with the number of likes on NetEase Cloud Music. Half of the top 50 popular comments in the sample praise the song, the singer, or the lyrics, and some comments discuss the users' status. The extent to which these elaborated comments influence the songs warrants more studies. According to the popularity cues or bandwagon heuristics (Wang, 2017), the user comments with more likes indicate a higher level of involvement and perceived quality.

**Narrative themes of user comments.** Green and Brock (2000) proposed the narrative transportation theory to study the mechanism of users' sense-making and consumption of the products. "Transportation" means "the emotional reactions, mental imagery, and loss of access to real-world information" (Green and Brock, 2000, p. 703). Narrative transportation triggers cognitive and affective responses that lead to long-term consequences concerning changes in attitude and intention (Kim et al., 2016; Van Laer et al., 2014). As an important form of narrative, popular music can effectively evoke various emotions and autobiographical memories (Janata et al., 2007).

Music streaming services provide a social networking platform where users can connect with each other, post, and reply to comments under each song (Zhou et al., 2018). Research on social streaming services has examined how user comments influence music products' popularity. For example, Oh and Choeh (2021) analyzed 2896 music videos uploaded between 2016 and 2019 by 105 artists who owned YouTube's official channels. They found that videos integrating visual, performance, and storytelling components had more positive viewer engagement, but audio-only videos generated lower overall engagement intensity (Oh and Choeh, 2021).

Cultural products reinforce their influence by activating users' engagement, such as commenting or liking. The user comments reveal users' mental images and beliefs. Prior research argues that user comments are regarded as a "cue to public opinion and reliable testimony when they are believed to come directly from 'real' citizens and 'real' customers" (Lee, 2020, p. 62). Thus, user comments can influence audiences' perception of the content using the peripheral route or heuristic approach. Yet, related studies have focused extensively on news usage (Ksiazek et al., 2015; Sohn et al., 2019; Reimer et al., 2023) and video streaming services (Rauchfleisch and Kaiser, 2020; Welbourne and Grant, 2016). We argue that user comments have more critical functions than merely acting as information cues or mental shortcuts: user

comments as narration can transport people into their memories. The content of user comments often includes topics such as love, growth, and life, which are derived from daily life and conform to their psychological traits. Thus, the narrative of user comments can arouse emotional resonance among users—where resonance can be understood as the empathy-driven by shared collective memory—which generates heated discussion, connectedness, mutual support, and self-identity (Hertz, 1990; Mills and Coleman, 1994; Wilson, 1999). Consequently, users are much more deeply immersed in the narrative world. Thus, we propose the hypothesis as follows:

*H1: The amount of narrative theme contained in a song's aggregated user comments is positively associated with its (a) user engagement and (b) perceived quality.*

**Emotional framing of user comments.** The influence of emotion on the popularity of cultural products holds important theoretical and practical implications. Emotion, in this context, refers to the ability of information to elicit emotional arousal. The role of emotion has long been a critical topic in communication research. Emotion-laden information is more effective at capturing users' attention and prompting behavioral responses (Chandy et al., 2001; Holbrook and Batra, 1987). Previous studies indicate that both positive and negative emotions in information can generate increased attention, feedback, and engagement (Huffaker, 2010).

Prior research on news consumption emphasizes that negative emotions promote communication (Huffaker, 2010). In online platforms, Thelwall et al. (2012) found that tweets with negative emotions are more likely to be retweeted. Similarly, Wu and Shen (2015) found that the negative emotion in news was directly related to its retweet rate on Sina Weibo, while the positive emotion only had a minor effect. On the contrary, several studies found that positive emotions are more effective in promoting audience engagement. For example, Berger and Milkman (2010) performed a sentiment analysis of 6956 articles in the New York Times and found a strong association between positive emotion and whether an article is shared. The impact of positive emotions could be explained by the positivity bias which asserts that most people tend to report positive views of reality (Hoorens, 2014).

Listening to music not only provides auditory pleasure but also triggers emotional expression and engagement from the audience (Appel, 2022; Scherer et al., 2001; Stratton and Zalanowski, 1994; Tacchi, 2003). For instance, Appel (2022) shows that stories can cause affective resistance, reducing the impact of the narrative. In online music communities, user comments imbued with personal emotions and stories transform songs into a collective symphony created by the community (Batcho et al., 2008). Users can interact with these comments by liking or replying, turning solitary music listening into an interactive experience with virtual groups sharing similar emotions. Based on the above review, we propose the following hypothesis:

*H2: The strength of emotions in a song's aggregated user comments is positively associated with (a) its user engagement and (b) its perceived quality.*

According to the seminal research by DeSteno et al. (2004), aligning the emotional framing of a message with the receiver's emotional state fosters the development of a positive attitude (Joyal-Desmarais et al., 2020; Teeny et al., 2021). When a message resonates emotionally with the receiver, persuasion becomes more effective. This concept has evolved into what is now known as personalized matching—also referred to as tailoring, targeting, customizing, or personalizing (Teeny et al., 2021). Teeny et al. (2021) provide a comprehensive review of various types of personal matching, including affective matching between message senders and receivers. Additionally, Joyal-Desmarais et al. (2020)

introduce the concept of matching thresholds, which identifies the critical point along a continuum where individuals shift from being most responsive to one type of message to another.

Thus, emotional framing could lead to favorable attitudes. When the users of music streaming services choose to listen to a song, they also match their inner emotions with the emotional framing of the song. We contend that the matching logic also holds for the relationship between user comments and music. When the emotional framing and narrative themes of the user comments match the content of the song, the impact of the song's content on its popularity and perceived quality will be amplified. On the contrary, the impact of the song's content on its popularity and perceived quality will be reduced. Thus, we propose the following hypothesis:

*H3: The impact of the song's content on its (a) user engagement and (b) perceived quality is moderated by the emotional framing and narrative themes of its user comments.*

## Methods

The present study focuses on NetEase Music, one of the largest and most popular music streaming platforms in mainland China, which has 300 million users and over 10 million songs (NetEase Cloud Music, 2022). We collected data from the web version of NetEase Cloud Music via a Python crawler compiled by the research team. We collected data in the sequence of singers, albums, songs, and comments. First, we gathered the singer data on NetEase Cloud Music from its dedicated singer pages (<https://music.163.com/#/discover/artist/>). Singers are categorized by language type into five categories: Chinese, Japanese, Korean, Western, and Others. In this study, we focused on Chinese singers. We divided all the singers into three types: male singers, female singers, and groups or bands. Second, based on the information on the singer's page, we scraped all the albums by the singer. Third, based on the album information, we obtained the page information for each song in the album. Finally, we collected the comment information for each song.

Since the primary target users of NetEase Cloud Music are mainly the audience for Chinese songs, our study only focuses on Chinese singers. The dataset contains all the "top comments" under all Chinese pop songs on the platform. It includes 7470 popular Chinese singers (including male singers, female singers, and bands, with a total of 137,546 albums and 478,864 songs). The features of the songs include the name of the artist, album, album release time, lyrics, and other data information of each song. To be specific, the present study focuses on two factors of music products, namely (1) the music products' features (e.g., the artists' attributes, the songs' characteristics) and (2) the comments' features (e.g., the topics and emotions of the comments).

For each song, we collected the top-rated comments on the homepage of the song. The top-rated comments are presented under the main page of the song in descending order according to the number of likes. Each song can display up to 15 top-rated comments, with a total of 1.31 million collected under 187,678 songs. For each comment, we collected the comment text, comment time, the number of likes for the comment, the commenter's user information (e.g., user ID), and the total number of comments on the song. Based on the user ID, we collected the personal information of the commenting user, including user nickname, gender, personal signature, registration date, age, region, user type, platform level, membership type, number of songs listened to, number of updates, number of fans, the number of followers, and the number of subscribed playlists.

The project team considered the ethics of collecting and analyzing digital data carefully. All the information collected in the present study is publicly available and do not contain any

personal information that would disclose the identity of the users' personal information. All the data was stored in password-protected devices and only the authors could access the files. In reporting the data, we only reported the aggregated data, and no individual-level data would be reported.

We cleaned the text data following the procedures outlined below: First, we removed punctuation, numbers, URLs, and other non-Chinese characters from the digital comments. Second, for natural language processing purposes, we further removed the stop words. Third, we segmented the Chinese words using the Jieba Python package (<https://pypi.org/project/jieba/>). Jieba employs a pre-build dictionary for word segmentation and incorporates a character-based Hidden Markov Model to handle cases where dictionary-based matching fails, particularly for unknown words or new words not present in the dictionary.

**Dependent variable: user engagement.** We measured the user engagement of a song using the number of comments it received. The minimum value of the number of comments is 1 and the maximum value is 2538842. Because the number of comments is highly skewed ( $M = 185.556$ ,  $SD = 1581.595$ ), we transform this variable into its logarithmic form (using Euler's number  $e$  as the base) to normalize its distribution ( $M = 5.881$ ,  $SD = 1.688$ ). The logged value of the number of comments ranges from 0 to 14.747.

**Dependent variable: perceived quality.** We measured the perceived quality ( $M = 49.980$ ,  $SD = 32.491$ ) of the song using the score officially supplied by NetEase Music. This score is calculated by the platform and captures the users' rating of the song, which is similar to the ratings in content-based social media like IMDB and Netflix. Admittedly this score was maintained by the platform, we believe it is currently the best and meaningful indicator of a song's perceived quality. The minimum value of perceived quality is 5 and the maximum value is 100. We transform this variable into its logarithmic form (using Euler's number  $e$  as the base) to normalize its distribution ( $M = 3.634$ ,  $SD = 0.810$ ). After transformation, the minimum value is 1.609 and the maximum value is 4.605.

**Predictor: The number of likes.** The number of likes is invoked by the content of the user comments and it reflects how much people like it. In other words, it also measures the degree to which users interact with each other for a song. Thus, we included the number of likes ( $M = 759.359$ ,  $SD = 5184.705$ ) as a control variable. It ranges from 10 to 414933. Since the distribution is highly skewed, transform this variable into its logarithmic form (using Euler's number  $e$  as the base) to normalize its distribution ( $M = 4.784$ ,  $SD = 1.631$ ). The minimum value of the number of likes (log) is 2.302 and the maximum value is 12.936.

**Predictor: Emotion framing.** We distinguished the sentiment polarity and concrete emotional types as two dimensions of emotion framing. We measured the sentiment polarity and specific emotional types in both lyrics and comments. The emotional polarity measures to what extent the text is positive or negative. We used the Python package of bosonnlp (<https://pypi.org/project/bosonnlp/>) to calculate the sentiment polarity. Given a text, bosonnlp can return its probability of positive emotion and the probability of negative emotion. Since the sum of two probabilities equals one, we only report the negative polarity for the lyric ( $M = -31.795$ ,  $SD = 22.151$ ) and the comments ( $M = 3.384$ ,  $SD = 2.445$ ).

We measured concrete emotional types using the Chinese Emotional Vocabulary Ontology database (<http://ir.dlut.edu.cn/index.htm>) developed by the Dalian University of Technology.

Ekman (1992) identified six basic emotions: anger, disgust, fear, happiness, sadness, and surprise. Following Ekman’s approach, Xu and his colleagues at Dalian University of Technology construct the Chinese version of Emotional Vocabulary Ontology (Xu et al., 2008). Following the seminal work of Plutchik (2001), Xu et al. (2008) expand the number of basic emotions from six to seven by adding the emotion category “love”. Thus, we measured seven basic emotions for both the lyrics and user comments (Ekman, 1992; Xu et al., 2008).

**Predictor: Topics.** We employed topic models to capture the topics of lyrics and user comments. We used the Python package Gensim to discover the topics following the Latent Dirichlet allocation (LDA) method (Blei et al., 2003). We calculated the perplexity scores for the topic models with different topic numbers and selected five as the optimal topic number (Blei et al., 2003).

The five topics for the comments were summarized as follows: topic 1 expressing feelings about music ( $M = 0.491$ ,  $SD = 0.310$ ), topic 2 expressing views on relevant films and TV dramas ( $M = 0.503$ ,  $SD = 0.312$ ), topic 3 evaluating the creation of songs ( $M = 0.495$ ,  $SD = 0.310$ ), topic 4 evaluating the performance of singer(s) ( $M = 0.498$ ,  $SD = 0.310$ ), and topic 5 nostalgia ( $M = 0.516$ ,  $SD = 0.312$ ).

Similarly, we have also summarized the five topics for the lyrics of songs, including topic 1 the pursuit of the ideal life ( $M = 0.059$ ,  $SD = 0.235$ ), topic 2 nostalgia ( $M = 0.262$ ,  $SD = 0.440$ ), topic 3 gratitude to family and friends ( $M = 0.185$ ,  $SD = 0.388$ ), topic 4 emotional expression of love and lovers ( $M = 0.039$ ,  $SD = 0.193$ ), and topic 5 an ode to the world of martial arts ( $M = 0.164$ ,  $SD = 0.370$ ).

**Control variable: Singer type.** According to the gender and the number of members, the type of Chinese singers can be classified into three categories: the Chinese male singer ( $N = 43721$ , 38.6%), the Chinese female singer ( $N = 38205$ , 33.8%), and the Chinese band ( $N = 31185$ , 27.6%).

**Control variable: Album number.** Another essential feature of the singer is the number of albums he or she published. It measures how active the singers have been in the past years. Because the number of comments is highly skewed, we take its logarithmic form ( $M = 3.478$ ,  $SD = 1.090$ ) to normalize its distribution.

**Data analysis procedures.** Our data analysis proceeded through several steps. First, since the unit of analysis was the song, we aggregated the information from the singer, song, and comments to the song level. Second, we performed sentiment analysis to assess the sentiment polarity and the seven basic emotions. Third, we applied topic modeling to identify the themes present in both the lyrics and user comments. Finally, we constructed fixed-effect regression models to examine the influence at the singer level, test our hypotheses, and report our findings.

**Results**

**Descriptive statistics of the variables.** Prior to formally testing the research hypotheses, we initiate our analysis by reporting the descriptive findings. Table 1 reports the descriptive statistics of the variables.

Our focus is on the comments. In terms of the topics of the comments, there is nostalgia, expressing feelings about music, and evaluations related to songs or singer performances. These variables are around a mean of 0.5 with a standard deviation of 0.31, which suggests that users engage with these themes at

**Table 1 The descriptive statistics of the variables.**

Variables	Mean	SD
<i>Dependent variables</i>		
• User Engagement	5.9	1.7
• Music Quality	3.6	0.81
<i>Independent variables</i>		
• Comments’ Topic: Nostalgia (NoC)	0.52	0.31
• Comments’ Topic: Expressing the feelings about music	0.49	0.31
• Comments’ Topic: Expressing views on relevant films and TV dramas	0.5	0.31
• Comments’ Topic: Evaluating the creation of songs	0.5	0.31
• Comments’ Topic: Evaluating the performance of singer(s)	0.5	0.31
• Negative Polarity of Comments (NeC)	3.4	2.4
• Comments’ Emotion: Love	0.41	0.31
• Comments’ Emotion: Happiness	0.022	0.092
• Comments’ Emotion: Sadness (SaC)	0.046	0.13
• Comments’ Emotion: Anger	0.0011	0.019
• Comments’ Emotion: Fear	0.012	0.065
• Comments’ Emotion: Disgust	0.12	0.19
• Comments’ Emotion: Surprise	0.0023	0.026
• Lyrics’ content: Nostalgia (NoL)	0.26	0.44
• Lyrics’ content: Negative Polarity (NeL)	-32	22
• Lyrics’ content: Sadness (SaL)	3.6	3.9
<i>Control variables</i>		
• Album Number (log)	3.5	1.1
• Likes Number (log)	4.8	1.6

similar levels. In terms of the emotion of the comments, there is a broader range of variability. Positive emotions include happiness (mean = 0.022,  $SD = 0.092$ ) and surprise (mean = 0.0023,  $SD = 0.026$ ), which are at a lower level, suggesting that positive or surprising comments are rare. Love (mean = 0.41,  $SD = 0.31$ ) is more prevalent than other emotions such as sadness (mean = 0.046,  $SD = 0.13$ ) and disgust (mean = 0.12,  $SD = 0.19$ ). Negative emotions like anger (mean = 0.0011,  $SD = 0.019$ ) and fear (mean = 0.012,  $SD = 0.065$ ) are less likely to occur.

Using the band as the baseline of comparison, we find that (see Table 2 for detailed information) the male singers can invoke more user engagement ( $B = 0.144$ ,  $p < 0.01$ ) and better music quality ( $B = 0.220$ ,  $p < 0.01$ ) than the band. Surprisingly, we find that artists with more albums have fewer user comments than artists with fewer albums ( $B = -0.039$ ,  $p < 0.01$ ). Similarly, we find that artists with more albums also have a negative impact on the evaluation of music quality ( $B = -0.059$ ,  $p < 0.01$ ). Further, we examine the effects of the music. The number of likes of a song’s comments measures to what degree people like a song’s user comments. The results of Model 2 and Model 4 in Table 1 support that the number of likes has a strong and positive impact on user engagement ( $B = 0.896$ ,  $p < 0.01$ ) and the evaluation of music quality ( $B = 0.284$ ,  $p < 0.01$ ).

To what extent will the song’s features affect user engagement and music quality? As Table 1 demonstrates, both the emotion and the topics of lyrics have a significant impact. Specifically, the lyric’s negative polarity has a negative impact on user engagement ( $B = 0.001$ ,  $p < 0.01$ ). In contrast, it has a positive effect on the evaluation of music quality ( $B = 0.0004$ ,  $p < 0.01$ ). The sadness emotion in lyrics has a consistent positive impact on both user engagement ( $B = 0.001$ ,  $p < 0.01$ ) and music quality ( $B = 0.005$ ,  $p < 0.01$ ). The nostalgia in lyrics also has a positive impact on both user engagement ( $B = 0.027$ ,  $p < 0.01$ ) and music quality ( $B = 0.020$ ,  $p < 0.01$ ).

**Table 2 Linear mixed-effect models of user engagement and music quality.**

	User engagement		Music quality	
	Model 1	Model 2	Model 3	Model 4
Album Number (log)	-0.039*** (0.006)	-0.039*** (0.005)	-0.059*** (0.006)	-0.059*** (0.006)
Likes Number (log)	0.898*** (0.001)	0.896*** (0.001)	0.285*** (0.001)	0.284*** (0.001)
Male (vs. Band)	0.144*** (0.015)	0.144*** (0.015)	0.220*** (0.015)	0.220*** (0.015)
Female (vs. Band)	-0.020 (0.015)	-0.020 (0.015)	0.128*** (0.015)	0.128*** (0.015)
Nostalgia of Comments (NoC)	0.017*** (0.007)	0.093*** (0.012)	0.019*** (0.006)	0.076*** (0.011)
Expressing the feelings about music	-0.002 (0.006)	0.0004 (0.006)	-0.014** (0.006)	-0.012** (0.006)
Expressing views on relevant films and TV dramas	0.017*** (0.007)	0.014** (0.007)	-0.013** (0.006)	-0.015*** (0.006)
Evaluating the creation of songs	0.004 (0.006)	0.006 (0.006)	0.004 (0.006)	0.006 (0.006)
Evaluating the performance of singer(s)	0.018*** (0.006)	0.020*** (0.006)	-0.004 (0.006)	-0.002 (0.006)
Negative Polarity of Comments (NeC)	0.005*** (0.001)	0.024*** (0.001)	0.004*** (0.001)	0.018*** (0.001)
Love of Comments	0.040*** (0.007)	0.036*** (0.007)	0.012** (0.006)	0.009 (0.006)
Happiness of Comments	0.008 (0.021)	0.008 (0.021)	-0.019 (0.018)	-0.019 (0.018)
Sadness of Comments (SaC)	0.042** (0.015)	0.015 (0.018)	0.040*** (0.013)	0.029* (0.016)
Anger of Comments	0.202** (0.101)	0.189* (0.101)	0.307*** (0.089)	0.298*** (0.089)
Fear of Comments	-0.042 (0.029)	-0.048 (0.029)	-0.061** (0.026)	-0.065** (0.026)
Disgust of Comments	0.018* (0.011)	0.013 (0.011)	0.033*** (0.009)	0.030*** (0.009)
Surprise of Comments	0.118* (0.071)	0.115 (0.070)	0.151** (0.062)	0.148** (0.062)
Nostalgia of Lyrics (NoL)	0.047** (0.005)	0.027** (0.009)	0.026** (0.004)	0.020** (0.008)
Negative Polarity of Lyrics (NeL)	-0.001*** (0.0001)	-0.001*** (0.0002)	0.0002** (0.0001)	0.0004*** (0.0002)
Sadness of Lyrics (SaL)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.0005)	0.005*** (0.0005)
NoC*NoL		0.030** (0.014)		0.008 (0.012)
SaC*NoL		0.071** (0.031)		0.024 (0.028)
NoC*NeC		-0.033*** (0.002)		-0.024*** (0.002)
NoC*NeL		-0.001* (0.0003)		-0.0005* (0.0002)
Constant	1.548***	1.516***	2.329***	2.305***
Marginal R <sup>2</sup>	0.812	0.813	0.351	0.352
Conditional R <sup>2</sup>	0.861	0.861	0.578	0.579

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.001$ .

In terms of the user comments, we found that user comments play a crucial role in triggering more user engagement. As hypothesized, the presence of autobiographical transportation elements—the nostalgic narrative topic (topic 5)—in the comments is positively associated with user comments ( $B = 0.093$ ,  $p < 0.01$ ); together with topic on films or TV dramas original soundtracks ( $B = 0.014$ ,  $p < 0.05$ ) and some comments on the performance of the singers ( $B = 0.020$ ,  $p < 0.01$ ). Similarly, the

nostalgia ( $B = 0.076$ ,  $p < 0.01$ ) in comments can also improve the evaluation of music quality. In addition, expressing feelings about the music ( $B = -0.012$ ,  $p < 0.01$ ) or expressing views on related films and TV dramas ( $B = -0.015$ ,  $p < 0.01$ ) have a negative impact on the evaluation of music quality. Thus, H1 is supported by our findings.

To test H2, we examine how comments' emotions influence user engagement and music quality in Table 1. Negative emotional comments will generate more user comments ( $B = 0.024$ ,  $p < 0.01$ ) and higher music quality. The emotion of love ( $B = 0.036$ ,  $p < 0.01$ ) and anger in comments ( $B = 0.189$ ,  $p < 0.1$ ) can trigger more user comments. The emotion of sadness ( $B = 0.029$ ,  $p < 0.1$ ), anger ( $B = 0.298$ ,  $p < 0.01$ ), disgust ( $B = 0.030$ ,  $p < 0.01$ ), and surprise ( $B = 0.148$ ,  $p < 0.05$ ) in comments can improve the evaluation of music quality. Further, the emotion of fear ( $B = -0.065$ ,  $p < 0.05$ ) in comments has a negative impact on music quality. Thus, H2 is supported.

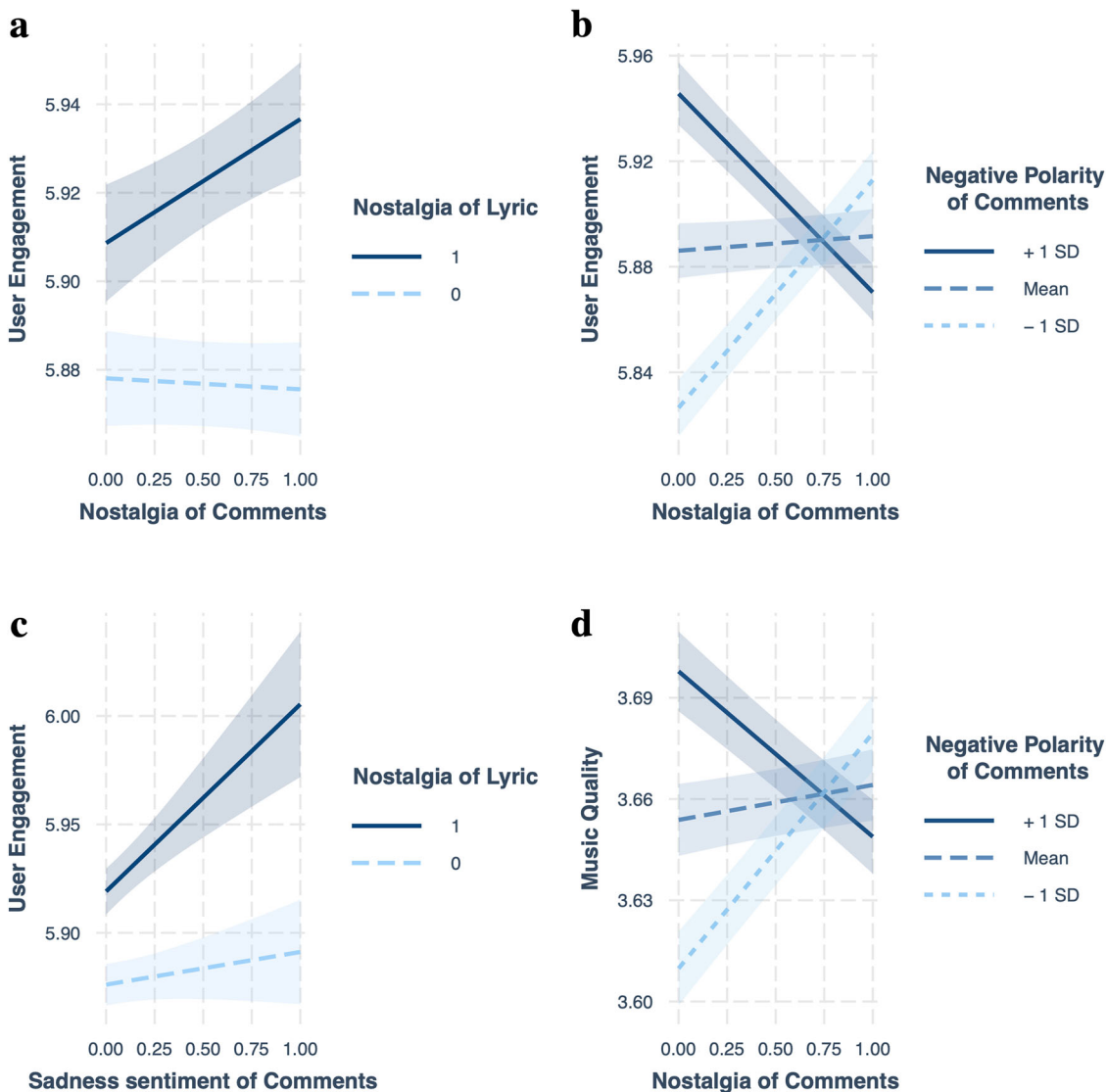
We have also examined the moderation effects in Table 1. As shown in Fig. 1a, the impact of autobiographical transportation in the comments on user engagement is moderated by the nostalgia of lyrics ( $B = 0.030$ ,  $p < 0.05$ ) and negative polarity in comments ( $B = -0.033$ ,  $p < 0.01$ ). In addition, the impact of the sadness emotion of the comments on user engagement is moderated by the nostalgia of lyrics ( $B = 0.071$ ,  $p < 0.05$ ). Finally, as Fig. 1d shows, the impact of nostalgia of comments on music quality is moderated by the negative polarity of comments ( $B = -0.024$ ,  $p < 0.01$ ). Therefore, H3 is partly supported.

**Discussion and conclusion**

The present study explores how music content and user comments—two integral components of cultural content on social media—jointly impact a product's influence on music streaming platforms. By enriching narrative transportation theory, we investigate the role of user comments and their implications on social media. Using computational methods (text mining) and large-scale digital data (artists and album information, lyrics text data, and user comment data) harvested from NetEase Cloud Music, one of the largest and most famous music streaming platforms in mainland China, the present study finds that the user comments, particularly those conveying emotions and autobiographical memories, heightens the songs' influence, i.e., triggering more active user engagement and audience rating. Our findings also contribute to the existing literature by shifting the focus from Western-dominated platforms to prominent music streaming platforms in mainland China. We elaborate on the foremost findings and implications below.

First, our study confirms that both source-level factors (such as artist characteristics) and content-level factors (such as song attributes) align with similar findings observed in news and public domains (Davies, 2002; Park et al., 2007). For instance, well-established elite singers have greater influence, and male singers tend to be more popular than their female and band counterparts. This observation reflects a broader trend in the music industry, characterized by the Matthew effect and notable gender inequality. Our results echo Anglada-Tort et al. (2021), who found that male musicians dominated the UK weekly top five sales charts from 1960 to 2015. Additionally, our study suggests the role of identity cues in enhancing public engagement with cultural products, supporting findings by Taylor et al. (2023).

Our study advances the narrative transportation theory by applying it to the context of social media and music streaming platforms, where users not only passively listen to songs but also actively engage by commenting as the post-consumption practice. This research underscores the importance of user comments—



**Fig. 1 The interaction effects.** **a** The interaction between the nostalgia of comments and nostalgia of lyrics. **b** The interaction between the nostalgia of comments and the negative polarity of user comments. **c** The interaction between the sadness emotion of comments and the nostalgia of lyrics. **d** The interaction between the nostalgia of comments and the negative polarity of comments.

both their emotional content and thematic elements—in shaping the influence of cultural products (Ksiazek, 2018; Krebs and Lischka, 2019; Lee et al., 2021). While previous studies have primarily viewed user comments as social cues or endorsements (Lee et al., 2021) and investigated their impact through peer influence (Ballantine et al., 2015; Bond et al., 2012), our study focuses on the implications of comment content, precisely emotions and themes. We find that user comments with negative emotions and personal, autobiographical nostalgia have the most profound effect on driving user engagement and music ratings. This finding aligns with previous research indicating that emotional and nostalgic elements can significantly impact audience responses (Janata et al., 2007). Remarkably, the role of autobiographical memories mirrors patterns observed in other creative works, such as films. Wasserman et al. (2015) discovered that films referencing works from 25 years ago have a greater impact due to their resonance with long-standing audience memories. Our study extends this concept to social media platforms, highlighting how detailed user comments enhance the influence of cultural products by tapping into collective memories and emotional connections.

Second, a noteworthy finding of our study is that user comments have a more substantial impact on less established artists—those with fewer albums or limited resources. It suggests that a cultural product’s influence largely depends on the audience of social media. Such two-way communication processes from the audiences put the cultural products into a “constantly updated public account of experiences, interests, and opinions” that are “reinterpreted, reassembled, and recycled” (Park and Kaye, 2019, p. 2). Our results align with the concept of an active audience on social media (Palomo et al., 2019; Schmidt et al., 2022), where audiences engage in post-consumption interactions and meaning-making rather than simply accepting the media’s pre-established fame and market value. Consequently, lesser-known artists can make notable strides if they successfully engage their audience, potentially competing with more prominent stars.

Our findings also resonate with the idea of collective wisdom (Surowiecki, 2005) and its impact on the social influence of cultural products (Soffer and Gordoni, 2020; Steinger and Gatzemeier, 2019). The popularity and reach of cultural products are shaped not only by the artists or the inherent features of the products but also by the active engagement of ordinary users.



These users contribute by elaborating, re-broadcasting, and reinterpreting the original content, thereby playing a crucial role in amplifying its impact.

When user comments have become an integrated part of online content, our study contributes to social media research by highlighting the role of alternative media discourse and its social implications. We observed that music streaming platforms are evolving beyond mere tools for listening to music, transforming into spaces for sharing and exchanging information, opinions, and personal stories. Music streaming social media may act as a counter-public sphere in a huge cultural market with diverse cultural values and vibrant and active online users like mainland China (Downey and Fenton, 2003). Downey and Fenton (2003, p. 194) explain that a counter-public sphere is “a specifically modern phenomenon, contemporaneous with, and responding to, dominant capitalist communications,” which depicts the alternative communicative and media practices for non-mainstream expressions. The entertainment usage of social media is an extended expression of personal discourse (Denisova and Herasimenka, 2019; Gong and Yang, 2010).

**Limitations and future research directions.** The present study has several limitations that highlight directions for future research. First, our analysis is limited to NetEase Music, one of the largest music streaming platforms in mainland China known for its extensive user comments. Although this platform’s unique features justify our research focus, this narrow scope overlooks the diversity of user engagement across other music platforms where people can still enjoy the music products and share comments. Future research could broaden this perspective by conducting comparative studies across multiple platforms. Second, we do not consider the musical attributes of the songs, such as pitch, tone, and rhythm. Admittedly, technical constraints prevented us from collecting and analyzing extensive audio data, but our detailed textual analysis of user comments still contributes to the narrative transportation framework as we regard user comments as an integral part of storytelling. Future studies should examine these audio features to deepen the understanding of how they influence user interactions. Thirdly, focusing on user comments inherently biases our data towards online users, especially those willing to share detailed personal stories. This approach may not fully capture the broader spectrum of user engagement. To address this, future research should include a more diverse range of data sources, such as user studies like surveys or interviews, to offer a more comprehensive view of user’s meaning-making during their consumption of cultural products (Cui and Zhang, 2017). Lastly, our study is confined to Chinese songs. Exploring user engagement with foreign songs could provide valuable insights into the international flow of cultural products within the music industry. Future studies should investigate how engagement with foreign music compares to domestic music, considering the role of cross-cultural dynamics.

**Conclusion.** This study enhances the narrative transportation theory by exploring how cultural products influence social media interactions, specifically through user comments and engagement with songs on a major music streaming platform in mainland China. Employing text mining techniques to analyze the themes and emotions embedded in user comments, we discovered that autobiographical narratives and negative emotions amplify a song’s impact, leading to increased likes and comments. This finding argues that when people listen to music, they are not only engaging with the musical experience but also reflecting on their personal stories. Furthermore, our results highlight that user comments have a more pronounced effect on less established

artists, suggesting that music streaming platforms act as filters, elevating the most compelling user interactions through collective gatekeeping. This dynamic allows the mental images and emotions crystallized in user comments to resonate more deeply and enhance the cultural product’s influence. Our study contributes to the concept of collective wisdom by illustrating how cultural products gain local influence through their ability to evoke users’ emotions and memories. In the networked digital public sphere, the impact of cultural products is driven by users’ narrative transportation, making the listening experience a rich tapestry of personal and shared stories. When engaging with music on streaming platforms, people are not merely hearing the music itself but also the voices and stories of others.

### Data availability

The dataset and code employed in this study are available on Open Science Framework <https://doi.org/10.17605/OSF.IO/MTASG>.

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### Author contributions

CW conceived the study, analyzed the data, wrote and revised the manuscript, and served as the first author. ZG analyzed the data and revised the manuscript. YW analyzed the data and wrote the manuscript. XZ supervised the study, revised the manuscript, wrote the cover letter, and served as the corresponding author.

### Competing interests

The authors declare no competing interests.

### Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

### Informed consent

This article does not contain any studies with human participants performed by any of the authors.

### Additional information

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