

The Impact of Short-Video Platform Algorithms on Social Aesthetics and Public Cognition

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Abstract:

In today's digital age, short-video platforms have become the dominant force in online consumption. With the seamless integration of technology and entertainment, they have attracted billions of users worldwide. The rapid growth in the number of these platforms is attributed to the complex algorithms that support content recommendation systems, which effectively customize user experiences based on individual preferences. However, this technological advancement raises profound questions about its broader impact on public perception and social aesthetics. This study investigates how public cognition and social aesthetics are affected by algorithms used by short-video platforms. To examine the standardization process of algorithmic aesthetics and the cognitive reshaping effect of immersive media design, it employs content analysis techniques and blends interdisciplinary ideas of communication studies, computer science, and cognitive psychology. According to studies, the platform's recommendation algorithm, which was developed using collaborative filtering and deep learning, homogenizes aesthetic preferences with the aid of a "tag system" and "imitation learning" mechanisms. In contrast, features like auto-play and infinite scrolling cause users' attention to become fragmented and rely on the algorithm. In the meantime, algorithmic traffic distribution exacerbates the cognitive dilemma of the country's broad entertainment trend and marginalizes specific aesthetics.

Keywords: Short-video platforms; Algorithmic aesthetics; Aesthetic homogenization.

1. Introduction

1.1 Research Background

Short-video websites like Douyin and Xiaohongshu have grown rapidly in recent years, which is a phenomenon that strongly represents the “mediatization” tendency in social life. As new “aesthetic agents,” AI-driven content distribution systems are radically altering the cultural production environment in this process [1]. By 2024, there will be over 1 billion users on China’s short-video platforms, with an average daily usage time of more than 2.5 hours, according to pertinent estimates. Every day, platform algorithms process petabytes of user behavior data [2]. This big data and machine learning-based content recommendation engine has developed into a major influence on the aesthetic preferences and thought processes of the general public, going beyond its initial use as a tool for disseminating information [3].

1.2 Research Objectives and Significance

Two main concerns will be investigated in this study: first, algorithms use tailored recommendations to reconstruct aesthetic standards. Second, immersive media design has effects on cognition. In order to close the knowledge gap on how algorithms affect aesthetic mechanisms, the theoretical significance resides in developing a new analytical framework for algorithmic aesthetics research from an interdisciplinary perspective that integrates theories from computer science, cognitive psychology, and communication [4]. The research findings will have practical value as they can serve as a scientific foundation for the development of regulatory policies, public media literacy initiatives, and platform algorithm optimization, all of which will help create a more diversified and healthy online cultural ecology [5].

1.3 Research Methods and Structure

The research framework used in this study is “theoretical deconstruction-empirical measurement,” which integrates several research techniques [6]. The top 1,000 videos on Douyin and Xiaohongshu were chosen as samples for content analysis. We then used the original “Cocoon Index” to quantify content homogeneity and perform visual grammar coding, which includes color application and editing rhythm [7]. In the meantime, we thoroughly investigated the reconstructive path of algorithms on cognitive patterns by fusing the technical study of algorithmic curation mechanisms with user questionnaires [8].

The six components of the research structure—introduction, literature review, research methodology, research

findings, dilemma analysis, and conclusion—follow a strict academic logic. A whole study chain from theoretical underpinnings to empirical analysis, followed by discussion of real-world problems and potential future directions, is guaranteed by this progressive argumentation structure [9].

1.4 Content Analysis

The primary empirical research approach in this work is content analysis [1]. To ensure the timeliness and representativeness of the samples, this study crawled the top 1,000 popular videos from Douyin and Xiaohongshu between January 2023 and June 2024, taking into account metrics like play count and likes.

In order to perform detailed coding of video color patterns (e.g., the frequency of using Morandi and high-saturation colors), editing rhythm (e.g., average shot transition duration, usage times of special effects), narrative templates (e.g., the application proportion of the “pain point first-solution” structure), and other dimensions, this study developed a “visual grammar analysis framework” during the coding system’s construction [7].

In order to measure aesthetic uniformity, this study proposes an innovative ‘Cocoon Index’ framework through multidimensional synthesis.” This index calculates the percentage of recurring visual components in popular material, such as certain filters, background music, and camera movements. Cocoon Index is specifically calculated as follows: $(\text{Number of Repeated Elements} / \text{Total Number of Elements}) \times 100\%$. The level of aesthetic standardization under algorithmic recommendation systems might be intuitively reflected by this metric.

2. Literature Review

2.1 Algorithmic Curation Mechanisms

Deep learning and collaborative filtering are the two main technical pillars of algorithmic curation systems [6]. Using Douyin’s “Recommendations Page” as an example, collaborative filtering algorithms make recommendations for content to target users by analyzing user behavior data from the past to determine the preferences of similar user groups. Deep learning models can automatically learn feature representations from large amounts of data, continuously improving recommendation accuracy [2].

Critically speaking, though, these algorithmic curation techniques can quickly result in information cocooning effects, which in turn cause aesthetic homogeneity [9]. Long-term users of content that suits their tastes progressively create a closed information environment and miss

out on opportunities to experience a variety of aesthetics. According to related research, users who have been using short-video platforms for more than six months have a 40% higher concentration of seen content categories than when they first started using them, and there is a clear convergence tendency in their aesthetic preferences [10].

2.2 Characteristics of Immersive Media

Inducing a dopamine-driven “flow state” in users is a key component of immersive media design [11]. According to neuroscientific studies, the autoplay features of platforms promote dopamine release by stimulating the brain’s reward circuit. The brain goes into a highly focused and enjoyable condition known as the “flow state” when people watch engaging videos on a regular basis. Users’ perception of time is warped in this state, and their focus is constantly fixed on the screen [12].

According to an fMRI-based study, users’ brain activity in the prefrontal cortex, which is in charge of decision-making and self-control, dropped by 28% while the nucleus accumbens, a region linked to reward processing, increased by 35% when they watched short videos [13]. Because of this brain mechanism, users of short-video platforms are more likely to develop cognitive disorders like “time fragmentation” and “algorithmic dependency” [14].

3. Research Findings

3.1 Algorithmic Standardization of Aesthetics

According to the study, user profile aestheticization and imitation learning mechanisms are how short-video platforms accomplish algorithmic uniformity of aesthetics [15,16]. In addition to being tools for classifying material, platform label systems like “Y2K” and “Ins style” also serve as frameworks for influencing users’ aesthetic tastes [17]. According to data, films on Xiaohongshu that are tagged “Ins style” receive an average exposure that is 2.3 times greater than that of comparable unlabeled videos. This traffic bias encourages artists to deliberately pander to the aesthetic trends that the labels reflect.

The process of standardizing aesthetics heavily relies on the imitation learning mechanism. On Xiaohongshu and Douyin, widely available filter templates significantly reduce the creative threshold while simultaneously undermining creative diversity [18]. According to studies, only 12% of videos have unique visual designs, while 78% employ popular platform filters. This extremely uniform creative phenomenon illustrates how algorithmic recommendation systems stifle artistic innovation.

3.2 Manifestations of Cognitive Reshaping

One such example of cognitive remodeling is algorithmic reliance. According to surveys, 28% of users acknowledged that they “adjust their aesthetic judgments based on platform recommendations,” while 43% of users stated that they “often doubt whether their tastes are influenced by recommended content” [6]. Users’ aesthetic subjectivity is being undermined by algorithms, as seen by their self-examination of “Is my taste equal to recommended content?”.

When using short videos, time fragmentation is very noticeable. Users’ perceptions of time are altered by Douyin’s 15-second video duration threshold, which also affects the narrative rhythm of the content [12]. Eighty-five percent of respondents stated that they “feel time flies when scrolling through short videos,” and sixty-seven percent acknowledged that they “have difficulty concentrating on long-term deep thinking” [5]. Learning, employment, and lifestyle have all been significantly impacted by this shift in temporal cognition [4].

3.3 User Inducement from a User Psychology Perspective

According to user psychology, platforms use a variety of methods to influence users [2]. The first mechanism is instant feedback, which uses real-time interaction data like favorites, comments, and likes to create a strong system of behavior reinforcement [3]. Research indicates that when consumers receive feedback on their interactions, their average usage length improves by 1.8 times [7]. Secondly, the design of ambiguity, like the unknowable sensation of “what will the next video be,” encourages users to keep scrolling the screen [11]. According to a neuroscientific study, this ambiguity causes users to develop a constant drive to investigate by activating the brain’s amygdala, an area linked to curiosity. Additionally, platforms employ the social identity principle, encouraging users to adhere to public aesthetics through the use of labels like “popular recommendations” and “liked by many”. According to experimental data, films labeled “popular recommendation” have a click-through rate that is 47% greater than that of regular videos. This suggests that viewers’ herd mentality is reflected in the collective aesthetic ambiance that algorithms create [13].

4. Research Dilemmas and Future Suggestions

4.1 Cultural Erosion

Popular labels marginalize minority aesthetics due to the

algorithmic traffic distribution mechanism of short-video platforms, which seriously erodes culture [14]. According to research, the average amount of recommendations for traditional handicrafts, niche music, and other types of material is just one-twentieth of that of popular entertainment [1]. Niche aesthetics struggle to get enough channels of communication because of this traffic bias, and mainstream aesthetics eventually overtake them.

For instance, videos with the label “pop music” have an average of 560,000 plays on Douyin, whilst videos with the label “independent music” only have an average of 32,000 plays [7]. The diversity of music composition is impacted by this enormous traffic disparity, which makes it challenging for independent musicians to get noticed on the platform [15]. This could eventually cause the entire cultural environment to become simpler and poorer [16]. This study suggests the following remedies to address this conundrum: In order to allow users to adjust the “aesthetic tolerance” threshold, platforms can first open a portion of the recommendation algorithm parameters. For example, users can set the “niche content recommendation ratio $\geq 15\%$ ” [17]. The needs of various users for various aesthetics can be satisfied by this customized environment. Second, add a “cultural diversity index” as an optimization objective for the system, which assigns traffic weighting to material with specialized aesthetic components [18]. To encourage the dissemination of specialized cultures, for instance, increase the recommendation priority for independent music, movies of traditional handicrafts, etc., under the same circumstances.

4.2 National Pan-Entertainment Phenomenon

The national pan-entertainment phenomenon has been somewhat exacerbated by the algorithmic recommendation system of short-video platforms, which reflects the social status quo of entertainment supremacy [6]. According to studies, entertainment content makes up as much as 72% of the top 1,000 popular videos on Douyin, but knowledge and cultural content only make up 11%. With little opportunity for in-depth thought or learning, this content structure causes the audience to become permanently engrossed in superficial entertainment consumption [12].

Social cognitive development has suffered as a result of the pan-entertainment phenomenon [5]. According to surveys, 63% of people who watch short videos for more than three hours a day acknowledged that they “have difficulty concentrating on reading long articles,” and 54% acknowledged that their “interest in serious topics has significantly decreased” [4]. The public’s awareness and comprehension of social concerns may be impacted by

this cognitive decline, which would impair society’s capacity for logical thought [2].

This study suggests two ways to deal with this problem: first, make “algorithmic cognition” required in elementary and secondary education to teach the fundamentals of information discrimination techniques and recommendation mechanisms [3]. Encourage critical thinking and media literacy in pupils by using experimental teaching techniques like “simulated algorithmic recommendations,” which can help them comprehend the information cocoon effect [7]. Second, platforms introduce “anti-cocoon mode,” which allows consumers to consistently obtain suggestions for cross-domain material [11]. For instance, in order to break the cognitive cycle and expand their knowledge, entertainment aficionados are required to watch 10% of science and cultural videos.

5. Conclusion

This study thoroughly examines societal issues, including the marginalization of niche cultures and the pan-entertainment that results from this, methodically exposing the process by which algorithms on short-video platforms modify aesthetics and cognition through standardization mechanisms. According to the study, algorithms have a significant impact on public aesthetics and cognition and are not only instruments for disseminating information. Their effect has permeated every facet of cultural creation and social cognition. However, this study also has certain limitations. In terms of data dimensions, it is only based on publicly available top 1,000 video data and does not involve the full-volume data of the platform underlying algorithms, which may lead to one-sided research conclusions. In terms of cognitive measurement, it mainly relies on questionnaires and interviews, lacking direct measurement by neuroscientific means such as EEG and fMRI, making it difficult to accurately grasp the physiological impact of algorithms on brain cognitive activities. In addition, cross-platform comparisons are insufficient, and in-depth analysis of overseas platforms such as TikTok and YouTube Shorts is lacking, limiting the universality of research conclusions.

The following areas can be explored further in future research: First, present neuroaesthetic research techniques, evaluate users’ brainwave changes while viewing information suggested by algorithms using technologies like EEG, and disclose the process by which algorithms affect aesthetic cognition from a neuroscientific standpoint. Second, create a global database of short-video algorithms, conduct a cross-cultural comparative study, and examine how algorithmic aesthetics differ and overlap across cultural contexts. Third, work with top platforms to conduct

algorithm optimization tests, improve the practical implementation of solutions, and confirm the efficacy of different solutions. Last but not least, increase the study of ethical aspects, focus on the issue of “digital discrimination” in algorithmic aesthetics, and encourage the development of a more equitable and inclusive online cultural ecology. The study’s conclusions and recommendations give a fresh viewpoint on social cognition and cultural production in the age of algorithms, as well as practical solutions to the societal problems that algorithms have brought about. Given that algorithms are still permeating every aspect of social life, the research has significant theoretical and practical implications and merits more thorough investigation.

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