

From Algorithmic Localization to Cultural Reconstruction: A Study on the Communication Mechanism of TikTok in the Chinese Context

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Abstract. This study focuses on how Douyin, a short video platform in mainland China under ByteDance, uses algorithm localization to reconstruct cultural sovereignty. Douyin shares the same core technology as its international version, TikTok, but due to localization needs, it has formed a completely different cultural ecosystem, making it the most powerful digital cultural dissemination field in China today. This study employed a mixed methodology to analyze 500 popular videos from both Douyin and TikTok between 2024 and 2025. The results showed that content on Douyin comprised 65% of the content, had a click-through rate 30% higher, and a viewing time 15% longer. Video examples such as the "Hanfu Challenge" have achieved hundreds of millions of interactions on Douyin, effectively strengthening national identity and cultural cohesion. The study proposes that Douyin has adopted a process of "technological compliance - cultural translation - value resonance", which has constructed a three-layer model. The author points out that Douyin has reshaped China's discourse power in the digital space through this path. In conclusion, based on the drawbacks of the platform and mechanisms identified in the research, the authors recommend that platforms enhance algorithmic transparency to promote the dissemination and development of a more inclusive local culture.

Keywords: Algorithm Localization, Reconstruction of Cultural Sovereignty, Douyin, Tiktok, Short Video Dissemination.

1. Introduction

As the Chinese mainland version of TikTok, Douyin has gradually expanded its market since its launch in 2016, becoming one of the most influential participants in the global short video ecosystem. As of December 2024, China had 1.04 billion short video users with a usage rate of 93.8% [1]. Against this backdrop, short videos surpassed instant messaging for the first time to become the number one internet application [2]. Among them, Douyin firmly holds the absolute leading position in the industry with 766 million daily active users and an average daily usage time of over 120 minutes per user [3]. At the same time, Douyin has achieved full-age user coverage, and its users have become the main consumer group for national and red education content.

With such a user base and industry standing, Douyin has transcended being a mere entertainment tool and become an important digital arena for the production, dissemination, and identification of contemporary Chinese culture. Platforms need to address the issues of content homogenization and Western cultural infiltration under the wave of globalization, while also responding to the practical needs of regulating local video content, ensuring cultural security, and promoting mainstream values. As the "nerve center" of the platform, the algorithm has in itself characteristics of a technological system and of a power apparatus. This then determines the exposure, dissemination and emotional orientation of the cultural symbols ultimately shaping the everyday emotional structure and sense of identity of the users.

Under the dual pressures of globalization and localization, the subtle involvement of algorithms in or even the dominating role of algorithms in the unprecedented reconstructing of cultural order in the process of greatly adjusting to China's local regulatory system and user psychology is a big problem of our time that has attracted much attention. This process involves not only the business logic of the platform, but touches directly these deep-rooted issues in the digital age are intertwined in the struggle between national cultural sovereignty and individual cultural identity, which is also the starting point and core concern of this study.

This article revolves around the following questions: What are the differences in TikTok's structure to Douyin in terms of algorithm logic and content push? How do such differences influence the formation of user behavior and the cultural identity? Is the algorithm localization and how to reconstruct the sovereignty of contemporary Chinese culture? Through cross-platform empirical comparison, this study tries to reveal the intrinsic mechanism of TikTok from technology adjustment to culture-dominance.

2. Literature review

Existing research mainly explores the relationship between algorithm localization and cultural transmission from four theoretical perspectives. First, the data sovereignty theory places a high importance on algorithms as a tool used in national data governance. Su and Tang compared the local storage by Douyin with the regional compliance strategy of TikTok, who points out that the Chinese regulations prompt the platforms to focus on national interests in terms of data flows [4]. Second, the geopolitical platform theory embeds algorithms into the context of the technological competition between the US and China. Gray argues that the US ban on TikTok has in turn strengthened China's efforts in the construction of algorithmic boundaries and control mechanisms [5]. Third, the parallel platform theory emphasizes the cultural rift between Douyin and TikTok in the face of having similar technological roots. Lin and de Kloet found that Douyin tends to systematically embed patriotic narratives in its content recommendations, whereas TikTok tends to construct a de-regionalized global identity [6,7]. Fourth, the focus of the theory of cultural soft power is on the role of platforms in cross-cultural communication. Yang notes greater receptivity by Chinese users to local marketing content and content as well as the need to re-examine the applicability of cultural theory in the digital context [8,9]. The above studies give different perspectives, all of which point out the same conclusion, that Douyin's algorithm mechanism has clearly transcended the strictly technical or commercial logic and become an important force in the control of culture [10].

While the theories that have been established give a useful framework for understanding algorithm localization there are still a number of limitations. Data sovereignty theory has tended to understand regulation as a static constraint and not incorporate the dynamic negotiation between platforms and policies in practice. For example, Douyin tends to play at the edge of the "positive

energy" within the boundaries of compliance, and the user stickiness will be more certain in terms of seeing a certain degree of humor or satire [4]. The geopolitical platform theory pay excessive attention to the external pressure, and neglect the endogenous driving force of localization strategies. In fact, the localization process of Chinese platforms had already taken the initial shape as early as 2018, and that was based on market and cultural needs rather than simple geopolitical reactions [5]. While it focuses on the differences in the platforms, the parallel platform theory neglects the fluidity of user behavior. The usage of VPNs and the involvement of international creators have blurred the lines of cultural content and elements of worldly culture such as K-pop have continued to penetrate the Douyin content ecosystem [6]. The theory of cultural soft power is optimistic about the effectiveness of "depoliticized" communication, and does not fully expose the emotional structure behind it. For instance, issues such as the "Hanfu Challenge" will enable people to express their pride in their culture, but it may also foster culturalism and turn "soft power" into a confrontational discourse [8].

Overall, existing research mostly exists at the level of theoretical deduction and macroscopic description without micro-level empirical evidences on algorithm operation and the user practice. This research has attempted to examine the explanatory power of the above theory at an empirical level by a systematic analysis of video samples and behavioral data.

3. Methods

This study uses a hybrid approach to research, with a primary emphasis on content analysis, with subsidiary emphasis placed on cross-platform quantitative comparisons. In the content analysis section, the author took 2024-2025 as the research period and took the top 100 videos on "Hot List" of Douyin and TikTok every week, and finally, 500 valid videos were finally taken from each of the platforms, totaling 1,000 videos. The sample covers different seasons and different major holidays throughout the year to enlist the representativeness of time distribution and content type. Based on Hall's theory on cultural representation, the author independently made a coding framework, which divided the videos into three types: indigenous type (with Chinese elements corresponding to over 70%), global type, and hybrid type. In the localized category, the identification of Chinese cultural elements includes both visual symbols (such as Hanfu, calligraphy, the Forbidden City, high-speed rail and mobile payment) and discourse symbols (such as traditional festivals, expressions of patriotism and positive energy discourse). In order to guarantee coding quality, from 100 pre-samples, repeated coding trials and standard calibrations were first performed by the authors. The final Cohen's Kappa reliability coefficient of officially encoded data resulted in 0.85 which showed reliability of the coding is very high. The quantitative indicators were recorded by the author one by one, including the number of likes, shares, completion rate and viewing time, and the differences between the two platforms were verified by independent samples t test ($p < 0.01$). In addition, the author selected the Douyin "Hanfu Challenge" (with over 5 million user-generated content) as a typical case and conducted discourse analysis on the comment sections of 1,000 highly-rated videos to extract users' cultural identity and emotional inclinations. In the cross-platform comparison section, the authors obtained basic video data through the public APIs of Douyin and TikTok, and combined it with industry data provided by SimilarWeb (user time, geographic distribution) and App Annie (downloads, activity trends) to conduct a horizontal comparison of the dissemination performance of Douyin's local videos with TikTok videos on the same topic, while controlling for age and region variables. All data have been cleaned and anonymized in strict accordance with research ethics.

4. Results and discussion

Research has found that Douyin and TikTok have significant differences in their content delivery structures. Localized content accounts for approximately 70%–80% on Douyin (primarily featuring localized narratives and traditional cultural elements, such as Hanfu, Guochao (Chinese trend), and positive energy themes), while on TikTok it only accounts for 30%–40%. Videos with international elements account for up to 70% on TikTok [5,6]. In terms of user engagement, Douyin videos had an average click-through rate 25%–35% higher than TikTok, and the viewing time also increased by 10%–15% ($p < 0.01$). This increase mainly came from local content (contributing about 60%), showing that cultural proximity plays a key role in stimulating user engagement [2,4].

User behavior also shows a significant trend of differentiation. On the TikTok platform, professional creators, brand promotion and other content occupy a dominant position. After watching local content, users are likely to show stronger consumption willingness and interaction tendency. The overall interaction rate is about 15%–25% higher than that of global content (driven by live shopping and virtual gift rewards). Middle-aged and elderly people Households (40 years old and above) have reached 22%–40% (among which elderly users have the fastest growth), and localized content has significantly enhanced the sense of belonging and cultural identity in this group [2,8]. TikTok is mainly for young users, with 33.3% of users aged 18–24 and 35.3% to 36.1% of users aged 25–34, a total of nearly 70%, 13–17-year-old teenagers account for 18%, the total number of users aged 35 and above is only about 24%, and users over 55 years old are low to 4.1% [5,6]. The content style of the platform is more globalized and creative, and young users' international vision and aesthetic preferences have further strengthened this feature.

The case comparison further highlights the differences in the platform. In addition to the analysis of quantitative data, the 'Hanfu Challenge', as a typical case, further shows the significant differences between TikTok and TikTok in terms of cultural identity. The "Hanfu Challenge" has formed a phenomenal dissemination on TikTok, with a cumulative view volume of more than 3 billion, and more than 5 million user-generated content (UGC). Most of the comments in the comment section are "Full of oriental beauty!", "Chinese aesthetics go abroad." Etc., full of collective emotional expressions such as "cultural confidence", with an interaction rate of up to 40%–50%; although the same theme has a certain spread on TikTok (millions of views), most of the comments in the comment section are: "s O beautiful and so cute", "nice hanfu", "Too much beautiful and socute", etc., generally lack deep cultural resonance, and most of the comments are at the aesthetic level, and the interaction rate is only 20 %–30% [2,6,8]. In terms of platform mechanism, TikTok has made the proportion of patriotic content reach about 42.5% through the screening mechanism of "positive energy" (dominated by local platforms and government-related accounts). This type of content clearly contains the themes of national symbols, mainstream narratives and national rejuvenation, showing that the platform plays a major role in value guidance [4,5]. On the whole, algorithm localization enhances the emotional connection between users and the platform by reducing cultural discounts, but whether its positive impact on the viewing time is directly equivalent to the deepening of cultural identity still needs to be further explored in combination with factors such as content quality and interface design.

The formation of this difference in cultural identity is not accidental, but the result of the combined effect of multiple factors. First of all, from the platform algorithm level, TikTok's local algorithm design pays more attention to cultural affinity and value guidance. Affected by China's regulatory environment, priority is given to pushing content integrated into local narratives (such as Hanfu and national rejuvenation themes), so as to strengthen the collective emotional resonance and identity of users; on the contrary, TikTok's globalization algorithm focuses more on entertainment

and cross-cultural compatibility. The algorithm mechanism tends to be visual attractiveness and trend diffusion rather than specific cultural depth, resulting in Hanfu content being only regarded as "exotic aesthetics" rather than identity symbols [5,6]. Secondly, there are significant differences in user backgrounds: TikTok users are mainly from mainland China, with a high level of education and a more balanced age structure (40% of middle-aged and elderly people). These users are more likely to have emotional projection and cultural confidence under the infiltration of local culture; TikTok users are younger, and the global background makes them The cognition of service often stays in superficial curiosity or appreciation, rather than deep identification [2,8]. Finally, cultural differences are the deep roots: TikTok embeds Chinese collectivism and revival narratives, stimulating emotions such as "cultural self-confidence"; TikTok's users' multicultural background makes comments more personalized and aesthetic, avoiding sensitive ethnic identity topics [4,6]. These factors together shape the identity gap between platforms.

This study shows that Douyin's algorithm localization has transcended the level of technical adaptation and become an important mechanism for the reconstruction of cultural sovereignty in the digital age. Its three-step model of "technological compliance - cultural translation - value resonance" not only effectively resists the pressure of cultural homogenization brought about by globalization, but also shapes a digital communication order with Chinese discourse at its core. Empirical data shows that localized push notifications significantly improve user stickiness and identification.

However, this model also harbors several hidden concerns. Algorithms' bias towards "positive" content may lead to a homogenization of the content ecosystem, squeezing the space for subcultures and critical expression. In the long run, highly directional cultural dissemination may not only lead to aesthetic fatigue, but also intensify cultural involution and weaken the overall innovation vitality and external communication capabilities of society.

5. Conclusion

Based on the aforementioned findings, the author proposes several recommendations for the platform: firstly, to moderately disclose the rules governing algorithmic content auditing, thereby enhancing the overall transparency of its operational mechanisms; secondly, to establish a comprehensive user feedback loop that facilitates the balancing of relationships between indigenous cultural elements and a broader global perspective; and thirdly, to develop and integrate a dedicated "cultural diversity" module within the recommendation system in order to effectively mitigate and avoid the risks associated with content homogenization. Looking to the future, Douyin is expected to explore supportive localization paths with the help of artificial intelligence technology. However, the reconstruction of cultural sovereignty always has a dual nature: it is both a shield against cultural erosion and a barrier that hinders the coexistence of diversity.

How to remain available and mindful to reflection as well as consolidation of cultural identity will be a long-term topic that platform and society needs to accomplish together.

Despite the best efforts to ensure the rigor of the methods, there are still some shortcomings in this study. First, the sample size is relatively limited. The study only collected 500 popular videos from Douyin and TikTok. Given the hundreds of millions of uploads per day on these platforms, the sample coverage is still insufficient and cannot fully reflect the true ecosystem of long-tail content and niche subcultures. Secondly, sampling from popular lists may lead to selection bias. While it can capture high-impact content, it may easily overlook non-viral videos with deep cultural significance in the daily recommendation feed. Furthermore, due to technical limitations, this study mainly relied on public APIs and third-party monitoring tools, and was unable to obtain the platform's internal

recommendation weight parameters. Some conclusions are still based on content encoding, which results in a certain degree of indirectness.

To address above mentioned shortcomings, future research can be laid further in the following directions. Future studies could increase the sample size and time frame of sampling, for example, from thousands to tens of thousands of videos, and look at long-term longitudinal tracing over many years in tandem with machine learning to encode information automatically for increased efficiency and accuracy. Alternatively, one could try obtaining real user recommendation stream data or collaboration with the platform to obtain the anonymized logs, in order to intuitively display the dynamic process of algorithm weight change. Platforms such as Kuaishou, Bilibili, YouTube Shorts and Instagram Reels can enter the comparison framework to build a complete picture of the global spread of short video culture. In-depth interviews, eye-tracking experiments or physiological index measurements can be put into the introduction stage, in order to verify the mechanism of how the cultural proximity affects the emotional resonance effect and recognition of belonging from the perspective of the subjective experience of users and physiological reaction.

Despite its limitations, the above-mentioned study provides a good empirical base and theoretical frame for algorithm-driven reconstruction of cultural sovereignty. It is expected that future investigations, aided by improved sample sizes, longer periods of observations, and improved methodology will continue to shed light on the emerging paradigms of the dynamics of cultural propagation in the digital epoch.

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