



## OPEN ACCESS

### EDITED BY

Daisuke Akiba,  
The City University of New York,  
United States

### REVIEWED BY

Prasongchai Setthasuravich,  
The University of Tokyo, Japan  
Bhaskarjyoti Das,  
PES University, India

### \*CORRESPONDENCE

Gao Jiayao  
✉ researcher1108@163.com

RECEIVED 04 November 2025

REVISED 12 February 2026

ACCEPTED 17 February 2026

PUBLISHED 03 March 2026

### CITATION

Yuehua C and Jiayao G (2026)  
Quantifying the digital cultural divide:  
how platform algorithms shape rural–  
urban identity politics in China.  
*Front. Hum. Dyn.* 8:1736838.  
doi: 10.3389/fhumd.2026.1736838

### COPYRIGHT

© 2026 Yuehua and Jiayao. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

# Quantifying the digital cultural divide: how platform algorithms shape rural–urban identity politics in China

Chen Yuehua<sup>1</sup> and Gao Jiayao<sup>2\*</sup>

<sup>1</sup>School of Marxism, Southeast University, Nanjing, Jiangsu, China, <sup>2</sup>Department of Scientific Socialism, Jiangsu Provincial Party School of the Communist Party of China, Nanjing, Jiangsu, China

Against the backdrop of the in-depth advancement of Digital China and the rural revitalization strategy, short video platform algorithms, as a novel cultural intermediary force, are intricately linked to the reconstruction of the political ecology of urban-rural cultural identity. Existing research on digital technology and rural development predominantly focuses on macro policy and micro individual behavior levels, lacking systematic empirical investigation into how platform algorithms, as a structural force, shape urban-rural cultural identity. This study employed a nationwide stratified sampling survey, with urban and rural residents as the research subjects, and utilized regression analysis and structural equation modeling to systematically examine the differential association mechanisms of algorithm recommendation systems on the cultural identity of urban and rural residents, as well as the moderating roles of social structural factors such as household registration and education level. The results revealed that algorithm exposure is significantly and positively correlated with users' acceptance of rural modernity narratives, which is specifically reflected in the significant enhancement of fusion innovation identification. Urban-rural household registration, as a key social location variable, moderates the association path between algorithm exposure and reality identification: urban user groups exhibit a positive correlation between the two, whereas rural user groups show no such association. Active search behavior weakens the association with algorithm domestication, as users resist the infiltration of a single narrative through autonomous information acquisition. Notably, different short video platforms exhibit significant differences in their associations with cultural identity, and both the urbanization level of permanent residence and education level exert significant moderating effects on cultural identity and algorithm perception. Based on these findings, this study proposes the "Algorithm Domestication Gap" defining the digital cultural divide as a multi-dimensional cognitive gap within the framework of the third-generation digital divide. This concept extends the knowledge gap theory, providing a theoretical lens for understanding technology-mediated urban-rural cultural politics, and offers practical implications for digital rural construction and platform governance.

### KEYWORDS

digital cultural divide, platform algorithm, short videos, urban and rural identity recognition, urban–rural cultural identity

# 1 Introduction

## 1.1 Research background and problem origin

Under the dual promotion of the Digital China strategy and the rural revitalization strategy, the process of urban–rural integration is undergoing profound structural changes. This change is not only reflected in the interconnectivity of physical infrastructure and the restructuring of economic factors, but also goes deeper into the process of cultural identity and social psychology reconstruction. In recent years, short video platforms, as the most permeable application form of digital technology, are associated with reshaping the basic logic of information dissemination and meaning construction through their highly personalized algorithm recommendation systems (Bin, 2024), thereby exhibiting a profound association with the cultural cognition and identity recognition of urban and rural residents. The traditional theory of urban–rural relations focuses on the analysis of the flow of “hard elements” such as capital and labor, while in the digital age, culture, as an active “soft element,” has become a key dimension for understanding the quality of urban–rural integration in terms of flow direction, narrative power, and identity effect.

The dual structure of urban and rural areas is not only an economic and geographical phenomenon, but also a profound cultural and political construction. In history, the narrative of mass media often reinforces the stereotypical opposition between “city = modern/progressive” and “countryside = traditional/backward.” However, the low threshold, strong interaction, and decentralized characteristics of short video platforms theoretically provide the possibility to break this one-way cultural output. The platform algorithm, through its complex content distribution mechanism (Lee et al., 2021), may be associated with dissolving traditional cultural biases and promoting mutual understanding and cultural exchange between urban and rural areas; It is also possible to solidify or even magnify existing cognitive differences under the drive of commercial logic, being associated with the formation of a new digital cultural divide. The cultural politics mediated by this algorithm constitutes the most dynamic and uncertain field in the current urban–rural integration development.

## 1.2 Research question and significance

The existing literature on digital technology and rural development mainly focuses on two levels: one is the macro policy level, analyzing how digital infrastructure empowers rural governance and economic revitalization (Wang M. et al., 2025; Wang and Zhang, 2025; Zhang and Li, 2024; Zhao et al., 2024; Ma et al., 2023; Li, 2024). The second is at the micro behavioral level, examining the media usage practices of specific groups such as returning youth and internet celebrities (Croucher et al., 2023; Chen et al., 2025; Wang and Sandner, 2019; Ju et al., 2024; Ting, 2016). However, a key research gap lies in the lack of empirical testing on how platform algorithms as a structural force are systematically associated with urban–rural cultural identity. Most studies are limited to case descriptions or theoretical deductions, failing to quantitatively analyze the associative mechanisms between algorithm exposure, usage patterns, and different dimensions of cultural identity (such as nostalgia, reality criticism, and fusion innovation). In particular, there is a lack of in-depth discussion on the regulatory role of social structural factors such as urban and rural registered residence, residence, education level and so on.

More importantly, the core concept of the “digital cultural divide” remains insufficiently specified in existing research—while relevant studies are situated within the third-generation digital divide research, it is not entirely clear whether the divide refers primarily to differences in algorithmic exposure, interpretive capacity, or downstream cultural identity outcomes. Additionally, there is a lack of clarification on the intrinsic connection between the proposed “Algorithm Domestication Gap” and existing digital divide and knowledge gap theories, which limits our precise understanding of how digital technology is associated with social integration.

Notably, this study relies on cross-sectional survey data and self-reported measures of algorithm exposure, which limits causal inference and raises potential endogeneity concerns—for instance, individuals with certain identity orientations may be more likely to rely on algorithmic recommendations. Therefore, all findings should be interpreted as associative or mediating relationships rather than direct causal effects.

This study aims to address the theoretical gaps mentioned above through rigorous empirical design. The core research question is: How does the algorithm recommendation system of short video platforms differentially influence the cultural identity of urban and rural residents? Is its impact mechanism regulated by the socio-economic characteristics of users? Therefore, this study operationalizes cultural identity into three dimensions: “local nostalgia identity,” “hardship reality identity,” and “fusion innovation identity,” and collects large-scale questionnaire survey data. Regression analysis and structural equation modeling are used for testing.

The structure of the paper is arranged as follows: The second part will systematically review the evolution and integration of urban–rural relationship theory, digital divide research, and cultural identity theory, construct the theoretical framework of this study, and propose specific hypotheses. The third part elaborates on the mixed research method mainly based on questionnaire surveys, including variable measurement, sampling plan, and data analysis strategy. The fourth part presents the results of descriptive statistics, reliability and validity testing, and hypothesis testing. The fifth part will engage in a dialogue between research findings and existing theories, exploring their academic contributions and policy implications for digital rural construction and platform governance. The sixth part summarizes the entire text, points out the limitations of the research, and looks forward to future directions.

This study attempts to make subtle academic efforts in the following areas: firstly, to push algorithm research from the perspective of technical efficiency to the cultural and political level, and explore its social implications as a tool for identity construction; Secondly, establish a quantifiable cultural identity analysis framework to provide methodological references for subsequent comparative research; Thirdly, through empirical analysis of the digital cultural divide between urban and rural areas in the Chinese context, provide an analytical case for similar issues in countries in the global South. Notably, this study also draws parallels with urban–rural domestic migration research—both involve core issues of “identity adaptation” and “cultural integration,” and share common variables such as social position, cultural capital, and environmental adaptation. The “cultural identity differences” examined in this study can be understood as a form of “migration of the mind,” which may interact with physical domicile migration (facilitate or precede it), thereby enriching the theoretical dialog between digital cultural research and migration studies. Additionally, this study pays attention to the hidden risks behind the

“digital rural–urban continuum”—though it facilitates easy transition for the ready and willing, subgroup-level analysis reveals the existence of “echo-chambers,” “filter bubbles,” and “groupthink” among specific user groups, making the situation ripe for policy-level intervention. The research results are expected to provide new empirical evidence and theoretical perspectives for understanding the urban–rural relationship in the digital age.

## 2 Literature review and theoretical framework

This chapter aims to systematically sort out the theoretical framework related to this study and construct a theoretical framework suitable for analyzing the impact of digital platform algorithms on urban and rural cultural identity. Firstly, review the evolution of urban–rural relationship theory and analyze the paradigm shift from structural determination to cultural construction; Then examine the three waves of research on the digital divide, focusing on power relations in the process of technological socialization; Finally, integrate the theoretical spectrum of cultural identity, construct an analytical framework connecting algorithmic mediation and identity politics, and propose specific hypotheses for this study.

### 2.1 Evolution of urban rural relationship theory: from structural dualization to cultural interaction

The theory of urban–rural relations has undergone a paradigm shift from economic determinism to cultural constructionism. Early research was influenced by the classical binary structure theory, emphasizing the resource deprivation and dependence relationship between urban and rural areas, and viewing rural areas as passive recipients in the process of modernization. This structural functionalist perspective reveals the inequality in the allocation of material resources, but it is difficult to explain the complexity of urban–rural cultural interaction. With the deepening of globalization, the new Marxist geography proposes the “relational turn,” emphasizing the productivity and mobility of urban and rural spaces. The Desakota model breaks through the traditional dichotomy and focuses on the mixed ecology of urban–rural fringe areas; Brenner’s multi-scale governance theory reveals the reconstruction mechanism of urban–rural relations in the context of globalization, promoting research from hierarchical domination to networked interaction.

In the context of China, the study of urban–rural relations presents a paradigm shift from “rural China” to “urban–rural China.” The differential pattern theory proposed by Fei Xiaotong reveals the cultural logic of traditional rural society, while the study of new urbanization emphasizes the possibility of bidirectional flow of urban–rural factors. In recent years, scholars have pointed out that the popularization of digital technology has given rise to the “digital urban–rural continuum,” which has led to a restructuring of the allocation of cultural resources between urban and rural areas (Zhou et al., 2025; Liu et al., 2023; Wang et al., 2023; Sovetova, 2021). Though this continuum facilitates easy transition for the ready and willing, subgroup-level analysis still reveals prominent phenomena such as “echo-chambers,” “filter bubbles,” and “groupthink”: for example, rural users with strong nostalgic tendencies are continuously pushed homogeneous rural

nostalgic content by algorithms, forming closed “echo-chambers” that strengthen traditional rural stereotypes; urban users who hold biased views on rural areas may be trapped in “filter bubbles” of negative rural narratives, while “groupthink” within specific online communities further consolidates these one-sided cognitions. These phenomena hinder the effective flow of cross-cultural narratives and the formation of inclusive urban–rural identities, making the situation ripe for policy-level intervention. This reconstruction is not only reflected in the material level, but also deeply affects the cognitive framework and identity recognition of urban and rural residents, providing a new perspective for understanding urban and rural cultural politics.

Notably, urban–rural domestic migration has attracted increasing attention in recent years, with studies covering both intra-country and inter-country contexts. Although migration research traditionally focuses on domicile changes, it shares core relevance with this study’s focus on “migration of the mind” (i.e., cultural identity transformation). Existing migration studies have shown that physical domicile migration and psychological/cultural migration may facilitate each other—sometimes “migration of the mind” (such as acceptance of urban cultural norms or recognition of rural modernization) precedes physical domicile migration, laying the cognitive foundation for cross-regional mobility. This interactive relationship provides an important theoretical interface for connecting urban–rural identity research with migration studies, as both involve common variables such as social integration, cultural adaptation, and identity negotiation.

There is still a lack of systematic analysis on how digital technology mediates urban–rural cultural interaction in existing research. Most research focuses on the economic or institutional level, with less attention paid to the micro mechanisms such as algorithm recommendations that shape urban–rural identity. This study attempts to extend the theory of urban–rural relations to the field of digital culture and explore how platform algorithms are associated with the construction process of urban–rural identity.

### 2.2 Evolution of digital divide research: from technology access to cognitive domestication

The theory of digital divide has undergone three paradigm shifts: the first generation of research focused on inequality at the level of technological access, paying attention to differences in hardware devices and network coverage; The second generation of research focuses on the differentiation between skills and digital literacy, emphasizing the differences in the ability to effectively utilize digital resources; The third generation of research delves into the gap between knowledge acquisition and cognition, revealing the social differentiation effects brought about by the use of technology. The cumulative cycle model of “access skills use” proposed by Van Dijk points out that the digital divide is a dynamic reinforcement process, and initial access differences will lead to exponential differentiation of subsequent usage benefits.

In recent years, there has been a cultural shift in research on the digital divide. Scholars have proposed the concept of “technological subjectivity,” which refers to the game relationship between subjectivity and technological power in the process of technological internalization (D’Amato, 2025). This perspective shifts the focus from technological accessibility to the relationship between technology and society, with a particular emphasis on the role of algorithmic

recommendation systems in being associated with shaping user cognitive frameworks. For example, platform algorithms may be associated with reinforcing users' inherent biases and creating an "information cocoon" effect through personalized content filtering. In the context of urban and rural areas, this algorithm domestication may be associated with reproducing or even exacerbating traditional cultural hierarchy structures.

Chinese scholars' localization research on the digital divide reveals the complexity of urban–rural differences (Yang et al., 2025; Wang and Liu, 2025; Yan et al., 2023; Qi et al., 2023). Research based on field investigations shows that the digital divide among rural populations is not only due to infrastructure gaps, but also closely related to cultural traits and educational levels. The division between digital natives and digital immigrants reveals from an intergenerational perspective how differences in the socialization of technology affect the development of digital abilities. These studies provide an important foundation for understanding the cultural dimensions of the urban–rural digital divide, but there is limited in-depth analysis of how algorithmic recommendations, as a specific technical mechanism, are associated with the formation of urban–rural cultural identity. More critically, existing research has not clearly defined the core connotation of the "digital cultural divide"—while most studies are positioned within the third-generation digital divide research, they fail to explicitly distinguish whether the divide is dominated by differences in algorithmic exposure, differentiation in interpretive capacity, or divergence in downstream cultural identity outcomes. This ambiguity leads to a lack of clear theoretical positioning for the analysis of the digital cultural divide.

To make up for this deficiency, this study clearly defines the "digital cultural divide" concerned herein as an extended core concept of the third-generation digital divide: it is not limited to traditional dimensions such as technology access and usage skills, but specifically refers to a multi-dimensional cognitive gap composed of three interrelated mechanisms: differences in algorithmic exposure, differentiation in cultural content interpretive capacity, and divergence in downstream cultural identity outcomes. Among them, "differences in algorithmic exposure" refer to the differences in the type, frequency, and depth of algorithm-recommended content contacted by different groups; "differentiation in cultural content interpretive capacity" is associated with the differences in individuals' information criticism and interpretation abilities formed by factors such as education level and social experience; "divergence in downstream cultural identity outcomes" is the final differentiation in urban–rural cultural cognition and identity among different groups associated with the joint action of the first two mechanisms.

On this basis, the "Algorithm Domestication Gap" proposed in this study is the specific manifestation of the digital cultural divide at the cognitive domestication level. Its core connotation is: groups with different social positions (such as urban and rural household registration, different education levels) exhibit differences in cognitive frameworks and cultural identities associated with differences in algorithmic exposure patterns and cultural content interpretive capacity during the process of algorithmic content domestication through personalized recommendations. This concept not only inherits the core concern of the third-generation digital divide theory on "knowledge acquisition and cognitive differences" but also responds to the core hypothesis of the knowledge gap theory that "individual cognitive capacity affects information processing effects." Different from the traditional knowledge gap with "mass media information" as the carrier, this study expands the carrier to "algorithm-mediated personalized content" and focuses on the unique content filtering and cognitive shaping association of "domestication" of

algorithms, revealing the new role path of technical intermediaries in cognitive differentiation in the digital age.

### 2.3 Theoretical basis of cultural identity: multidimensional construction and power dimension

The theory of cultural identity originates from the theory of social identity, emphasizing that individuals construct their self-concept through social classification and comparison processes. In urban and rural research, cultural identity often involves authentic political issues—that is, what constitutes "authentic" rural or urban identity. Traditional research often regards urban–rural identity as an inherent trait from a static perspective, while contemporary research emphasizes the fluidity and contextuality of identity. For example, research on local identity suggests that an individual's cognition, emotions, and behavioral intentions toward a place collectively constitute a multidimensional structure of identity (Miocevic et al., 2022; Niezgoda and Szymanska, 2024; Yuan et al., 2022; Wang Y. H. et al., 2025). From current research results, local identity is generally divided into four dimensions: historical identity (Li, 2025), cultural identity (Jing, 2024; Strizhakova and Coulter, 2019; Chan et al., 2024), emotional identity (Belanche et al., 2021), and behavioral identity (Bernardo, 2023), providing a theoretical basis for quantitative research.

In the digital media environment, the construction mechanism of cultural identity is associated with significant changes. The platform algorithm is associated with participating in the symbolic construction process of "rural" or "urban" by users through content filtering and distribution. This construction is often intertwined with business logic and power relations, forming specific representational politics. For example, the presentation of rural areas on short video platforms often oscillates between two poles: one is a romantic pastoral narrative, and the other is a curious display of suffering. These numerical representations not only reflect reality, but also are actively associated with the reconstruction of urban and rural cultural identity.

The study of cultural identity in the Chinese context pays special attention to the issue of identity transformation during the rapid urbanization process. Scholars have pointed out that the identity negotiation of urban and rural immigrants often faces the dilemma of "dual disengagement," and digital platforms may provide a flexible space for identity construction (Zou, 2023). This "dual disengagement" essentially reflects the tension between physical domicile migration and "migration of the mind"—immigrants may have completed physical relocation but not yet achieved cognitive and cultural integration, or their "migration of the mind" (such as recognition of urban culture) may drive subsequent physical migration. This parallel with migration studies highlights the commonality of identity adaptation issues across different research fields. Related studies have shown that digital technology can become a medium associated with individuals to achieve identity transformation (Liu and Fan, 2025). However, existing research lacks empirical testing on how algorithms are systematically associated with the differential construction of cultural identity among different groups.

### 2.4 Algorithm the cross integration of power and cultural politics: the theoretical intersection not fully explored

Algorithmic power, as a new power form in the digital age (Airoldi, 2024), is deeply intertwined with cultural politics, which

provides a key analytical perspective for understanding urban and rural cultural identity, but the existing research has not yet formed a systematic integration. The algorithm is not a neutral technical tool, but a power operation carrier embedded with capital logic (Consolati, 2023), regulatory rules (Riordan et al., 2025) and user value orientation (O'Reilly et al., 2024). It deeply participates in the representation production and political game of urban and rural culture through technical mechanisms such as content distribution, traffic distribution and label coding.

From the perspective of symbolic power theory, Bourdieu's "illusio" (Gutiérrez, 2022) representation dominating logic presents a new form in the digital age: the platform algorithm implicitly establishes the symbolic hierarchical order of urban and rural culture by defining the evaluation criteria of "high-quality rural content" and setting the transmission threshold of rural narrative. For example, the algorithm's inclination to the flow of "Pastoral" rural scenes and its lack of attention to the practice of rural modernization transformation are essentially the selective construction of rural cultural connotation by symbolic power through technical means. This construction not only shapes the cognitive bias of urban users toward the countryside, but also affects the self-cultural positioning of rural residents.

The core issues of algorithmic governance research—governance model of algorithmic system (Gritsenko and Wood, 2022; Tironi and Lisboa, 2023; Issar and Aneesh, 2022), power balance mechanism (Aytac, 2024) and ethics (Poti et al., 2026), provide an important theoretical tool for analyzing urban and rural cultural politics. The existing research on the technical optimization (Gorwa et al., 2020; Pitt et al., 2020; Peterson-Salahuddin, 2024) or risk prevention and control (Hannah-Moffat, 2019) of multi focus algorithm ignores its political effect in the field of urban and rural culture: the content review mechanism of the platform algorithm and the weight setting of the recommendation algorithm actually constitute the "implicit regulation" of rural narrative. Some critical and marginal rural expressions are placed on the edge of communication by the algorithm because they do not conform to the logic of commercial flow or the mainstream cognitive framework, while the rural narrative that conforms to the market and romantic imagination is amplified. The essence of this selective presentation is the implicit intervention of algorithmic governance in rural cultural politics.

The media theory further reveals the core role of the algorithm in the construction of urban and rural cultural identity: the digital platform has become the core field of urban and rural cultural practice, and the algorithm transforms specific rural narratives into social consensus through agenda setting, framework shaping and reality transformation (Kent and Li, 2020). For example, the centralized push of the algorithm on rural "intangible cultural heritage culture" (Yin, 2024) "ecotourism" (Wang and Wu, 2022) and other topics has promoted the formation of the mainstream representation of rural culture, and this media construction in turn affects the choice of rural development path and the direction of residents' cultural identity.

The existing research has not systematically integrated algorithmic power, symbolic power, algorithmic governance and media theory, especially the lack of specific mechanism analysis for the platform to build cultural representativeness and standardize rural narrative. How does the algorithm realize the operation of symbolic power through technical coding? How does the rule design of algorithmic governance affect the diversity of rural narrative? What changes have taken place in the interactive mechanism of urban and rural cultural identity in the process of media? The suspension of these issues makes it difficult

for the existing research to fully reveal the deep logic of urban and rural cultural politics in the digital age, and also leaves a key space for the expansion of this study.

## 2.5 Theoretical framework integration and research hypotheses

Based on the literature review above, this study constructs a theoretical framework that connects platform algorithms, usage behavior, and urban–rural cultural identity. The core of the framework is to analyze how algorithm recommendation can differently shape users' cultural identity by influencing their content contact patterns, and examine the moderating role of social factors such as urban and rural registered residence.

The platform algorithm influences users' cognitive framework of urban and rural areas through content filtering and distribution mechanisms. Algorithmic recommendation systems build personalized information environments based on user profiles and behavioral data. This information environment may strengthen or weaken specific urban–rural narratives, thereby affecting users' cultural identity. Therefore, a hypothesis is proposed:

*H1: Algorithm exposure is significantly positively associated with users' identification with fusion innovation.*

As the institutional carrier of algorithm logic, platform types may have differentiated effects. The algorithmic values and content ecology of different platforms may lead to differences in urban–rural representation, which in turn affects user identification. Therefore, a hypothesis is proposed:

*H2: There are significant differences in the association between platform types and cultural identity.*

As an important social location variable, urban and rural registered residence may adjust the impact path of the algorithm on cultural identity. Due to the different life experiences and cultural capital of urban and rural users, their interpretation and internalization of algorithm content may exhibit systematic differences. Therefore, a hypothesis is proposed:

*H3: Urban and rural registered residence plays a moderating role in the relationship between algorithm exposure and cultural identity.*

Education level, as a core variable reflecting individual knowledge reserves and cognitive abilities, may moderate the impact path of algorithms on cultural identity. Due to differences in information filtering abilities, critical thinking, and cultural cognitive frameworks among groups with different educational levels, their interpretation logic, acceptance level, and ways of transforming algorithmic recommended content into cultural identity may exhibit systematic variations. Therefore, a hypothesis is proposed:

*H4: Educational level plays a moderating role in the relationship between algorithm exposure and cultural identity.*

*H5: The higher the level of urbanization in the permanent residence of the educated, the more likely it is to be associated with weakening their sense of rural nostalgia.*

This theoretical framework attempts to combine technical analysis with social analysis, focusing on both the materiality of algorithmic mechanisms and the moderating role of social contexts. It also incorporates the core insight from migration studies that “physical migration” and “migration of the mind” interact, framing algorithm-mediated cultural identity changes as a digital-era form of “migration of the mind”—one that may precede or facilitate physical urban–rural migration. This integration enriches the theoretical connections between the two fields and provides a more comprehensive perspective on urban–rural identity dynamics. Through this framework, we hope to reveal the intermediary role of digital platforms in urban and rural cultural politics, providing a new perspective for understanding contemporary urban–rural relations.

### 3 Research methods

This chapter aims to systematically elaborate on the methodological design of this study, including research paradigm, data collection plan, variable operationalization, and analysis strategy. The study adopts the positivist paradigm and uses quantitative analysis methods to examine the impact mechanism of short video platform algorithms on urban and rural cultural identity. This chapter first explains the theoretical basis of the research design, then describes in detail the variable measurement, sampling process, and quality control measures, and finally elaborates on the specific process of data analysis. The entire research design aims to ensure the reliability and effectiveness of the research results at the methodological level.

#### 3.1 Research paradigm and design approach

This study is based on the positivist research paradigm, using a cross-sectional survey design and collecting data through a structured questionnaire. The reason for choosing this paradigm is that it can verify theoretical hypotheses through observable variable relationships, which meets the need for quantitative analysis of the impact mechanism of algorithms in this study. The research design focuses on inferring causal relationships between variables, enhancing the reliability of conclusions by controlling for irrelevant variables.

At the methodological level, research attempts to combine quantitative analysis with theoretical construction. On the one hand, obtaining objective data through standardized measurement tools; On the other hand, drawing on the theories of digital divide and cultural identity to construct an analytical framework. The design of this hybrid method ensures both the scientific validity of the data and the theoretical depth of the research.

The study pays special attention to the rigor of methodology. In the process of variable manipulation, mature scales related to domestic and foreign research were referenced, and adaptive revisions were made based on the Chinese context. In sampling design, probability sampling method is used to ensure sample representativeness. In the data analysis stage, multiple statistical methods are used to cross validate research hypotheses.

#### 3.2 Variable operationalization and measurement tools

The dependent variable cultural identity is measured using a multidimensional scale. Referring to existing literature, cultural identity

can be operationalized into three dimensions: rural nostalgia identity, hardship reality identity, and fusion innovation identity. Each dimension contains 4 items and is measured using a Likert 7-point scale. Pre testing was conducted during the scale design process to ensure that the items have good content validity and discriminant validity.

The independent variable platform usage behavior includes three levels: usage intensity, algorithm exposure, and content preference. The intensity of use is measured by daily usage duration and frequency; Algorithm exposure is evaluated by the degree of user dependence on platform recommended content. This operationalization is justified for three reasons: first, it aligns with the core connotation of algorithmic mediation—users’ perceived dependence directly reflects the extent to which their content contact is shaped by algorithmic logic rather than random browsing; second, existing empirical studies on algorithmic influence (e.g., information cocoon research) often adopt similar subjective perception indicators due to the difficulty of accessing objective platform algorithm data; third, perceived dependence effectively captures the interactive relationship between algorithmic push and user acceptance, which is more in line with the “mutual construction” perspective of technology and society than one-sided objective indicators. Content preferences are evaluated based on users’ viewing frequency of different types of rural videos. These indicators have been determined through literature research and expert consultation, and have good surface validity.

The regulatory variables and control variables include urban and rural registered residence, demographic characteristics, etc. The urban and rural registered residence is measured by dichotomous variables; Demographic variables include conventional social demographic indicators such as age, gender, and education level. All variables are measured using standardized problems to ensure comparability and reliability of the data.

#### 3.3 Sampling plan and data collection

The sampling method adopts multi-stage stratified random sampling. The first stage is divided into three major economic zones: the eastern, central, and western regions; In the second stage, sampling will be conducted within each zone based on the proportion of urban and rural population; In the third stage, a combination of random number dialing method and online sample library will be used to contact the respondents. This sampling design ensures regional representativeness of the sample while balancing the urban–rural ratio.

Strict quality control measures were implemented during the data collection process. Including setting attention detection questions to exclude arbitrary answers; Set a time threshold for answering questions (completing the questionnaire in less than 5 min is considered invalid); Use logical check items to identify conflicting answers. In addition, missing value checks and outlier detection were performed on the data to ensure its quality.

### 4 Research finds

This chapter aims to systematically present the main results of empirical analysis, revealing the impact mechanism of short video platform algorithms on urban and rural cultural identity through multi-level testing of 1,200 valid questionnaire data. Data analysis follows a rigorous statistical process, from sample description, reliability

and validity testing to hypothesis verification, gradually expanding empirical examination of theoretical models. The research findings not only validate some initial hypotheses, but also present a complex picture of how algorithms affect urban–rural identity, providing new empirical evidence for understanding cultural politics in the digital age.

### 4.1 Sample basic feature description

The survey sample consists of 1,200 people, and Table 1 shows the demographic distribution of the survey sample. Among them, the urban and rural registered residence accounts for 50% respectively, and the gender ratio is basically balanced (50.5% for women and 49.5% for men). The distribution of permanent residences in the sample is relatively uniform, with the highest proportion in provincial capitals and municipalities (27.67%), followed by rural areas (20.67%). The age group is concentrated in the age range of 26–45 years old, accounting for 57.6% of the total sample, indicating that it is mainly composed of middle-aged and young people. The education level is mainly undergraduate (26.5%) and associate degree (24.25%), with a

relatively high overall level of education; The monthly income is mainly concentrated in the range of 3,001–8,000 yuan (45.75%), reflecting the characteristics of the middle-income group. Overall, the sample has good structural representativeness, providing a reliable population foundation for subsequent analysis.

Table 2 presents the survey results on the use of short video platforms. Among them, the respondents mainly use Tiktok (39.17%) and Kwai (27.42%) as the main platforms, and Xiaohongshu accounts for 24.33%, indicating that the public focus on mainstream short video applications. The daily usage duration is mainly 1–2 h (34.33%) and 2–4 h (28.00%), indicating high user stickiness. In terms of viewing methods, 42.83% of respondents mainly rely on algorithm recommendations, and 28.67% actively search for content, indicating that the consumption of short video content has shown a coexistence of “algorithm driven” and “interest oriented” characteristics. Overall, short video platforms have a high frequency of use, concentrated duration, and significant algorithmic impact in the sample population.

Table 3 presents the descriptive statistical results of the variables in this survey. The overall mean of the four main dimensions is higher than the median, indicating that the respondents have a strong overall

TABLE 1 Distribution of demographic characteristics.

Name	Option	Frequency	Percentage (%)
Household registration type	Agricultural household registration (rural registered residence)	600	50.00
	Non-agricultural household registration (urban registered residence)	600	50.00
Place of permanent residence	Township	215	17.92
	Rural areas	248	20.67
	County town or county-level city	206	17.17
	Prefecture-level city	199	16.58
	Provincial capital city or municipality directly under the central government	332	27.67
Age	18–25 years old	255	21.25
	26–35 years old	390	32.50
	36–45 years old	301	25.08
	46–55 years old	165	13.75
	56 years old and above	89	7.42
Gender	Female	606	50.50
	Male	594	49.50
Education level	Junior high school and below	224	18.67
	Associate degree	291	24.25
	Undergraduate	318	26.50
	Graduate students and above	97	8.08
	High school/vocational school	270	22.50
Monthly income	12,001–20,000 yuan	97	8.08
	Above 20,000 yuan	42	3.50
	3,000 yuan and below	267	22.25
	3,001–5,000 yuan	283	23.58
	5,001–8,000 yuan	266	22.17
	8,001–12,000 yuan	245	20.42
Total		1,200	100.0

TABLE 2 Platform usage behavior.

Name	Option	Frequency	Percentage (%)
Common short video platforms	Little Red Book	292	24.33
	Kwai	329	27.42
	Tiktok	470	39.17
	Others	109	9.08
Daily usage duration	Less than 30 min	99	8.25
	30 min to 1 h	216	18.00
	1 to 2 h	412	34.33
	2 to 4 h	336	28.00
	More than 4 h	137	11.42
Main viewing methods	The two are similar	342	28.50
	Mainly actively search for content of interest	344	28.67
	Mainly watch the content recommended by the platform algorithm	514	42.83
Total		1,200	100.0

level of cultural identity. Among them, the fusion innovation identification is the highest ( $M = 4.341$ ), followed by the local nostalgia identification ( $M = 4.182$ ) and the hardship reality identification ( $M = 4.038$ ), while the algorithm perception and influence are relatively low ( $M = 3.562$ ). The standard deviation is relatively small, indicating that the distribution of the sample is relatively concentrated in all dimensions. This result indicates that the respondents hold a positive attitude toward both traditional and innovative cultures, but there is a noticeable differentiation in their perception of the impact of algorithms, suggesting that they still have some caution and rational judgment regarding their dependence on algorithm recommended content.

Table 4 shows the results of the variable correlation analysis in this survey. There is a significant positive correlation ( $p < 0.01$ ) among the four dimensions, indicating that there is an inherent connection between cultural identity and algorithmic perception among the respondents. The highest correlation coefficient ( $r = 0.276^{**}$ ) was observed between the identification of rural nostalgia and the identification of the reality of suffering, indicating a strong commonality between the two in terms of emotions and values. The correlation between fusion innovation identity and the other three dimensions is relatively weak, indicating its independence in cultural attitudes. Overall, there is a significant cultural psychological linkage between different dimensions of identity, and algorithmic perception plays an auxiliary rather than a core role in the cultural identity framework. In addition, the correlation coefficient between algorithm perception and influence and fusion innovation identification is  $0.084^{**}$ , indicating that algorithm exposure has a significant positive impact on users' fusion innovation identification, i.e., hypothesis 1 holds true.

## 4.2 Difference test results

Table 5 shows the results of the analysis of variance for commonly used short video platforms. The results showed that there were significant differences ( $p < 0.01$ ) among users of different short video platforms in all four dimensions. Kwai and Tiktok users scored the highest in their nostalgic identification and integrated innovation identification, indicating that these two types of platforms can better stimulate the audience's rural emotion and innovation acceptance. The relatively low scores of users on Xiaohongshu may be related to its content being biased toward urban lifestyles. Overall, platform type has a significant association with cultural identity, indicating that differences in content ecology are associated with different cultural perceptions and value orientations. Hypothesis 2 holds true.

Table 6 shows the t-test analysis results of "registered residence registration type". The results showed that there were significant differences between urban and rural registered residence registration groups in four dimensions ( $p < 0.01$ ), and the average value of rural registered residence registration respondents was significantly higher than that of urban registered residence respondents. Among them, the difference in rural nostalgia identification is the most obvious ( $t = 36.079$ ), indicating that individuals with rural backgrounds have a deeper level of identification with rural culture and emotions. The perception and influence of algorithms are also stronger in rural populations, which may be related to their greater reliance on algorithm content to obtain rural information. The results reveal that urban-rural background is an important social factor associated with cultural identity differences, and hypothesis 3 holds true.

Table 7 shows the results of the analysis of variance for 'permanent residence'. The results showed that there were significant differences ( $p < 0.001$ ) in cultural identity and algorithmic perception among respondents from different residential areas. With the improvement of urbanization level in residential areas, there is a significant decline in the identification of nostalgia and hardship reality in rural areas, indicating that urban life is associated with weakening individuals' emotional connection with rural areas. The high score of integration and innovation identification between rural and township groups indicates that they hold a relatively positive attitude toward the modern transformation of traditional culture. The overall results indicate that the regional environment profoundly influences cultural attitudes and algorithmic perception differences, and hypothesis 4 holds true.

Table 8 shows the results of the analysis of variance for 'education level'. The results showed that educational level significantly influenced cultural identity ( $p < 0.01$ ). The group of junior high school students and below have the highest identification with local nostalgia and the reality of hardship, while the group of graduate students and above have the lowest, indicating that educational improvement may be associated with weakening emotional cultural attachment. Hypothesis 5 holds true. The small gap in integration innovation identification among different educational levels indicates that innovative thinking is more common among different educational backgrounds. In terms of algorithm perception, highly educated individuals score lower, reflecting their more rational and critical attitude toward algorithm recommendations.

## 4.3 Regression analysis

Table 9 shows the regression results of rural natural scenery and cultural identity. The results showed that local nostalgia identification ( $\beta = 0.218, p < 0.01$ ) had the most significant positive impact on

TABLE 3 Descriptive statistical results of variables.

Name	Sample size	Minimum	Maximum	Average	Standard deviation	Median
Local nostalgia identification	1,200	1.500	6.500	4.182	0.920	4.250
Identification with the reality of suffering	1,200	1.500	6.500	4.038	0.717	4.000
Integration of innovation and identification	1,200	2.250	6.250	4.341	0.613	4.250
Algorithm perception and influence	1,200	1.600	5.600	3.562	0.642	3.600

TABLE 4 Correlation analysis.

Name	Local nostalgia identification	Identification with the reality of suffering	Integration of innovation and identification	Algorithm perception and influence
Local nostalgia identification	1			
Identification with the reality of suffering	0.276**	1		
Integration of innovation and identification	0.215**	0.135**	1	
Algorithm perception and influence	0.188**	0.104**	0.084**	1

TABLE 5 Results of analysis of variance.

Name	Common short video platforms (mean ± standard deviation)				F	p
	Others (n = 109)	Little Red Book (n = 292)	Kwai (n = 329)	Tiktok (n = 470)		
Local nostalgia identification	4.16 ± 0.90	3.89 ± 0.91	4.36 ± 0.92	4.25 ± 0.89	15.513	<0.001**
Identification with the reality of suffering	4.05 ± 0.68	3.91 ± 0.67	4.08 ± 0.72	4.08 ± 0.75	3.888	0.009**
Integration of innovation and identification	4.33 ± 0.64	4.22 ± 0.59	4.38 ± 0.61	4.39 ± 0.61	5.507	0.001**
Algorithm perception and influence	3.59 ± 0.66	3.43 ± 0.63	3.59 ± 0.64	3.62 ± 0.64	5.663	0.001**

\*p < 0.05; \*\*p < 0.01.

“content preference - rural natural scenery”, followed by fusion innovation identification ( $\beta = 0.076, p < 0.01$ ) and hardship reality identification ( $\beta = 0.062, p < 0.05$ ). The overall model was significant ( $F = 31.320, p < 0.001$ ), with moderate explanatory power (adjusted  $R^2 = 0.071$ ). The stronger the respondents’ identification with local emotions, the higher their preference for rural natural scenery content. The VIF values of each variable are all below 1.2, eliminating the problem of multicollinearity, and the model is stable and reliable.

## 5 Discussion

This chapter aims to provide theoretical interpretation of empirical research findings and examine quantitative analysis results from the theoretical perspectives of urban-rural relations, digital divide, and cultural identity. The research findings reveal the complex role of platform algorithms in the construction of urban and rural cultural identity, reflecting both the agency of technology intermediaries and

TABLE 6 Results of t-test analysis.

Name	Registered residence type (mean ± standard deviation)		t	p
	Agricultural household registration (rural registered residence) (n = 600)	Non-agricultural household registration (urban registered residence) (n = 600)		
Local nostalgia identification	4.85 ± 0.57	3.52 ± 0.69	36.079	<0.001**
Identification with the reality of suffering	4.31 ± 0.65	3.76 ± 0.67	14.480	<0.001**
Integration of Innovation and Identification	4.54 ± 0.55	4.15 ± 0.61	11.639	<0.001**
Algorithm perception and influence	3.71 ± 0.63	3.41 ± 0.62	8.457	<0.001**

\*p < 0.05; \*\*p < 0.01.

TABLE 7 Results of analysis of variance.

Name	Permanent residence (mean ± standard deviation)					F	p
	Township (n = 215)	Rural areas (n = 248)	County town or county-level city (n = 206)	Prefecture-level city (n = 199)	Provincial capital city or municipality directly under the central government (n = 332)		
Local nostalgia identification	4.62 ± 0.76	4.80 ± 0.64	4.27 ± 0.91	3.84 ± 0.88	3.59 ± 0.76	110.365	<0.001**
Identification with the reality of suffering	4.20 ± 0.68	4.30 ± 0.66	4.09 ± 0.73	3.91 ± 0.69	3.78 ± 0.70	25.848	<0.001**
Integration of innovation and identification	4.47 ± 0.61	4.52 ± 0.57	4.40 ± 0.54	4.26 ± 0.62	4.13 ± 0.61	20.038	<0.001**
Algorithm perception and influence	3.69 ± 0.59	3.73 ± 0.65	3.55 ± 0.64	3.43 ± 0.63	3.44 ± 0.64	12.353	<0.001**

\*p < 0.05; \*\*p < 0.01.

the sustained impact of social structure. The following discussion will be conducted from three levels: theoretical dialogue, practical insights, and research limitations, in order to gain a deeper understanding of the cultural and political formation of urban and rural areas in the digital age.

### 5.1 Theoretical interpretation of research findings

This study verified the significant impact of platform algorithms on urban–rural cultural identity through quantitative analysis, which is consistent with the latest evolution of digital divide theory. Traditional research on the digital divide often focuses on inequalities in access and usage, while this study reveals the existence of a “cognitive divide”: algorithmic recommendation systems, through content

filtering mechanisms, are differentially associated with users’ imagination and identification with rural areas. Specifically, the fusion innovation identification of users with high algorithm exposure is significantly enhanced, indicating that technology intermediaries may be associated with promoting the acceptance of rural modernity; The negative correlation between active search behavior and nostalgic identification implies the buffering effect of user autonomy in resisting algorithmic narratives. These findings form a dialogue with the recently proposed “algorithm domestication” theory by scholars, which suggests that technology is not a neutral tool, but is actively associated with the construction process of social cognition.

The regulatory effect of urban and rural registered residence has further deepened our understanding of the interaction between digital technology and social structure. Rural registered residence urban residents show a unique mode of realistic identity. Their strength of

TABLE 8 Results of analysis of variance.

Name	Educational level (mean ± standard deviation)					F	p
	Junior high school and below (n = 224)	Associate degree (n = 291)	Undergraduate (n = 318)	Graduate students and above (n = 97)	High school/vocational school (n = 270)		
Local nostalgia identification	4.74 ± 0.74	4.13 ± 0.92	3.81 ± 0.84	3.58 ± 0.76	4.42 ± 0.87	58.345	<0.001**
Identification with the reality of suffering	4.27 ± 0.72	3.98 ± 0.71	3.90 ± 0.69	3.78 ± 0.67	4.17 ± 0.70	15.342	<0.001**
Integration of innovation and identification	4.56 ± 0.59	4.28 ± 0.61	4.22 ± 0.62	4.26 ± 0.54	4.40 ± 0.59	12.306	<0.001**
Algorithm perception and influence	3.70 ± 0.67	3.53 ± 0.64	3.50 ± 0.59	3.35 ± 0.67	3.62 ± 0.64	6.912	<0.001**

\*p < 0.05; \*\*p < 0.01.

TABLE 9 Regression analysis results of rural natural scenery and cultural identity (n = 1,200).

Name	Non-standardized coefficient		Standardization coefficient	t	p	Collinearity diagnosis	
	B	Standard error	Beta			VIF	Tolerance
Constant	0.912	0.248	-	3.682	<0.001**	-	-
Local nostalgia identification	0.240	0.032	0.218	7.394	<0.001**	1.122	0.891
Identification with the reality of suffering	0.087	0.041	0.062	2.117	0.034*	1.090	0.918
Integration of innovation and identification	0.125	0.047	0.076	2.645	0.008**	1.055	0.947
R <sup>2</sup>	0.073						
Adjust R <sup>2</sup>	0.071						
F	F(3,1,196) = 31.320, p = 0.000						
D-W value	2.013						

Dependent variable = Content preference \_ Rural natural scenery.

\*p < 0.05, \*\*p < 0.01.

realistic identity of suffering is lower than that of rural residents, but higher than that of urban registered residence groups. This phenomenon may reflect the “dual detachment” dilemma of urban and rural immigrants in cultural identity: they are both alienated from traditional local culture and difficult to fully integrate into the mainstream urban narrative. From the perspective of migration studies, this dilemma is a typical manifestation of the asynchrony between “physical domicile migration” and “migration of the mind”—rural–urban migrants may have completed physical relocation but not yet achieved cognitive and cultural integration, or their “migration of the mind” is still in a state of negotiation. The algorithm platform, as a digital intermediary, may either alleviate or exacerbate this asynchrony through the content it disseminates. The algorithm platform becomes a space

for identity negotiation in this process, but its content distribution logic may be associated with exacerbating this sense of tearing. For example, excessive exaggeration of the “rural dilemma” or beautification of the “pastoral romance” may be associated with strengthening the cultural imagination of urban–rural binary opposition. This study validated this differentiation mechanism through quantitative data, providing new empirical evidence for the study of urban–rural identity politics.

Notably, this study’s findings align with core insights from migration studies: the two types of migration (physical and psychological) can facilitate each other, and “migration of the mind” may precede physical domicile migration. For instance, rural residents with high algorithm exposure show stronger fusion innovation identification

(acceptance of rural modernity), which may lay the cognitive foundation for their future physical migration to cities; Conversely, rural-urban migrants with weak algorithm exposure may retain stronger rural nostalgia, hindering their “migration of the mind” and cultural integration into cities. This mutual facilitation highlights the common variables between the two fields—such as social position, cultural capital, and environmental adaptation—and enriches the theoretical connotation of both digital cultural divide research and migration studies.

Furthermore, subgroup-level analysis under the digital rural-urban continuum confirms the existence of “echo-chambers,” “filter bubbles,” and “groupthink.” For example, subgroup analysis of rural users with low education level shows that they are more dependent on algorithm recommendations, and their cultural identity is highly consistent with the homogeneous rural narratives pushed by algorithms, forming obvious “echo-chambers”; Urban users who hold negative attitudes toward rural areas are often trapped in “filter bubbles” where algorithms continuously recommend negative rural content, and “groupthink” in online communities further strengthens their biased cognition. These phenomena indicate that the digital rural-urban continuum does not eliminate cognitive barriers, but rather reproduces or even strengthens them through algorithmic mechanisms, making policy-level intervention necessary and urgent.

In addition, the moderating effect of education level and platform type is not significant, which may reflect the complexity of digital culture infiltration. On the one hand, although the highly educated group has stronger information criticism ability, their acceptance of algorithm content may not be lower than that of the low educated group, which is different from the linear deduction of the traditional “knowledge gap” assumption. On the other hand, although there are differences in the content ecology of different platforms, their underlying algorithmic logic may converge, leading to consistency in the shaping effect of cultural identity. These findings suggest that cultural politics in the digital age is not only constrained by individual or platform characteristics, but also closely related to the overall operational mechanism of algorithmic capitalism.

## 5.2 Exploration of practical significance

This study has important implications for the construction of digital rural areas and platform governance. Firstly, policy design needs to go beyond the scope of infrastructure construction and focus on algorithmic ethics and cultural justice. The current digital rural strategy mainly focuses on network coverage and e-commerce promotion, while the governance of platform content ecology is relatively lagging behind. Research has shown that algorithmic recommendations may be associated with influencing social cognition by reinforcing specific narratives, therefore it is necessary to establish an algorithmic transparency mechanism to avoid the singularity or stereotyping of cultural representations in urban and rural areas. For example, the platform can be required to publicly disclose basic recommendation principles and establish evaluation indicators for urban and rural content diversity.

In response to the “echo-chambers,” “filter bubbles,” and “groupthink” phenomena found in subgroup analysis, policy-level intervention should be targeted and precise. Specifically, the government can issue regulatory guidelines requiring short video platforms to establish a “content diversity guarantee mechanism”—for example, setting a minimum proportion (e.g., 30%) of

cross-cultural narrative content in algorithm recommendations, forcing the penetration of heterogeneous information to break closed cognitive circles. For high-risk subgroups (such as rural low-education groups and urban groups with extreme rural attitudes), platforms can be guided to carry out targeted content intervention, such as pushing neutral urban-rural integration cases and objective rural development reports to balance their cognitive biases.

Secondly, the cultivation of digital literacy should focus on the development of critical thinking. Research has shown a negative correlation between active search behavior and nostalgic identification, suggesting that user autonomy may be associated with alleviating the one-way impact of algorithms. In addition to skill training, educational programs should strengthen the cultivation of media criticism ability, help users, especially rural residents, rationally examine algorithm content, and form independent cultural judgments. Specific measures may include incorporating digital literacy into the rural adult education system, developing training modules for algorithm cognition, and encouraging communities to conduct digital narrative workshops to empower villagers to independently create and disseminate local content.

From the perspective of migration governance, the research findings also provide practical enlightenment: policies should pay attention to the synergy between “physical migration” and “migration of the mind”. For rural residents with migration intentions, platform algorithms can be guided to push more content about urban cultural adaptation and rural modernization integration, helping them complete “migration of the mind” in advance; For rural-urban migrants who have completed physical migration, algorithms can be optimized to recommend content that connects urban and rural cultures, promoting their cultural integration and reducing the “dual detachment” dilemma. This synergy can improve the quality of urban-rural migration and promote more inclusive urban-rural integration.

Finally, urban-rural digital inclusion policies need to pay attention to group differences. The identification dilemma of rural registered residence urban residents suggests that policies should support the cultural adaptation of cross-border groups. For example, the platform can develop thematic content that connects urban and rural areas, showcasing successful cases of urban-rural integration; The public service sector can use algorithm technology to provide customized information support for urban and rural immigrants, helping them integrate multicultural identities. In addition, creators should be encouraged to produce content that reflects the complexity of urban-rural interaction, avoiding simplifying rural areas as nostalgic objects or problem carriers.

## 5.3 Research limitations and future directions

This study has several limitations and provides direction for future research. Firstly, cross-sectional design is difficult to establish causal relationships. Although statistical tests support the correlation between algorithmic exposure and cultural identity, both may be influenced by unobserved variables. Future research can use longitudinal tracking or experimental methods to more clearly reveal its causal effects through algorithmic exposure. For example, A/B testing can be designed to compare the changes in user identification under different recommendation strategies.

Secondly, there is room for optimization in sample representativeness. Although stratified sampling is used, the online sample library may not cover enough groups with lower digital skills. The mechanism of cultural identity formation among digitally disadvantaged groups such as rural elderly population and low education groups still needs to be further explored through qualitative methods. Future research can combine ethnographic interviews and participatory observation to capture experiences and meanings that are difficult to quantify and analyze.

Thirdly, the measurement of algorithm exposure has certain limitations. Although this study justifies the use of “perceived dependence on algorithmic recommendations” as a proxy indicator, this measure may conflate algorithmic influence with user preference or habit to a certain extent. Alternative measurement strategies can be adopted in future research, such as objective indicators like content diversity in users’ viewing history, feed homogeneity, or algorithmic recommendation frequency obtained through platform data authorization, to more accurately capture the connotation of algorithmic exposure.

In addition, although the measurement of cultural identity has undergone differential testing, its dimensional division may not fully cover the complexity of identity in the digital age. For example, algorithms may be associated with giving rise to new forms of identity such as “mixed identity.” Future research can develop more dynamic measurement tools, combined with big data analysis of user generated content, to capture the variability of cultural identity. At the same time, the impact of algorithms in different cultural contexts can be compared to test the cross-cultural applicability of the conclusions of this study.

Finally, the platform algorithm updates rapidly, and its social impact is also in a dynamic evolution. This study captured the effects of specific technological stages, but long-term trends still need to be continuously tracked. It is recommended to establish a monitoring system for digital cultural identity, regularly evaluate the social consequences of technological changes, and provide a basis for policy adjustments.

## 6 Conclusion

This chapter aims to systematically summarize the main findings of this study, clarify their significance at the theoretical and policy levels, and reflect on the limitations and future directions of the research. Through empirical analysis of how short video platform algorithms affect urban and rural cultural identity, this study attempts to provide new perspectives and evidence for understanding urban and rural cultural politics in the digital age.

### 6.1 Summary of research conclusion

This study systematically examined the role of short video platform algorithms in shaping urban and rural cultural identity through quantitative analysis methods. Research has found a significant positive correlation between algorithm exposure and fusion innovation identification, indicating that algorithm recommendation mechanisms are associated with a certain role in promoting user acceptance of rural modernity narratives. However, the impact of usage duration on reality identification did not reach statistical significance, indicating the existence of dimensional differences in algorithm effects.

Active search behavior is negatively correlated with nostalgic identification, indicating that user autonomy may play a moderating role in resisting algorithmic storytelling. Urban and rural registered residence shows a significant moderating effect in the relationship between algorithm exposure and real identity. Rural registered residence urban residents show a unique identity model, reflecting the “double disembedded” dilemma of urban and rural migrants in cultural identity. The difference in the impact of platform types on cultural identity is not significant, which may suggest a convergence phenomenon in the algorithmic logic of mainstream platforms. Notably, the study’s findings align with migration studies’ core insights: algorithm-mediated cultural identity changes (a form of “migration of the mind”) are closely associated with physical urban–rural migration, and the two may facilitate each other—with “migration of the mind” potentially preceding physical migration. Additionally, subgroup-level analysis confirms that despite the convenience brought by the digital rural–urban continuum, “echo-chambers,” “filter bubbles,” and “groupthink” still exist among specific user groups, highlighting the necessity of policy intervention. These findings collectively indicate that platform algorithms are neither completely neutral tools nor a single decisive force, but rather cultural and political participants that interact with user characteristics in specific social contexts.

### 6.2 Theoretical contributions

This study attempts to make subtle academic efforts in the following areas. Firstly, introducing algorithmic factors into the study of urban–rural cultural identity breaks through the limitations of traditional analysis that focuses on economic or institutional factors, providing a new entry point for the study of urban–rural relations in the digital age. Secondly, by constructing an operable three-dimensional measurement scale of cultural identity, an analytical framework connecting macro cultural politics and micro user behavior was established, providing methodological references for quantitative analysis of subsequent related research. Thirdly, the “cultural identity construction model mediated by algorithms” was proposed and validated, revealing the inherent path through which algorithms are associated with urban–rural identity through mechanisms such as content filtering, user profiling, and interactive reinforcement, enriching the cultural dimension of digital divide theory. More importantly, this study explicitly defines the core connotation of the “digital cultural divide” as a multi-dimensional cognitive gap composed of differences in algorithmic exposure, differentiation in cultural content interpretive capacity, and divergence in downstream cultural identity outcomes, and clarifies the intrinsic connection between the “Algorithm Domestication Gap” and existing digital divide and knowledge gap theories—this not only makes up for the lack of clear conceptual definition in existing research but also provides a more precise theoretical basis for the analysis of digital cultural differentiation. Fourthly, this study pioneers the integration of digital cultural identity research with migration studies. By framing algorithm-mediated cultural identity changes as a digital-era “migration of the mind”, it reveals the interactive relationship between this form of psychological migration and physical urban–rural migration, and identifies shared core variables (social position, cultural adaptation, identity negotiation) between the two fields. This integration enriches the theoretical dialogue between digital technology research and migration studies, expanding the application scope of both theories and providing a new cross-disciplinary perspective for understanding urban–rural dynamics in the

digital age. Fifthly, this study supplements the theoretical research on the digital rural–urban continuum by focusing on subgroup-level risks. It confirms that the continuum does not eliminate cognitive barriers but may breed “echo-chambers,” “filter bubbles,” and “group-think” through algorithmic mechanisms, expanding the understanding of the negative effects of digital technology in urban–rural integration and providing a new theoretical basis for policy intervention in the digital age. Although these theoretical explorations are preliminary, they may provide useful references for understanding the new forms of urban and rural cultural politics in the algorithmic society.

### 6.3 Practical insights

The research findings have several implications for the construction of digital rural areas and platform governance. At the policy level, we should go beyond simple infrastructure construction thinking and focus on algorithmic ethics and digital cultural justice. Suggest incorporating algorithm transparency and inclusiveness evaluation into the digital rural policy system, encouraging platforms to optimize recommendation mechanisms, and avoiding the singularity or stereotyping of urban and rural cultural representations. In terms of platform governance, a more fair content creation incentive system should be established to support diverse rural narratives, especially the cultural expression of marginalized groups such as returning youth and rural women. In the field of education, it is necessary to strengthen the cultivation of media literacy among urban and rural residents, especially their ability to criticize algorithms, and help users form a more reflective cultural identity. From the perspective of migration governance, the findings suggest that policies should promote the synergy between “physical migration” and “migration of the mind”. For rural residents with migration intentions, guide platforms to push content that facilitates cultural adaptation and modernity acceptance; for rural–urban migrants, optimize algorithms to provide multicultural integration content, reducing identity dissonance. This synergy can improve migration quality and promote inclusive urban–rural integration.

In response to subgroup-level cognitive risks, targeted policy interventions are essential. It is recommended to establish a tripartite supervision mechanism involving government, platforms, and academic institutions: the government formulates content diversity standards and supervision rules; platforms implement algorithm optimization and subgroup intervention measures; academic institutions conduct regular evaluation and effectiveness tracking. For example, platforms can be required to submit annual reports on the diversity of urban–rural content recommendations, and the government can impose penalties for non-compliance, ensuring that policy intervention is implemented effectively. These measures may help guide digital technology to better serve urban–rural integration and rural revitalization.

### 6.4 Overview of research limitations and future directions for exploration

This study has several limitations and provides direction for future research. Firstly, although cross-sectional design can reveal variable associations, it is difficult to establish causal

relationships. Future research can use longitudinal tracking or experimental methods to more clearly reveal the dynamic process of algorithm influence. Secondly, although the sample strives for representativeness, it may not fully cover the marginalized groups with lower levels of digital access. Future research can combine in-depth interviews and participatory observation to capture experiential dimensions that are difficult to quantify and analyze. Thirdly, the measurement of algorithm exposure can be further optimized. This study uses “perceived dependence on algorithmic recommendations” as a proxy variable, which may inevitably conflate algorithmic influence with user preference or habit. Future research can combine objective data (such as content diversity, feed homogeneity) and subjective perception to construct a more comprehensive measurement system of algorithmic exposure, and verify the robustness of the research conclusions through multi-method triangulation. Fourthly, future research can deepen the integration with migration studies by incorporating variables such as migration intention, migration history, and integration status. This will enable empirical testing of the causal direction between “migration of the mind” and physical migration, and explore the boundary conditions of their interaction. Additionally, cross-cultural comparative studies can be conducted to test the generalizability of the findings across different migration contexts. Fifthly, future research can focus on the dynamic evolution and intervention effects of “echo-chambers,” “filter bubbles,” and “groupthink” among subgroups. For example, using experimental designs to test the effectiveness of different policy intervention measures (such as content diversity mandates, critical literacy training) in breaking cognitive closure, and providing more precise policy tools for digital urban–rural integration governance. Sixthly, although the measurement of cultural identity has been tested for reliability and validity, its complexity and variability may exceed the scope of current operational frameworks. Future research could develop more sensitive measurement tools or combine big data analysis with user generated content to comprehensively grasp the process of identity construction. In addition, the platform algorithm updates rapidly, and its social impact is also in a dynamic evolution, requiring the establishment of a long-term monitoring mechanism to capture the social consequences of technological changes.

### Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author/s.

### Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants [OR participants legal guardian/next of kin] provided their written informed consent to participate in this study.

## Author contributions

CY: Writing – review & editing, Project administration, Investigation, Validation, Data curation, Writing – original draft, Software, Methodology, Conceptualization, Resources. GJ: Writing – original draft, Investigation, Writing – review & editing, Data curation, Funding acquisition.

## Funding

The author(s) declared that financial support was received for this work and/or its publication. The study was funded by the 2024 National Social Science Foundation's youth project of China. "Research on the practical challenges, dynamic mechanism and optimization path of the integrated development of urban and rural spiritual civilization construction" (Grant No: 24CKS057, Gao Jiayao).

## Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## References

- Airoidi, M. (2024). Theories and dimensions of algorithmic power, between agency and domination. *Scienza Politica-Per Una Storia Delle Dottrine* 36, 49–63. doi: 10.6092/issn.1825-9618/19863
- Aytac, U. (2024). Big tech, algorithmic power, and democratic control. *J. Polit.* 86, 1431–1445. doi: 10.1086/729938
- Belanche, D., Casalo, L. V., and Rubio, M. A. (2021). Local place identity: a comparison between residents of rural and urban communities. *J. Rural. Stud.* 82, 242–252. doi: 10.1016/j.jrurstud.2021.01.003
- Bernardo, F. (2023). Group identity activation and sustainable behaviour in generation Z. *Psicol. Soc.* 18, 341–358. doi: 10.1482/108585
- Bin, S. (2024). An E-commerce personalized recommendation algorithm based on multiple social relationships. *Sustainability* 16, 1–16. doi: 10.3390/su16010362
- Chan, S. H. G., Lee, W. H. H., Tang, B. M., and Chen, Z. Y. (2024). Legacy of culture heritage building revitalization: place attachment and culture identity. *Front. Psychol.* 14:1314223. doi: 10.3389/fpsyg.2023.1314223
- Chen, W. P., Sun, X., and Liu, J. J. (2025). How does digital governance platform usage impact social trust in rural areas? Empirical evidence from rural China. *J. Rural. Stud.* 119, 1–17. doi: 10.1016/j.jrurstud.2025.103783
- Consolati, I. (2023). For A Semantic Of Algorithmic Power. *Filosofia Politica* 37, 329–342. doi: 10.1416/107450
- Croucher, S. M., Li, M., Huang, Y., Pan, X., Yuan, G., and Kou, Y. (2023). Developing media and information literacy competencies: a case study in rural schools in Yunnan Province, China. *J. Appl. Commun. Res.* 51, 72–90. doi: 10.1080/00909882.2022.2075236
- D'Amato, K. (2025). ChatGPT: towards AI subjectivity. *AI & Soc.* 40, 1627–1641. doi: 10.1007/s00146-024-01898-z
- Gorwa, R., Binns, R., and Katzenbach, C. (2020). Algorithmic content moderation: technical and political challenges in the automation of platform governance. *Big Data Soc.* 7:205395171989794. doi: 10.1177/2053951719897945
- Gritsenko, D., and Wood, M. (2022). Algorithmic governance: a modes of governance approach. *Regul. Gov.* 16, 45–62. doi: 10.1111/rego.12367
- Gutiérrez, J. (2022). Symbolic power, illusio and affectivity in the sociology of Pierre Bourdieu. *Convergencia* 29, 1–26. doi: 10.29101/crcs.v29i0.17878
- Hannah-Moffat, K. (2019). Algorithmic risk governance: big data analytics, race and information activism in criminal justice debates. *Theor. Criminol.* 23, 453–470. doi: 10.1177/1362480618763582

## Generative AI statement

The author(s) declared that Generative AI was not used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

## Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fhumd.2026.1736838/full#supplementary-material>

- Issar, S., and Aneesh, A. (2022). What is algorithmic governance? *Sociol. Compass* 16, 1–14. doi: 10.1111/soc4.12955
- Jing, G. H. (2024). Examining the nexus between local governance structures and college students cultural identity and confidence-take Zhejiang as an example. *Lex Localis* 22, 153–174. doi: 10.52152/22.1.153-174(2024)
- Ju, B., Sandel, T. L., and Chen, H. T. (2024). Overt conviviality and covert distress: navigating the emotional experiences of left-behind women via Douyin in rural China. *Convergence* 32, 159–177. doi: 10.1177/13548565241246082
- Kent, M. L., and Li, C. Y. (2020). Toward a normative social media theory for public relations. *Public Relat. Rev.* 46, 1–10. doi: 10.1016/j.pubrev.2019.101857
- Lee, B. D., Lee, K. H., Han, S. S., and Jeong, C. S. (2021). Reproduction based multi-contents distribution platform. *KSII Trans. Internet Inf. Syst.* 15, 695–712. doi: 10.3837/tis.2021.02.017
- Li, G. (2024). The heterogeneous impact of digital technology utilization on rural household income: evidence from China. *J. Knowl. Econ.* 16, 7325–7349. doi: 10.1007/s13132-024-02165-8
- Li, B. J. (2025). A philosophical analysis of the art market in the digital age: historical identity, sacred narratives, and contemporary value. *Eur. J. Phil. Of Relig.* 17, 49–65. doi: 10.24204/EJPR.2025.4302
- Liu, D. D., and Fan, G. R. (2025). Digital duality: negotiating tradition, modernity, and identity among rural housewife Douyin creators in China. *Inf. Commun. Soc.* 28, 3086–3103. doi: 10.1080/1369118x.2025.2496903
- Liu, B., Zhan, J., and Zhang, A. X. (2023). Empowering rural human settlement: digital economy's path to progress. *J. Clean. Prod.* 427, 1–12. doi: 10.1016/j.jclepro.2023.139243
- Ma, W. L., Qiu, H. G., and Rahut, D. B. (2023). Rural development in the digital age: does information and communication technology adoption contribute to credit access and income growth in rural China? *Rev. Dev. Econ.* 27, 1421–1444. doi: 10.1111/rode.12943
- Miocevic, D., Brecic, R., and Zdravkovic, S. (2022). Exploring the chain of effects between local identity and expatriate consumers' preference for local food brands. *J. Prod. Brand. Manag.* 31, 718–730.
- Niezzoda, A., and Szymanska, E. (2024). Local identity and residents' attitudes towards innovation in sustainable tourism - the example of generation Z. *Econom. Environ.* 89, 1–10. doi: 10.34659/eis.2024.89.2.760

- O'Reilly, T., Strauss, I., and Mazzucato, M. (2024). Algorithmic attention rents: a theory of digital platform market power. *Data Policy* 6, 1–25. doi: 10.1017/dap.2024.1
- Peterson-Salahuddin, C. (2024). Repairing the harm: toward an algorithmic reparations approach to hate speech content moderation. *Big Data Soc.* 11, 1–13. doi: 10.1177/20539517241245333
- Pitt, J., Dryzek, J., and Ober, J. (2020). Algorithmic reflexive governance for socio-techno-ecological systems. *IEEE Technol. Soc. Mag.* 39, 52–59. doi: 10.1109/mts.2020.2991500
- Poti, S. P., Stanton, C. J., and Stevens, C. J. (2026). Enabling ethics mechanisms in the governance of algorithmic artificial persons (ALAP). *J. Responsible Technol.* 25, 1–18. doi: 10.1016/j.jrt.2025.100143
- Qi, M., Zhang, B., Li, J., and Liu, B. (2023). The three-dimensional analytical and governance logic of China's digital divide bridging policy. *Sustainability* 15, 1–24. doi: 10.3390/su15097220
- Riordan, C. A., Rho, H. J., Hur, Y., Tabarani, P., and Figart, D. M. (2025). Building power from the bottom-up: how union leaders navigate power relations under algorithmic management. *Br. J. Ind. Relat.* doi: 10.1111/bjir.70025
- Sovetova, N. P. (2021). Rural territories' digitalization: from theory to practice. *Econ. Soc. Chang.-Facts Trends Forecast* 14, 105–124. doi: 10.15838/esc.2021.2.74.7
- Strizhakova, Y., and Coulter, R. (2019). Consumer cultural identity: local and global cultural identities and measurement implications. *Int. Mark. Rev.* 36, 610–627. doi: 10.1108/imr-11-2018-0320
- Ting, C. (2016). The role of awareness in internet non-use: experiences from rural China. *Inf. Dev.* 32, 327–337. doi: 10.1177/0266666914550425
- Tironi, M., and Lisboa, D. (2023). Artificial intelligence in the new forms of environmental governance in the Chilean state: towards an eco-algorithmic governance. *Technol. Soc.* 74, 1–12. doi: 10.1016/j.techsoc.2023.102264
- Wang, M. J., and Liu, J. X. (2025). Deciphering the digital divide: the heterogeneous and nonlinear influence of digital economy on urban-rural income inequality in China. *Appl. Econ.* 57, 4861–4881. doi: 10.1080/00036846.2024.2364101
- Wang, Y. N., and Sandner, J. (2019). Like a "frog in a well"? An ethnographic study of Chinese rural women's social media practices through the WeChat platform. *Chin. J. Commun.* 12, 324–339. doi: 10.1080/17544750.2019.1583677
- Wang, Y. H., Wang, Y., Xiao, C., Zheng, Y., Liu, Z., Jiang, Z., et al. (2025). Shaping local identity through public health: the role of social integration among new-generation rural migrants in urban China. *BMC Public Health* 25:2643. doi: 10.1186/s12889-025-24038-8
- Wang, J. F., and Wu, X. L. (2022). Personalized original ecotourism route recommendation based on ant colony algorithm. *Wirel. Commun. Mob. Comput.* 2022, 1–9. doi: 10.1155/2022/6783567
- Wang, Q., Xia, X., Lan, S., and Li, M. (2023). Rural digital infrastructure and labor market: evidence from universal telecommunication service. *Asian Econ. J.* 37, 293–325. doi: 10.1111/asej.12306
- Wang, Y. Z., and Zhang, Z. T. (2025). Digital development and rural financial inclusion: evidence from China. *Res. Int. Bus. Finance* 73, 1–13. doi: 10.1016/j.ribaf.2024.102637
- Wang, M., Zhong, Q. Y., Chen, B. R., Lin, Y. C., and Xie, Y. (2025). Digital technology and post-rural: rural restructuring in Guangzhou, China. *Geogr. Rev.* 167, 1–27. doi: 10.1080/00167428.2025.2512731
- Yan, Y. C., Yan, Y., Cheng, L., Lin, Q., and He, Q. (2023). Promoting or inhibiting: the impact of China's urban-rural digital divide on regional environmental development. *Environ. Sci. Pollut. Res.* 30, 112710–112724. doi: 10.1007/s11356-023-30346-6
- Yang, T., Zhang, H. C., and Wang, H. M. (2025). Addressing territorial digital divide through digital policy: lessons from China's national comprehensive big data pilot zones. *Inf. Technol. Dev.* 31, 577–603. doi: 10.1080/02681102.2024.2402984
- Yin, J. (2024). Application of intelligent image recognition and digital media art in the inheritance of black pottery intangible cultural heritage. *ACM Trans. Asian Low-Resour. Lang. Inf. Process.* 23, 1–15. doi: 10.1145/3597430
- Yuan, Y., Fong, E., Li, S. Z., and Yue, Z. S. (2022). Local resident composition in the community and local identity among rural migrants in Guangzhou, China. *Asian J. Soc. Sci.* 50, 112–121. doi: 10.1016/j.ajss.2021.06.007
- Zhang, J., and Li, M. N. (2024). Digital technology access, labor market behavior, and income inequality in rural China. *Heliyon* 10, 1–25. doi: 10.1016/j.heliyon.2024.e33528
- Zhao, S. Y., Li, M. X., and Cao, X. (2024). Empowering rural development: evidence from China on the impact of digital village construction on farmland scale operation. *Land* 13, 1–19. doi: 10.3390/land13070903
- Zhou, X. L., Wang, Y. X., and Han, M. Y. (2025). Bridging the digital divide: how does rural digitalization promote rural common prosperity? *Front. Earth Sci.* 13:1591924. doi: 10.3389/feart.2025.1591924
- Zou, S. (2023). Curating a scopic contact zone: short video, rural performativity, and the mediatization of socio-spatial order in China. *Telev. New Media* 24, 452–470. doi: 10.1177/15274764221128925