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Accepting but not engaging with it: Digital participation in local government-run social credit systems in China

Haili Li | **Genia Kostka**

Institute for Chinese Studies, Freie Universität Berlin, Berlin, Germany

Correspondence

Genia Kostka, Institute for Chinese Studies, Freie Universität.
Email: g.kostka@fu-berlin.de

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Abstract

Over the past decade, China's central and municipal governments have consistently supported the development of social credit systems (SCSs). While research has highlighted the Chinese public's high approval and backing of SCSs, their engagement with these digital projects has not been fully explored. Based on 44 semi-structured interviews, our research examines Chinese citizens' digital participation in government-run SCSs at the local level. Our findings suggest that, despite perceiving SCSs as accepting and positive, most interviewees do not actively engage with local government-run SCSs. Multiple factors can explain the gap between the high acceptance and low participation rates, including a lack of awareness regarding local SCSs, a perception that registering and maintaining a decent credit score requires major effort, various concerns involving data privacy and safety, algorithm accuracy and fairness, potential risks, unappealing benefits offered by SCSs, and the voluntary aspect of participating in local SCSs. Our research adds to the existing literature on digital governance in authoritarian contexts by explaining why Chinese citizens do not necessarily engage with state-promoted digital projects.

KEYWORDS

awareness, barriers, digital participation, privacy concerns, social credit systems (SCSs)

INTRODUCTION

In 2014, the Chinese State Council published the *Planning Outline for the Construction of a Social Credit System (2014-2020)* (State Council, 2014), which asserts China's goal of creating a national social credit system (SCS) to enforce existing regulations and laws within the country. However, instead of a unified and standardized national SCS mechanism, many different local versions of SCSs have mushroomed across China. Existing studies highlight the fragmented localized practices in SCS development around the country and acknowledge that the implementation of a national SCS has been far from straightforward (Drinhausen & Brussee, 2021; Knight & Creemers, 2021).

A growing body of research has studied the various aspects of SCS development in China. Existing work examines the variety of SCSs (Creemers, 2018; Liu, 2019), their use for state surveillance (Lee, 2019; Liang et al., 2018) and digital governance (Zhang, 2020), SCSs' impact on Chinese society (Knight & Creemers, 2021; Kostka & Antoine, 2020), the issues and challenges they pose (Chen & Cheung, 2017; Ding & Zhong, 2021), and public perceptions of them (Kostka, 2019; Liu, 2022; Xu et al., 2022).

Studies of the public's perception of SCSs generally confirm high approval of and support for SCSs among the Chinese population (Kostka, 2019; Liu, 2022; Rieger et al., 2020), arguing that SCSs are perceived more as an instrument to fill regulatory or institutional gaps than as a tool for mass surveillance and repression. However, recent research reports suggest that only a small percentage of Chinese citizens participate in local SCSs: Reportedly, as little as 5% of citizens in Xiamen and 15% of citizens in Hangzhou have joined local government-run SCSs (Drinhausen & Brussee, 2021). This apparent inconsistency between the public's supportive attitude and the relatively low participation rate in local SCSs is puzzling. Furthermore, the Chinese central and local governments' substantial recent efforts to promote and implement SCSs versus the Chinese public's limited participation in these digital scoring systems make the puzzle even more salient. Our study examines why we see such low engagement with China's local government-led SCSs in everyday life despite people's generally high approval rates and the governments' consistent facilitation of SCSs.

The analysis draws on Technology Acceptance Models (TAMs), the Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of Innovations (DOI), the technology rejection framework, privacy calculus, and privacy paradox theories. We conducted 44 semi-structured interviews between 2021 and 2022 with Chinese citizens from a wide range of cities across the country to investigate their understanding of and individual practices for participating in local government-run SCSs. We used snowball sampling to recruit interview participants and conduct interviews in Mandarin Chinese either in their presence or via online methods (e.g., WeChat voice/video calls). We transcribed all the interviews into English, coded them according to different questions, and categorized them into different themes. Table A1 in the appendix summarizes the interviewees' demographic information. We further examined local SCS websites, digital platforms (e.g., SCS mobile apps, WeChat public accounts, and mini-programs launched by local authorities), news articles, and policy documents and guidelines associated with the local SCS design and implementation in different cities.

Our findings suggest that, despite demonstrating positive attitudes toward local SCSs, most of our interviewees did not actively engage with local government-run SCSs. Even for the few interviewees engaging with local SCSs, their digital practices primarily involved superficial, inactive, and reluctant participation. We argue that different kinds of barriers impede the interviewees' engagement with their local government-run SCSs to varying degrees, including their low level of awareness of the local government-run SCSs targeting individual residents, perceptions of requiring major efforts to register for and participate in

SCSs, various concerns regarding data privacy and security, algorithm accuracy, the fairness of the scoring system, potential risks, the limited benefits/usefulness of SCSs, and the (largely) voluntary nature of SCS participation.

Below, we first review the existing literature on SCSs and their implementation in China. Then we draw on related theories of users' technology perceptions and behaviors to outline our integrated theoretical framework. In the findings section, we unpack the details of interviewees' attitudes and practices regarding engagement with local government-run SCSs and the barriers hindering their participation in local SCSs.

LITERATURE REVIEW

SCSs and local implementation

Western media tend to portray the SCSs as a unified single national system, but some studies have corrected this misrepresentation by highlighting the multiplicity, variations, and complicated nature of the SCSs (Creemers, 2018; Liu, 2019). Liu (2019), for instance, analyzes and distinguishes the multiple SCSs at different levels and fields in Chinese society, including the nationwide blacklists and redlists developed by several central governmental agencies, the SCS pilots implemented by municipal governments in different cities and provinces targeting businesses, organizations, and/or individuals, and commercial SCSs like Zhima Credit[1] (also known as Sesame Credit). Many studies have explored SCSs designed by the central and local governments for rating business enterprises and business organizations via redlists and blacklists (Engelmann et al., 2021; Lin & Milhaupt, 2021). However, SCSs developed for individuals (e.g., ordinary citizens) have received much less attention from scholars. One explanation might be the imbalance between the local SCSs' targeting of business organizations and individuals. While the former have attracted more scholarly attention because their design has been implemented in an advanced, progressive, and mature manner, the latter have been relatively neglected, despite ongoing and increasing efforts to expand local SCSs for individuals (Tsai et al., 2021).

There are also continuing debates in the literature over the function and purpose of the SCSs implemented by the central or local governments. Prior research has highlighted the SCSs' role and function in state surveillance and argues that the Chinese government develops SCSs as a tool for digital surveillance and control (Lee, 2019; Liang et al., 2018). Liang et al. (2018), for example, conceptualize the SCS as a "state surveillance infrastructure" designed to govern and rule the various domains of society. Lee (2019) also suggests that the SCS is developed as "an integrated tool of datafication, dataveillance, and data-driven authoritarianism" to enable the government to strengthen its control and monitoring of the society, business, and population. Some research also uses Michel Foucault's term, "panopticon," as a metaphor to emphasize the SCS's nature of being a mass surveillance system (Laniuk, 2021).

Apart from its use in state monitoring, the SCS also functions as a mechanism for strengthening social governance (Zhang, 2020) and market order (Krause & Fischer, 2020). The Chinese government's goal is to govern social and economic activities, solve a wide range of existing social problems related to corruption, food safety, and commercial fraud, and boost trust between different social subjects (Ding & Zhong, 2021; Kostka, 2019; Zhang, 2020). SCSs are seen more as instruments regulating social behaviors and, especially, steering good behavior and curtailing inappropriate conduct by utilizing a combination of rewards and punishments (Kostka & Antoine, 2020; Raghunath, 2020). Municipal governments also employ local SCSs as a highly flexible tool to address new (pandemic-related) policy regulations and implement rewards and punishments that ensure

local businesses and individuals follow the rules (Drinhausen & Brussee, 2021). For instance, local government-run SCSs demonstrate their flexibility and adaptability by swiftly responding to the COVID-19 pandemic (Knight & Creemers, 2021).

A growing body of literature has started to address the issue of data privacy, fairness, and transparency with regard to the emerging SCSs. The SCSs' massive collection of personal information has foregrounded potential risks and raised concerns over violations of personal data and information security (Chen & Cheung, 2017; Ding & Zhong, 2021) and the misuse of data (Li, 2021).[2] Another commonly expressed concern regarding the application of SCSs is the unfairness and lack of transparency that the development and implementation of SCSs can often lead to in Chinese society. Raghunath (2020) writes that the SCS may widen and exacerbate social inequality as it tends to classify people into different social categories based on their credit scores. Existing research also highlights concerns about how the SCSs' scores are calculated, including the algorithms' lack of transparency and the potential for technical/algorithmic errors, which may generate an unfair credit score (Ding & Zhong, 2021; Kostka & Antoine, 2020; Li, 2021).

Overall, existing literature shows there is not a unified SCS in China. Instead, different cities and provinces devise their own SCS pilot projects to meet local requirements and demands. Despite some progress (e.g., in regulating businesses' and individuals' behaviors and socioeconomic activities), SCS implementation still faces multiple challenges and problems. A national unified SCS is lacking because of the fragmented rules and implementation of SCSs in different regions (Drinhausen & Brussee, 2021; Knight & Creemers, 2021). Tsai et al. (2021) suggest that the lack of clarity in the central government's top-level design of SCS (i.e., the Planning Outline [2014–2020]) is the main cause of the fragmentation because it confuses the local governments about the implementation of the central government's various requirements. Nonetheless, the inconsistency and fragmentation of SCSs have inevitably become a hurdle for cross-regional data sharing and integration.

Public understanding and engagement with SCSs

Several studies have examined the public's perception and understanding of various SCSs in China, and all of them have highlighted the Chinese public's high approval of and support for these projects (Kostka, 2019; Liu, 2022; Rieger et al., 2020). An online survey by Kostka (2019) argues that Chinese citizens—especially wealthier, better-educated, and urban residents—show high levels of approval for SCSs, with 80% of the survey respondents approving or strongly approving of SCSs. Liu (2022) corroborates the Chinese public's high support for SCSs and notes that it positively correlates with political trust (i.e., trust in the Chinese political system) and socioeconomic status (i.e., the higher the status, the more supportive they are). Rieger et al. (2020) attribute students' support for the SCS to Chinese culture's emphasis on collectivism and increasing public concerns over safety and trust issues across the country. Recent studies further demonstrate that China's strict censorship hinders the public from seeing the repressive and surveillance-oriented nature of SCSs and their potential risks, which explains the high public support (Xu et al., 2022).

While research has mainly focused on examining the general public's opinion of SCSs, several studies touch on Chinese citizens' engagement with local government-run SCSs. For example, by examining the implementation of the local SCS in city Z (an SCS model city), Tsai et al. (2021) suggest that city Z prioritizes the development of the SCS for businesses and makes the most progress in this regard. The SCS developed for ordinary citizens in city Z, however, is still in the "trial-and-error" stage of operations, and among its citizens there is limited awareness of and participation in the local SCS. Similarly, by

comparing the number of registered users of local SCSs (designed for individual citizens) in several pilot cities, Drinhausen and Brussee (2021) underscore citizens' limited participation in these local SCS projects. Local authorities' fear of making mistakes, as well as overreach and pushback, and the lack of previous experience are noted as primary reasons for their tentative and slow development of the individual-focused SCSs (Tsai et al., 2021).

This low engagement with local SCSs can partly be explained by ongoing concerns over the functioning of local scoring systems. For example, prior research highlights people's worries about the unclear nature of SCS regulations and about personal freedom potentially being constrained by the punishment rules, government surveillance, as well as the abuse of data by private companies (Liu, 2022; Rieger et al., 2020). Tsai et al. (2021) also suggest that little awareness of the local SCS, perceptions of the SCS having little impact on their everyday lives, and the unattractive benefits of SCS have led to people having limited engagement with city Z's SCS. While this anecdotal evidence points to weak engagement with local government-led SCSs, little is known about the factors causing the variations in citizens' participation in these SCS pilot projects. In the next section, we draw on the TAMs, UTAUT, DOI, technology rejection framework, privacy calculus, and privacy paradox theories to illuminate the factors affecting users' acceptance, rejection, adoption, or nonadoption of a particular technology or system.

THEORETICAL FRAMEWORK

The Technology Acceptance Models (TAMs) (Davis, 1989; Venkatesh & Davis, 2000), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and the Diffusion of Innovations (DOI) theory (Rogers, 1995) provide an integrated theoretical framework for this study to analyze which factors have an impact on Chinese citizens' acceptance, adoption, and usage of local SCSs. Moreover, the technology rejection framework proposed by Rama Murthy and Mani (2013) offers insights into examining the specific determinants impeding Chinese citizens' local SCS participation while contributing to their reluctance toward and/or nonparticipation in these digital scoring projects. Finally, the privacy calculus (Laufer & Wolfe, 1977) and privacy paradox theories (Brown, 2001; Norberg et al., 2007) offer theoretical guidance for this study to delve into the discrepancy or inconsistency between Chinese citizens' attitudes toward data privacy and safety and their actual participation in SCSs.

Technology acceptance and adoption

Originally developed by Davis (1989), the TAM theory argues that people's intention to accept and use a system or technology is affected by two key determinants: perceived usefulness and perceived ease of use. While perceived usefulness speaks to how people perceive that using a specific system would improve their job performance, perceived ease of use refers to whether (and the degree to which) people think that using a particular system is effortless (Davis, 1989). Based on the initial theoretical model, scholars have further developed and extended TAM to TAM 2, TAM 3, and UTAUT[3] by adding more constructs as determinants affecting people's usage intentions, such as social influence, facilitating conditions, voluntariness, and subjective norms (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh et al., 2003). The growing literature around TAMs and UTAUT also highlights the variance (or inconsistency) between users' acceptance or intention to use technology and their actual usage behavior (Davis, 1989; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). Although users are inclined to accept and adopt a specific

technology, they might not use it because of the multiple determinants mentioned above (e.g., perceived usefulness, perceived ease of use, social influence). Thus, the possibility of an acceptance–usage gap in users' adoption of technologies is underscored.

In addition, the DOI theory (Rogers, 1962) examines how new ideas, innovations, and technologies spread and are adopted. Specifically, Rogers (1995) argues there are five perceived attributes or constructs affecting users' adoption of an innovation, including the (perceived) relative advantage, compatibility, complexity, trialability, and observability.[4] DOI suggests that how users perceive these factors can affect (either positively or negatively) their adoption of an innovation (e.g., a system or technology). SCS can be viewed as a kind of innovation (i.e., a newly designed and implemented digital scoring system), developed and launched by the local government for social management and governance. In this regard, DOI provides a theoretical model for this study to examine the impact of the specific factors on Chinese citizens (not) adopting the local SCSs.

Finally, while many studies have examined user acceptance and adoption of a technology or system, little scholarly attention has been paid to the phenomenon and causes of technology rejection. Rama Murthy and Mani (2013) discern the five determinants of users' technology rejection, including technological complexity, technology fatigue, level of flexibility, altering user base, and switching cost and loss aversion.[5] This technology rejection analytical framework provides further guidance for this study to interrogate the specific factors contributing to Chinese citizens' rejection of and nonparticipation in local government-run SCSs.

Privacy calculus and privacy paradox

According to the privacy calculus theory, people often weigh potential benefits and risks before deciding to disclose private information (Laufer & Wolfe, 1977). Research further suggests that, despite privacy concerns, people tend to disclose their personal information if they think the benefits outweigh the risks (Acquisti & Grossklags, 2008; Krasnova et al., 2010). That is, they sacrifice privacy in exchange for benefits. The privacy calculus theory guides this study to examine how Chinese citizens perceive, calculate, and analyze the costs and benefits associated with their local SCS participation and then make the decision to join or not to engage with these digital scoring systems.

The privacy paradox theory offers insight into understanding the disparity between users' privacy attitudes and their actual behaviors in digital practices. Initially proposed by Brown (2001), the privacy paradox refers to a type of dichotomy between users' privacy attitudes and privacy behavior. That is, although users express their privacy concerns, they nonetheless take small actions to protect their personal information. Similar to privacy calculus, the privacy paradox theory also suggests that users tend to divulge their private information in exchange for relatively small benefits and rewards (Acquisti & Grossklags, 2005; Norberg et al., 2007). A strand of research has examined the privacy paradox phenomenon, particularly concentrating on individuals' practices using e-commerce and social networking platforms (Acquisti & Grossklags, 2005; Barnes, 2006; Young & Quan-Haase, 2013). Acquisti and Grossklags (2005) reveal the inconsistency between users' claimed privacy concerns and their actual behavior of disclosing personal information to get discounts and better services in the online shopping context. Barnes (2006) suggests that users tend to disclose their personal information on social networking platforms despite their privacy concerns because they view the benefits of information disclosure as more important than the potential risks.

When it comes to digital participation in local government-run SCSs, previous research suggests that the Chinese public expresses their concerns regarding data privacy and

safety (Rieger et al., 2020). However, little is known about how Chinese citizens respond to and handle these concerns. How do the citizens conduct the benefit–risk analysis regarding privacy disclosure and make the decision (not) to participate in their local SCSs? Is there consistency or disparity between Chinese citizens' claimed privacy concerns and their actual participation?

FINDINGS

Limited understanding and superficial participation in local government-run SCSs

Based on a document analysis of several cities' local SCSs,[6] we found that although some cities have launched and implemented their government-run SCSs targeting individual local residents, these local SCSs vary from each other but also demonstrate similarities in certain aspects. Different cities attach various names to their local SCSs, which are mostly associated with their unique local cultures and histories (e.g., Appendix A2 displays the names of the local SCSs in different cities). There is also great variation in terms of starting credit points/basic scores of different cities' local SCSs for individual users and the categories of the score and the represented level of credit (e.g., what score refers to which level/degree of credit).[7] Additionally, different cities also design and implement their own score management rules (e.g., how many scores can be added or deducted based on certain behaviors) for local SCS participants.

Despite the variances, however, we also identified the similarities in the specific benefits and incentives that different cities' local SCSs allow their participants with high scores to enjoy. For example, cities like Hangzhou, Xiamen, and Fuzhou stipulate that SCS users with good credit can receive discounts when taking public transportation, paying bills for living expenses, visiting local tourist spots, renting and applying for houses, and borrowing shared cars and shared bikes. They can also enjoy free access to some local public city services. Notably, our analysis reveals that, unlike the various rewards highlighted in the local SCS policies and guidelines, local governments normally do not foreground the punishment part of their local SCSs. For example, the rules of score deduction and punishments for maintaining scores below certain levels can be rarely found in different cities' SCS policy documents. Therefore, we argue that the different cities' local governments tend to make their local SCSs more benefit-oriented by utilizing various rewards to attract and incentivize residents in the local SCS design and implementation practices. To avoid discouraging local residents' from participating in their local SCS, the local governments even often intentionally downplay the punishments and consequences the SCS participants might face.

Interviewees' perception and understanding of government-led SCSs mostly revolve around the *Laolai*[8] blacklist published by China's Supreme Court and district courts and the punishments imposed on defaulters, including restrictions on high consumption (e.g., first- and business-class tickets on high-speed trains and airplanes). Many interviewees suggested that *Laolai* had recently become a buzzword in numerous news reports on television, newspapers, and social media and, therefore, immediately came to mind when the discussion turned to SCSs. However, while most interviewees (36 out of 44) came from the SCS model cities,[9] they had little awareness of the SCSs implemented by the local governments, except for the *Laolai* blacklists. Notably, it is not uncommon that many interviewees were confused about the SCSs led by different authorities and organizations; for example, they mixed up the concepts of local government-run SCSs, personal credit,[10] and commercial SCSs like Zhima Credit.

Despite having limited knowledge and a limited understanding of local government-run SCSs, the interviewees mostly expressed accepting and supportive attitudes toward these SCSs and their implementation around the country. For example, many interviewees highlighted the positive impacts they perceived the SCSs to generate for Chinese society, such as regulating business and individual behaviors, curbing immoral and illegal conduct, increasing trust-building in interpersonal relationships and economic activities, improving the social atmosphere (*shehui fengqi* 社会风气), maintaining social order, and providing benefits to and convenience in people's everyday lives. The interviewees' commonly expressed support for SCSs coheres with the findings from prior research that the Chinese public shows high levels of approval for and generally positive views of SCSs (Kostka, 2019; Liu, 2022).

It is worth noting that many interviewees did not object to the idea that the central or local governments may make participation in local SCSs mandatory in the future but instead regarded it as highly acceptable. As one interviewee (male, 23, Qingdao) noted, "I haven't joined [the local SCS] because no one asks me to do so. But if one day the government requires everyone to register for it, I wouldn't mind and would definitely register." Trust in the central and local governments (e.g., "I believe they must have a reason to make SCS participation mandatory") coupled with positive opinions about the SCSs (e.g., "It doesn't have any negatives and is for the common good of our society") played a key part in interviewees' acceptance of potentially mandatory participation in local SCSs.

Furthermore, our findings suggest that getting accustomed to the mandatory usage of multiple digital technologies, including Health Code[11] (the Chinese contact tracing app), travel record tracking apps/mini-programs, and facial recognition cameras in the COVID-19 pandemic context, also became a pivotal determinant of interviewees' acceptance of the mandatory SCS participation. As one interviewee (female, 29, Shenyang) noted, "I don't mind if the government makes it mandatory, as I think we've all been quite used to the fact that we're continuously required to take up various technologies like Health Code. For me, it's just one more app [the SCS app] to download." Several other interviewees concurred with this viewpoint, implying their previous experience of being required to use Health Code and travel record tracing apps/mini-programs significantly spurred their acceptance of the mandatory participation in SCSs, which might happen in the future. Interviewees' nonobjection attitude toward being required to adopt a certain type of digital technology like Health Code and SCS (particularly represented by the commonly expressed words "I don't mind") also implies that Chinese citizens have become increasingly accustomed to and tolerant of the government's compulsory implementation of digital surveillance technologies.

It is worth noting here that Health Code and SCS are two different digital technologies or systems developed by the Chinese government to monitor the different aspects of people's lives.[12] Our findings, however, indicate that the interviewees seemed to blur or neglect the distinction between these two technologies but tended to perceive them as similar digital tools used for social order and control. This blurred and mixed perception further suggests that some Chinese citizens, such as our interviewees, do not differentiate between the various types of digital technologies or view them separately. Therefore, their practices for being required to adopt one digital technology (e.g., Health Code) and getting accustomed to it might significantly increase or lead to their acceptance of another and even multiple forms of digital technologies.

At the time the interviews were conducted, five interviewees had already participated in the local government-led SCSs. However, superficial engagement and reluctant/forced participation were foregrounded as the main features of their local SCS participation. One interviewee (male, 30) from Hangzhou, for example, registered for the local SCS Qiangjiang Score[13] out of curiosity and interest: He had no idea what it was but was curious and wanted to try it. However, after using the Qianjiang Score WeChat mini-program for several months

and enjoying the discounts on renting houses, taking the subway, and riding sharing bicycles, he gradually lost interest in this digital scoring system. According to him, "After trying out some of its features, I'm not that interested as it's always the same functions and services out there, and no new features are being added." The interviewee's engagement with the local SCS WeChat mini-program Qianjiang Score indicates the gamification nature of digital participation in the SCS. Interviews with other SCS participants also suggest that many users might treat SCS more as a gaming system instead of viewing it as a social surveillance system. Initially driven by curiosity, the participants enter the system to explore and engage with the various functions and features in the SCS apps. However, after gaining some credit points and actual benefits, some participants may gradually lose interest in the "scoring game," especially after realizing there is nothing new or appealing to them, and, thus, choose to quit or become inactive SCS participants.

Our findings further highlight that other interviewees who participated in their local SCSs also tended to passively engage with these digital systems; for instance, they paid little attention to their credit scores and rarely used the SCS apps or WeChat mini-programs except for limited purposes. An interviewee (female, 26) from Fuzhou noted, "I have a Jasmine Score[14] in my e-Fuzhou app, but I seldom check it or use it for something as it's not that necessary to me and doesn't have much influence on my life." In this regard, the perceived limited functions of the SCS digital platforms and their little impact on everyday life led to interviewees' superficial and inactive engagement with local SCSs.

Although local SCS participation for individual citizens is largely voluntary in most districts, several cities request their citizens working in certain industries (e.g., government agencies) to participate in local SCSs. Rongcheng in Shandong province, for instance, has included all of its citizens over the age of 18 in its local SCS. All citizens would automatically get a basic Rongcheng Score[15] of 1000 once they follow the Xinyong Rongcheng WeChat public account or register on the Xinyong Rongcheng mobile app with their Chinese identity cards. Personal scores are increased or lowered based on the individuals' behavior. We interviewed two SCS participants (interviewee 1: female, 44; interviewee 2: male, 46) who work as civil servants in the local government agencies and participate in the Rongcheng Score as their workplaces require. Interviewee 1 explained, "It's mandatory for people like me who work in government institutions to join it [the Rongcheng Score]. Our workplace requires us to register, and we all have to maintain high scores as we need to use them for everything, like the annual evaluation of our job performance, job promotion, and job transfer to other (government) departments." Although both interviewees maintained high Rongcheng scores, they perceived this mandatory SCS participation as an "allocated task" and "burden" at odds with their personal desire. As interviewee 2 indicated, "If it was not a requirement, I definitely wouldn't use the score [the Rongcheng Score]. It's very time- and energy-consuming. To boost my score, I have to spend a lot of time taking part in activities that are actually boring and useless." In this regard, both interviewees' SCS practices were characterized by forced and reluctant participation. According to the TAM 3 (Venkatesh & Bala, 2008) and UTAUT (Venkatesh et al., 2003) theories, social influence is an important determinant affecting users' acceptance and adoption of a certain technology/system. In this regard, the two interviewees' workplaces' mandatory requirement to join the local SCS functions as social influence over (or social pressure on) their SCS participation.

As only a limited number of interviewees (5 out of 44) engaged with the local SCSs, nonparticipation in these digital scoring systems was the most common practice among our interviewees. Despite the commonly expressed acceptance of and support for SCSs, the interviewees noted multiple barriers to their actual engagement with the local SCSs, which will be explicitly discussed in the next section.

TABLE 1 Barriers to individual participation in local government-run SCSs ($n = 39$)[16]

Categories	Factors	Number of interviewees
Awareness	Little awareness of local SCSs	33
Efforts	Complicated registration process	36
	Time and energy needed to participate in score-increasing activities and manage credit scores	34
	Required digital literacy or skills for using SCS digital platforms	6
Concerns	Personal information privacy and safety	29
	Accuracy of the credit score rating system and calculation algorithm	17
	Fairness of the scoring system	7
	Unclear and ambiguous rules and regulations of credit score increase or deduction	22
	Fear of score deduction and subsequent consequences	28
	Potential use of SCSs to abuse power	6
Usefulness/benefits	Doubts about SCSs' effectiveness/usefulness	14
	Limited and/or unappealing benefits	31
	Diverse alternative digital services/platforms	9
Voluntariness	Nonmandatory participation in local SCSs	31

Abbreviation: SCS, social credit system.

Factors explaining nonengagement with local government-run SCSs

Based on our 44 semi-structured interviews, we summarize all the barriers to local SCS participation reported by our interviewees in Table 1. Specifically, in the interview process, we asked each interviewee who did not engage with the local government-run SCS to indicate and explain the reasons for nonparticipation and the specific factors they perceived as hindering their engagement. We classified these 14 barriers into five categories: awareness, perceived efforts, concerns, perceived usefulness/benefits, and voluntariness regarding local SCS participation.

Limited awareness of local SCSs was identified as the top barrier to interviewees' participation in these digital scoring projects. For example, "I've never heard about the local SCS" and "I don't know where to start and how to register" were common responses among the interviewees when asked about local SCSs. Although several interviewees noted that they had seen the news of local SCSs designed for businesses[17] (mostly the blacklists and redlists of local enterprises), they knew little about the local SCSs developed for ordinary individual citizens. Several interviewees also suggested that they had seen the *Laolai* blacklists being played on the screens in public transportation or at cinemas and that the local governments advertised their SCSs through public WeChat accounts. Nonetheless, these promotions mostly related to the SCSs targeting local businesses rather than individual citizens.

Our analysis of the local governments' SCSs in different cities revealed that the main reason for the interviewees having little awareness is that many local governments

developed and promoted their SCSs for individual citizens in a very limited scope. Specifically, most municipal governments have consistently prioritized the development of SCSs for businesses and government agencies while being more tentative and slower to establish local SCSs targeting individual citizens. In Table A2 in the appendix, we summarize the launch and development of local SCSs for individual citizens in 62 SCS model cities based on a review of the published policies, documents, and news articles regarding these model cities' SCS development. Our analysis shows that although the central government selected these cities as model cities for their SCS development, the title was granted more for their business SCS development. As illustrated in Table A2 in the appendix, each of the 62 model cities has implemented an SCS targeting businesses by 2022. However, only 30 cities of them have simultaneously established an individual-centric SCS (i.e., only approximately 48% of all model cities' SCSs target individuals). The other 32 model cities either have not launched SCSs or are still in the process of designing and developing their SCSs for individual citizens. The first group of SCS model cities is significantly further along in implementing individual SCSs than the second and third groups. Notably, as the first group of SCS model cities (National Development and Reform Commission, 2018), Hangzhou, Xiamen, Rongcheng, and Suzhou pioneered establishing SCSs targeting individual citizens and launching SCS digital platforms (e.g., SCS mobile apps, WeChat public accounts, and mini-programs). However, as demonstrated in Table A2, citizens' voluntary participation in these SCS pioneer cities remains at a relatively low level compared with the overall city population, except for Rongcheng, which automatically incorporates its citizens over the age of 18 into its SCS. By 2022, citizen participation rates were approximately 39% in Hangzhou, 23% in Xiamen, and 13% in Suzhou. Our finding that local SCSs for individuals are underdeveloped confirms the assertion by Tsai et al. (2021) that in many cities (even SCS model cities), SCSs designed for ordinary citizens are still at the preliminary developing stage, unlike the established business-centric SCSs.

The efforts perceived as high that an individual needs to make to join the local SCS also hinder interviewees' engagement. They include SCS digital platform registration, score management, and digital skill acquisition, all of which require time and energy and impede interviewees' willingness and motivation to participate in local SCSs. Particularly, interviewees highlighted the seemingly complicated registration process for SCS digital platforms and the significant amount of time they assumed they might need to spend to participate in score-added activities and boost their credit scores as significant barriers. As one interviewee (female, 30) from Zhengzhou, Henan province, noted, "I don't want to join the Shangding Score[18] because I may need to put a lot of effort into increasing my score. The whole process of registering and managing the score would also be very complicated and time-consuming." Additionally, a small number of relatively older interviewees (over the age of 50) with less experience using digital platforms and technologies mentioned that their limited digital skills and the difficulties they expected to encounter when using digital apps also hindered their participation in local SCSs. Both DOI (Rogers, 1995) and the technology rejection framework (Rama Murthy & Mani, 2013) suggest that the perceived complexity of using a technology/system negatively affects user acceptance and adoption of it and may lead to technology rejection. Our findings confirm these prior findings, further suggesting that the SCS registration and score management process, which are perceived as complicated, and the time and technical effort interviewees deem necessary for digital participation in SCSs markedly impeded their adoption of and engagement with the local SCSs.

Interviewees also expressed various concerns regarding the local SCSs' operational patterns, rules, and regulations, as well as the potential risks of their SCS participation. Among all of these factors, the interviewees frequently mentioned concerns regarding information privacy and safety (e.g., personal data being improperly protected, which may

cause data leakage, illegal trade, and data surveillance). Nevertheless, interviewees also suggested it is "unavoidable" that their personal data is collected and analyzed when they engage with various digital technologies and platforms. In terms of handling their individual information, they signaled greater trust in government authorities than in commercial organizations.

However, despite highlighting their privacy concerns, most interviewees took little to no action to protect their personal data; on the contrary, they either ignored or accepted the potential privacy risks that using digital platforms might entail. As one interviewee (female, 27, Shenzhen) indicated, "I know my information is continuously being collected and surveilled, but what can I do? I think actually most of us have no idea what we can do with the information surveillance stuff. For me, what I can do is just to accept and try to ignore it [the risk]." Our findings, in this regard, align with the privacy paradox mentioned in previous research (Acquisti & Grossklags, 2005; Brown, 2001; Norberg et al., 2007)—that is, the inconsistency or discrepancy between users' privacy attitudes and their actual behaviors of using these technologies and coping with their concerns. Additionally, the interviewees consistently highlighted that the increasing use of various digital apps has somewhat weakened their privacy awareness and concerns. The more digital platforms/technologies there are and the longer they have engaged with them, the less sensitive and less concerned they have become about the privacy issues and potential risks. This can be identified as another type of paradoxical digital practice and is characterized by the inconsistency between interviewees' increasing usage of digital technologies, changing privacy attitudes, and the actual behaviors of protecting their privacy and mitigating their various concerns.

Another primary concern identified by the interviewees refers to fears of credit scores being deducted and the consequences it may incur, such as putting them on blacklists and impeding their job applications or promotions. Notably, the interviewees' fear was somewhat triggered by their confusion regarding the operational systems of the local SCSs, such as the specific rules and guidelines for the score calculation, as well as the accuracy and fairness of the systems. Several interviewees, for instance, were confused about the local SCSs: "Why and how do [the government authorities] make those rules for increasing or deducting our scores? Are they fair? What is the algorithm behind the score? Who is responsible for managing our scores? What if the scoring systems malfunction or make a mistake?" Interviewees' commonly asked questions and concerns regarding the SCSs' operational mechanisms underscored the ambiguity and the lack of clarity and transparency of the local SCSs, which increased their fears and hindered their engagement with these systems.

The perceived usefulness or the potential benefits of local SCSs also affected interviewees' SCS participation. For example, some interviewees regarded the benefits and incentives they could get from participating in local SCSs as limited and/or unattractive. As one interviewee (female, 30, Zhengzhou) put it, "Most benefits are kind of very small rewards, like small discounts on taking the bus and subway, a free deposit for the bike-sharing system, and borrowing books from the library. None of them look appealing to me." Other interviewees also acknowledged that the benefits offered by local SCSs are not attractive to them and, in some cases, were simply irrelevant to their needs. For example, not everyone needs discounts or free deposits for bike-sharing services. The TAM and DOI theories both suggest that the perceived usefulness or relative advantage is a critical determinant of users' acceptance and adoption of a technology (Davis, 1989; Rogers, 1995; Venkatesh & Davis, 2000). If users cannot see the desired benefits or advantages of adopting a technology or system, they do not have a strong motivation to use it. Our findings corroborate these theories, further suggesting that the benefits, which were perceived as limited and unappealing, disincentivized the interviewees from participating in the local SCSs.

Furthermore, interviewees suggested that some benefits offered by local government-run SCSs can also be obtained from commercial SCSs such as Zhima Credit, Tencent Credit, and other digital platforms like the local mobile government apps. Thus, the local government-run SCSs are not indispensable or irreplaceable; rather, the multiple alternatives for citizens to get benefits to undermine local government-run SCSs' uniqueness and competitiveness in the burgeoning digital service market. Our findings further suggest that multiple alternative systems can be used for obtaining credit points and actual benefits, and the digital fatigue induced by engaging with similar digital systems and technologies (e.g., commercial SCSs, local mobile government apps) became a vital cause for interviewees' reluctant participation or nonparticipation in local government-run SCSs. This is in line with Rama Murthy and Mani's (2013) assertion that technology fatigue (especially caused by perceiving a technology as unnecessary and irreplaceable) is the main trigger for users' refusal to adopt a certain technology.

Nevertheless, we cannot assert that the benefits of participating in local SCSs are equally unimportant or unattractive to everyone. While some interviewees perceived SCSs' benefits as less appealing, we found other interviewees for whom the benefits enabled by SCSs play a key role in overruling their concerns and shaping their intention and desire to participate in local SCSs. For instance, although several interviewees had multiple concerns about SCS participation (e.g., efforts required, information privacy, score deduction, potential risks, and unclear guidelines), they still showed an interest in joining these digital scoring systems after learning about all the potential benefits, particularly those relating to their daily lives (e.g., discounts on taking public transportation and paying bills, free deposit/access to public services). This finding also confirms the privacy calculus theory (Laufer & Wolfe, 1977) as interviewees tended to give up their concerns (e.g., over data privacy and security) in exchange for certain benefits of SCSs after weighing the benefits and cost of participating in the local SCSs.

Finally, SCS participation remains largely voluntary for individual citizens in most cities at present, especially for those working in nongovernment agencies. However, voluntariness was reported as a major barrier to interviewees being motivated to join local SCSs. And while they had limited awareness of and participation in local government-led SCSs, the interviewees were actively engaged with commercial SCSs like Zhima Credit and Tencent Credit. Based on their long-term habit of using Alipay and WeChat, most interviewees had accumulated high credit scores on these platforms and used them for diverse benefits and kinds of convenience, such as getting discounts or free deposits when borrowing power banks and umbrellas, riding sharing bicycles, renting sharing cars, and booking hotels. Some interviewees expressed skepticism about whether the government-led SCSs would "win users' hearts" or "win in the competition" as they believed the commercial digital platforms always surpass those of the government in many respects (e.g., more diverse functions, engaging interface design, easiness to use, convenience, and benefits). Most interviewees suggested they would rather stick to the commercial SCSs due to the familiarity and long-term user habits they have developed. The contrast between interviewees' perceptions of and experiences with commercial and government SCSs also indicates that as users' reliance on and preference for commercial SCSs continue to grow, it might become more difficult for the government-led SCSs to gain traction and add users in the context of voluntary participation.

CONCLUSION

The Chinese central and local governments have consistently furthered SCS development nationwide by devising regional SCS development policies and plans, launching SCS pilot cities, and evaluating and awarding SCS model cities. Meanwhile, a growing body of

research has paid attention to the various SCSs and their impacts on Chinese society. Although prior research has uncovered the Chinese public's high support for SCSs (Kostka, 2019; Liu, 2022; Rieger et al., 2020), Chinese citizens' actual engagement with the SCSs, particularly with local government-run SCSs, has largely been neglected. By conducting 44 in-depth interviews between 2021 and 2022 to examine Chinese citizens' participation in local government-led SCSs, our research offers insights into these citizens' understanding of and practices regarding SCSs, as well as the multi-dimensional factors hindering their participation in local SCSs.

Our findings reveal that, despite high levels of acceptance for SCSs, most interviewees have not engaged with the local government-led SCSs. Even for the few interviewees who have joined a local SCS, their participation has mostly been inactive, superficial, reluctant (and even forced). Thus, a gap between individuals' acceptance and their actual adoption of local SCSs is highlighted, which provides further support for the existence of an acceptance–behavior gap as previously reported by TAM and UTAUT research (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh et al., 2003). We identified multiple factors hindering interviewees' participation in local SCSs, including their limited awareness of the local SCSs, the effort interviewees perceived they need to make to participate in local SCSs (e.g., time and digital skills), various concerns regarding SCS participation (e.g., information privacy, accuracy, fairness, and clarity of SCSs, as well as potential risks of joining SCSs), the perceived usefulness/benefits of local SCSs, and the voluntary participation in local SCSs. These diverse factors help to explain the gap between interviewee's acceptance and support for SCSs and the actual nonengagement with these digital scoring systems.

Although several cities (e.g., Hangzhou, Xiamen, and Rongcheng) are more advanced and progressive at implementing local SCSs for individual citizens, and more cities have embarked on developing their SCSs, the development of these individual-centric SCSs remains in the "exploration-and-test" phase and lag substantially behind the business-focused local SCSs. Our findings indicate that most interviewees perceived the SCS development in their cities as being in the preliminary and unmatured phase and requiring further development and promotion from the local governments. Additionally, we find that interviewees commonly expressed doubts about whether the local government-run SCSs could outperform the commercial SCSs, which have been popular and accumulated a large user base.

Interestingly, our findings imply that mandatory participation in local SCSs, which could be enforced by Chinese authorities in the future, was regarded as broadly acceptable. Our findings reveal that being required to engage with diverse digital technologies such as Health Code, travel record tracking apps/mini-programs, and facial recognition technologies have become a "new normal" in our interviewees' daily lives in the COVID-19 pandemic context. These digital technology participation experiences play an essential role in shaping interviewees' acceptance of and tolerance for mandatory SCS participation. The COVID-19 pandemic has offered the Chinese government a "window of opportunity" to further develop and implement a range of digital technologies across the country. Given the Chinese authorities' practices in getting citizens to participate in digital technologies, it is likely that the government would compel individuals to participate in the local government-led SCSs through coercive or mandatory elements to boost the SCS development and implementation nationwide and propel citizens' SCS engagement in the future.

Our research makes numerous contributions. First, it enriches the existing research on SCSs by adding more knowledge about the Chinese public's understanding of and participation in these digital scoring projects. Particularly, prior research generally includes various types of SCSs when examining public opinions of SCSs and does not make a distinction between people's attitudes toward different kinds of SCSs (e.g., the government-led SCSs targeting

business and individuals and commercial SCSs). Our research, in this regard, offers more detailed, specific, and in-depth insights into understanding Chinese citizens' perceptions of the local government-run individual-centric SCSs. Second, our research offers new perspectives to understand users' adoption and rejection of a specific technology or system, thereby enriching previous theories like TAMs (Davis, 1989; Venkatesh & Davis, 2000), UTAUT (Venkatesh et al., 2003), and DOI (Rogers, 1995) and illuminating the disparity between people's acceptance of and actual engagement with local SCSs. The multiple barriers that we identified as hindering Chinese citizens' local SCS participation also add new knowledge to the technology rejection framework (Rama Murthy & Mani, 2013), expanding the insights regarding what factors cause users' resistance to, nonadoption of, or reluctance to adopt a digital technology/system. Third, our study contributes to the research on public participation in government-led technologies or projects in authoritarian states like China by highlighting the barriers that hinder citizens' participation in these digital technologies. Finally, our findings help explain why the Chinese government can expand its surveillance capacity without much opposition from the public. Meanwhile, citizens' limited engagement with local SCSs also points to the constraints and predicaments faced by the Chinese government in implementing and facilitating the SCSs nationwide.

However, our research also has several limitations. The sample of the 44 interviewees is small and, therefore, not representative. Future research on this topic of citizen engagement in local SCSs could employ surveys and experimental research methods to obtain more representative samples. As shown, the local SCSs vary in terms of their focus on individuals versus businesses. Future research based on particular SCS model cities could add new insights if citizens' engagement rates were higher in the local government-led individual-centric SCSs. As the latest (third) group of 34 SCS model cities was selected in November 2021 and the focus of local SCSs is still evolving, future research might check whether and how local governments are addressing the barriers resulting in low SCS participation rate along the way.

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ORCID

Haili Li http://orcid.org/0000-0002-8487-7170
Genia Kostka http://orcid.org/0000-0002-3696-9513

ENDNOTES

[1] Zhima Credit (芝麻信用) is a commercial personal credit rating system launched by the Ant Group. Users can manage and check their Zhima credit score through the Chinese mobile app Alipay.

[2] The Personal Information Protection Law (PIPL), which came into effect in November 2021, is the Chinese government's first response to the absence of individual information protection regulations. It remains to be seen whether and how this new personal data protection law is enforced.

[3] TAM 2 proposes that new constructs such as subjective norms, voluntariness, image, job relevance, output quality, and result demonstrability influence users' perceived usefulness when it comes to adopting a new system or technology (Venkatesh & Davis, 2000). According to TAM 3, four different types of determinants have an impact on users' perceived usefulness and a technology's ease of use: individual differences, system characteristics, social influence, and facilitating conditions (Venkatesh & Bala, 2008). UTAUT proposes four key determinant factors that affect user intention and usage behavior: performance expectancy, effort expectancy, social influence, and facilitating conductions (Venkatesh et al., 2003).

[4] According to Rogers (1995), relative advantage refers to the advantage that the potential adopters perceive an innovation to have compared with existing technologies, systems, and products. Potential users are less likely to adopt an innovation if they cannot see the relative advantage. Compatibility denotes the degree to which an innovation fits the existing values and potential adopters' previous experiences and demands. An innovation perceived as compatible has a higher likelihood of being adopted. Complexity refers to how complex and difficult using an innovation is perceived to be. Potential adopters are more reluctant to adopt an innovation if they perceive it as hard to understand and use. Trialability is the degree to which an innovation can be tried and experimented with. Innovations that can be tried before being fully implemented are more easily adopted. Observability denotes the degree to which the results or outcomes of an innovation are visible and observable. Potential adopters are more likely to adopt an innovation if they can see it having more positive outcomes.

[5] Rama Murthy and Mani (2013) propose five determinants or causes of users' technology rejection. Technology complexity refers to notion that a technology perceived as complicated or hard to use can impede users' motivations for adoption and, thus, lead to them rejecting the technology. Technology fatigue includes feature fatigue (technological products get bloated with features), wait-and-watch tendency (users tend to wait if they cannot see the supremacy of a technology), unnecessary technology, and excessive choice effect (excessive choices among similar technological products might cause user rejection). Level of flexibility denotes that technologies lacking flexibilities at the fundamental level of operation might trigger rejection by the users. Altering the user base suggests that technologies failing to recognize the distinctions between different user categories and groups might result in technology rejection. Switching cost and loss aversion denotes that if users perceive it as costly and demanding to shift from one technology to another and that doing so may also engender some loss of existing benefits/incentives, they are likely to reject adopting the new technology.

[6] We examined the local government-run SCSs in several cities, including Hangzhou, Zhengzhou, Suzhou, Xiamen, Suqian, and Fuzhou. The SCS-related policies and documents include the 14th Five-Year Plan of the Social Credit System Construction and Development in different cities, local SCS websites and digital platforms (e.g., SCS mobile apps, SCS WeChat mini-programs and public accounts), the local social credit management guidelines and rules, and SCS-related news articles published by local governments.

[7] The type and starting credit score for SCS participants varies between cities. For example, Rongcheng's Rongcheng Score starts from 1000, while Xiamen's Egret Score starts at 500. The local governments in different cities also set up different credit score categories. For instance, the Qianjiang Score (Hangzhou's local SCS) sorts users into five different levels based on their personal credit scores. The maximum Qianjiang Score is 1000. Scores within different ranges are classified into different levels/degrees of credit. Specifically, >750: excellent credit, 700–750: great credit, 600–700: good credit, 550–600: general credit, <550: credit needs to be improved (Hangzhou.com.cn, 2018).

[8] The term Laolai (老赖) refers to debt defaulters, that is, people who default on court orders to repay their debt to banks or other people.

[9] The Chinese government has selected 62 cities and districts as so-called 'model cities' to develop local SCSs. Specifically, 12 cities were chosen as the first group of SCS model cities in January 2018 (National Development and Reform Commission, 2018). In the second group of SCS model cities in August 2019, 16 cities were chosen (Gov.cn, 2019). In the third group of SCS model cities in November 2021, 34 cities were selected (Credit China, 2021).

[10] The personal credit (个人征信) report is issued by the Credit Reference Center of the People's Bank of China and can be used to check individuals' credit information records for multiple purposes, such as applying for a loan or a job or buying/renting a house.

[11] Health Code (健康码) is the Chinese version of a contact tracing app. It is a multifunctional mini-program embedded in WeChat, Alipay, and some local government apps that can be used to trace and check individuals' health status, vaccination injection information, COVID-19 nucleic acid test result, movement record, and travel history.

[12] The Health Code mini-program (e.g., embedded within local mobile government apps and commercial apps like Alipay and WeChat) mainly focuses on recording and monitoring the information of people's COVID-19 tests and vaccination history, as well as travel history. The local SCS apps and mini-programs are designed to motivate people to participate in various social activities (e.g., waste sorting, water protection, charity/volunteer work) to maintain decent credit scores and records and, thus, obtain multiple benefits (e.g., discounts on renting houses, applying for loans, travel, and making appointments with local hospitals and free access to diverse city services). In this regard, we can see that unlike Health Code, the SCS focuses more on monitoring citizens' credit records and trustworthiness to regulate individual behaviors and steer what the government perceives as 'good' performance.

[13] The Qianjiang Score (钱江分) is the SCS launched by the Hangzhou government in November 2018. Hangzhou residents can voluntarily register for the Qiangjiang Score through multiple digital platforms, such as the Qiangjiang Score app, Qianjiang Score WeChat mini-programs, and WeChat public account.

[14] The Jasmine Score (茉莉分) was launched by Fuzhou government in 2018. Fuzhou residents can register and check their Jasmine scores through the local mobile government app called e-Fuzhou.

[15] The Rongcheng Score (荣诚分) was launched by the Rongcheng provincial government, Shandong province, in 2013.

[17] The local governments in different cities and provinces have developed various SCSs to rate local enterprises' behavior and credit.

[18] The municipal government in Zhengzhou city, Henan province, launched its local SCS Shangding Score (商鼎分) in 2019.

[16] Among the 44 interviewees who participated in our interviews in 2021–2022, 39 interviewees did not engage with the local SCSs.

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APPENDIX

TABLE A1 Interviewees' demographic information ($n = 44$)

Items	Number	Percent (%)
Age		
10–19	1	2
20–29	28	64
30–39	7	16
40–49	4	9
50–59	4	9
Gender		
Male	27	61
Female	17	39
Districts		
East	37	84
Central	6	14
West	1	2
Education		
High school	7	16
Bachelor's degree	18	41
Master's degree	19	43

TABLE A2 The development of local SCSs for individual citizens in 62 SCS model cities

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
Qianjiang Score 钱江分	Qianjiangfen (钱江分) app; WeChat public account; WeChat mini-program	Hangzhou 杭州	Zhejiang 浙江	First group (2018)	Open to all local residents; voluntary participation	Launched in November 2018; Participation rate: 38% (4.6 million registered users of Qianjiang Score out of the city population of 11.9 million[a])	Qianjiang Score official website: http://qianjiangfen.cn/
Unnamed	/	Nanjing 南京	Jiangsu 江苏	First group (2018)	Open to all local residents; voluntary participation; specifically focused groups: civil servants, corporate managers, lawyers, teachers, real estate agents, and people working in the industries of accounting, auditing, tax, statistics, finance, medicine, academia, media and journalism, and tourism	/	The 14th Five-Year Plan of the Construction of Social Credit System in Nanjing: https://www.creditchina.gov.cn/zhuanxiangzhili/zhuanxaingzhilixinzheng/202110/t20211022_247042.html

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
Egret Score 白鹭分	Bailufen (白鹭分) app BailufenWeChat public account	Xiamen 厦门	Fujian 福建	First group (2018)	Open to all local residents; voluntary participation	Launched in July 2018; Participation rate: 23% (1.18 million registered users of Egret Score out of the city population of 5.16 million[a])	https://www.creditchina.gov.cn/xinyongdongtai/difangxinyongdongtai/202101/t20210105_222741.html
/	/	Chengdu 成都	Sichuan 四川	First group (2018)	/	/	
Osmanthu Score 桂花分	Zhihui Suzhou (智慧苏州) app Chengxin Suzhou (诚信苏州) WeChat public account	Suzhou 苏州	Jiangsu 江苏	First group (2018)	Open to all local residents; voluntary participation	Launched in 2018; Participation rate: 13% (1.63 million registered users of Osmanthu Score out of the city population of 12.75 million[a])	https://baijiahao.baidu.com/s?id=1606013999839208017&wfr=spider&for=pc
Xichu Score 西楚分	Xinyong Suqian (信用宿迁) WeChat Public account	Suqian 宿迁	Jiangsu 江苏	First group (2018)	Open to all local residents; voluntary participation	Launched in 2018	http://www.jiangsu.gov.cn/art/2018/3/26/art_33718_7545771.html
/	/	Huizhou 惠州	Guangdong 广东	First group (2018)	/	/	

(Continues)

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
Oujiang Score 瓯江分	Xinyong Wenzhou (信用温州) WeChat public account	Wenzhou 温州	Zhejiang 浙江	First group (2018)	Open to all local residents; voluntary participation	Launched in 2019; Participation rate: 11% (1.1 million registered users of Oujiang Score out of the city population of 9.57 million[a])	http://www.wenzhou.gov.cn/art/2019/10/21/art_1217832_39047101.html https://baijiahao.baidu.com/s?id=1707608834269207232&wfr=spider&for=pc
Seashell Score 海贝分	Xinyong Wehai (信用威海) app Weihai Shiminka (威海市民卡) app	Weihai 威海	Shandong 山东	First group (2018)	Open to all local residents; voluntary participation	Launched in 2018	https://www.creditchina.gov.cn/gerenxinyong/gerenxinyongliebiao/201811/t20181114_131214.html
/	/	Weifang 潍坊	Shandong 山东	First group (2018)	/	/	
Not being named	Zheliban (浙里办) app Xinyong Yiwu (信用义乌) WeChat public account	Yiwu 义乌	Zhejiang 浙江	First group (2018)	Open to all local residents; voluntary participation	Launched in 2017	http://www.cankaoxiaoxi.com/china/20170814/2220247.shtml https://www.sohu.com/a/287889784_100020538
Rongcheng Score 荣诚分	Xinyong Rongcheng (信用荣成) WeChat public account	Rongcheng 荣成	Shandong 山东	First group (2018)	Open to all local residents; compulsory participation for people working in certain industries, such as civil	Citizens aged over 18 are automatically enrolled in Rongcheng Score	https://rccredit.cn/searching/personal_xyjf_page.html

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
					servants, teachers, and doctors		
/	/	Qingdao 青岛	Shandong 山东	Second group (2019)	/	/	
Yellow Crane Score 黄鹤分	/	Wuhan 武汉	Hubei 湖北	Second group (2019)	/	/	
/	/	Anshan 鞍山	Liaoning 辽宁	Second group (2019)	/	/	
/	/	Pudong New District 浦东新区	Shanghai 上海	Second group (2019)	/	/	
/	/	Jiading District 嘉定区	Shanghai 上海	Second group (2019)	/	/	
Afu Score 阿福分	Lingxi (灵锡) app	Wuxi 无锡	Jiangsu 江苏	Second group (2019)	Open to all local residents; voluntary participation	Launched in 2021	https://baijiahao.baidu.com/s?id=1710138676137080805&wfr=spider&for=pc
/	/	Hefei 合肥	Anhui 安徽	Second group (2019)	/	/	

(Continues)

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
/	/	Huaibei 淮北	Anhui 安徽	Second group (2019)	/	/	
Lehui Score 乐惠分	/	Wuhu 芜湖	Anhui 安徽	Second group (2019)	/	Launched in 2018	http://credit.wuhu.gov.cn/whweb/points/
Not being named	Wanshitong (皖事通) app	Anqing 安庆	Anhui 安徽	Second group (2019)	Open to all local residents; voluntary participation	Launched in 2020	https://www.sohu.com/a/430321635_100252839
Jasmine Score 茉莉分	e-Fuzhou app	Fuzhou 福州	Fujian 福建	Second group (2019)	Open to all local residents; voluntary participation	Launched in 2018	https://baijiahao.baidu.com/s?id=1674982833979346105&wfr=spider&for=pc
/	/	Putian 莆田	Fujian 福建	Second group (2019)	/	/	
Shangding Score 商鼎分	Zhenghaoban (郑好办) app iZhengzhou app	Zhengzhou 郑州	Henan H 河南	Second group (2019)	Open to all local residents; voluntary participation	Launched in 2019	https://baijiahao.baidu.com/s?id=1641203348894320278&wfr=spider&for=pc
Three Gorges Score 三峡分	/	Yichang 宜昌	Hubei 湖北	Second group (2019)	/	No information regarding the implementation of the Three Gorges Score has been found	https://www.sohu.com/a/274183021_100186208

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
Xiangcheng Quandu Personal Credit Score 香城泉都个人信用分	/	Xianning 咸宁	Hubei 湖北	Second group (2019)	/	/	http://szb.xnnews.com.cn/xnrb/html/2019-08/24/content_340929.htm
/	/	Luzhou 泸州	Sichuan 四川	Second group (2019)	/	/	
Haihe Score 海河分	/	Binhai New District 滨海新区	Tianjin 天津	Third group (2021)	/	No information regarding the implementation of the Haihe Score has been found	https://baijiahao.baidu.com/s?id=1620833337532473090&wfr=spider&for=pc
Not being named	Chengxin Niucheng (诚信牛城) WeChat mini-program	Xingtai 邢台	Hebei 河北	Third group (2021)	Open to all local residents; voluntary participation	SCS WeChat mini-program launched in 2021	http://xy.xingtai.gov.cn/xydt/xtdt/202104/t20210415_3384820.html
/	/	Dalian 大连	Liaoning 辽宁	Third group (2021)	/	/	
/	/	Yingkou 营口	Liaoning 辽宁	Third group (2021)	/	/	

(Continues)

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
Hero Score 英雄分	/	Siping 四平	Jilin 吉林	Third group (2021)	/	/	http://credit.siping.gov.cn/contents/678/146028.html
/	/	Xuhui District 徐汇区	Shanghai 上海	Third group (2021)	/	/	
/	/	Putuo District 普陀区	Shanghai 上海	Third group (2021)	/	/	
/	/	Changzhou 常州	Jiangsu 江苏	Third group (2021)	/	/	
/	/	Huaian 淮安	Jiangsu 江苏	Third group (2021)	/	Being developed (according to news report in 2019)	https://www.creditchina.gov.cn/gerenxinyong/gerenxinyongliebiao/201908/t20190814_165407.html
/	/	Yangzhou 扬州	Jiangsu 江苏	Third group (2021)	/	/	
/	/	Kunshan 昆山	Jiangsu 江苏	Third group (2021)	/	/	
Tianyi Score 天一分	Yongpai (甬派) app	Ningbo 宁波	Zhejiang 浙江	Third group (2021)	Open to all local residents; voluntary participation	Launched in 2019	https://baijiahao.baidu.com/s?id=1702143899388534322&wfr=spider&for=pc

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
							https://page.om.qq.com/page/OlOgk8k-Wr6ySMN6jJqQ9r_Zw0
Not being named	Xinyong Huzhou (信用湖州) WeChat public account	Huzhou 湖州	Zhejiang 浙江	Third group (2021)	Open to all local residents; voluntary participation	Launched in May 2020	https://baijiahao.baidu.com/s?id=1667985753386486873&wfr=spider&for=pc
/	/	Jinhua 金华	Zhejiang 浙江	Third group (2021)	/	/	
Xinan Score 信安分	XinyongQuzhou (信用衢州) WeChat public account Zheliban (浙里办) app	Quzhou 衢州	Zhejiang 浙江	Third group (2021)	Open to all local residents; voluntary participation	Launched in August 2019	https://www.sohu.com/a/332164435_99977225
Zizai Score 自在分	Xinyong Zhoushan (信用舟山) WeChat public account	Zhoushan 舟山	Zhejiang 浙江	Third group (2021)	Open to all local residents; voluntary participation	Launched in December 2020	https://baijiahao.baidu.com/s?id=1685214357181596579&wfr=spider&for=pc
Hehe Score 和合分	XinyongTaizhou (信用台州) WeChat public account	Taizhou 台州	Zhejiang 浙江	Third group (2021)	Open to all local residents; voluntary participation; specifically focused groups: legal representatives of	Launched in February 2021	http://www.zjtz.gov.cn/art/2021/12/3/art_1229550293_3758967.html http://www.zjtt.gov.cn/art/2021/2/10/art_

(Continues)

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
					the enterprises, lawyers, and accountants		1229296087_3689873.html
Lvgu Score 绿谷分	Zheliban (浙里办) app	Lishui 丽水	Zhejiang 浙江	Third group (2021)	Open to all local residents; voluntary participation	Launched in April 2020; Participation rate: 6% (0.15 million registered users of Lvgu Score out of the city population of 2.5 million[a])	https://baijiahao.baidu.com/s?id=1669708426680168735&wfr=spider&for=pc http://k.sina.com.cn/article_7517400647_1c0126e47059031kp8.html
Quancheng Score 泉诚分	Xinyong Jinan (信用济南) WeChat public account	Jinan 济南	Shandong 山东	Third group (2021)	Open to all local residents; voluntary participation	Launched in 2020	https://baijiahao.baidu.com/s?id=1672659644299967833&wfr=spider&for=pc
Lighthouse Score 灯塔分	/	Yantai 烟台	Shandong 山东	Third group (2021)	/	Being developed but not yet implemented	http://ytsk.jiaodong.net/system/2021/02/26/014149257.shtml
/	/	Jining 济宁	Shandong 山东	Third group (2021)	/	/	
Mingde Score 明德分	/	Dezhou 德州	Shandong 山东	Third group (2021)	/	No information regarding the implementation of the Mingde Score has been found	https://baijiahao.baidu.com/s?id=1693751422326857781&wfr=spider&for=pc

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
Not being named	/	Xintai 新泰	Shandong 山东	Third group (2021)	Open to all local residents; voluntary participation	Launched in January 2019	https://www.sohu.com/a/332676711_99960255
Shali Score 沙澧分	Xinyong Luohe (信用漯河) WeChatppublic account Xinyong Luohe app	Luohe 漯河	Henan 河南	Third group (2021)	Open to all local residents; voluntary participation	Launched in 2019	https://www.henandaily.cn/content/2019/0814/181998.html
/	/	Nanyang 南阳	Henan 河南	Third group (2021)	/	/	
/	/	Jingmen 荆门	Hubei 湖北	Third group (2021)	/	/	
/	/	Guangzhou 广州	Guangdong 广东	Third group (2021)	/	/	
/	/	Shenzhen 深圳	Guangdong 广东	Third group (2021)	/	/	
/	/	Foshan 佛山	Guangdong 广东	Third group (2021)	/	/	

(Continues)

TABLE A2 (Continued)

Name of SCSs	SCS digital services/platforms (for citizen registration and participation)	City	Province	Group of SCS model cities	Target groups	Description of SCSs targeting individual citizens (e.g., launch time, registered users)	Information source
/	/	Banan District 巴南区	Chongqing 重庆	Third group (2021)	/	/	
/	/	Jiangjin District 江津区	Chongqing 重庆	Third group (2021)	/	/	
/	/	Tongliang District 铜梁区	Chongqing 重庆	Third group (2021)	/	/	
/	/	Baoshan 保山	Yunnan 云南	Third group (2021)	/	/	
/	/	Yanan 延安	Shanxi 陕西	Third group (2021)	/	/	

Note: Out of the 62 SCS model cities, 30 have established and implemented the individual-focused SCSs, accounting for 44%. Specifically, nine out of 12 cities from the first group of SCS model cities, 8 out of 16 cities from the second group, and 13 out of 34 cities in the third group of SCS have developed and implemented SCSs for individual citizens of SCS model cities. '/' denotes information related to local SCSs cannot be found. For example, some local authorities have not attached specific names to their SCSs, launched any SCS digital services, or published any information regarding their SCSs' registered users. Statistics included in this table were collected by March 2022. Given the evolving nature of the local SCSs' development and implementation in different cities and districts, some data needs to be updated continually.

[a]The information on city populations is from the data of the Seventh National Population Census published by each municipal government on their official government website in 2021.