



Article

China's social credit systems and public opinion: Explaining high levels of approval

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Genia Kostka

Freie Universität Berlin, Germany

Abstract

A variety of commercial and local government social credit systems (SCSs) are now being implemented in China in order to steer the behavior of Chinese individuals, businesses, social organizations, and government agencies. Previous research finds that these SCSs are employed by the Chinese state as “surveillance infrastructure” and for social management. This article focuses on a different angle: the public’s opinion of SCSs. Based on a cross-regional survey, the study finds a surprisingly high degree of approval of SCSs across respondent groups. Interestingly, more socially advantaged citizens (wealthier, better-educated, and urban residents) show the strongest approval of SCSs, along with older people. While one might expect such knowledgeable citizens to be most concerned about the privacy implications of SCS, they instead appear to embrace SCSs because they interpret it through frames of benefit-generation and promoting honest dealings in society and the economy instead of privacy-violation.

Keywords

China, public opinion, rating systems, reputational systems, social credit system, social management

Introduction

In recent years, China has made rapid advances in the incorporation of big data technologies in governance processes. For example, the country has started utilizing big data to improve environmental governance, including setting up intelligent environmental warning and monitoring systems, as well as national pollution big data platforms (Kostka

Corresponding author:

Genia Kostka, Institute of Chinese Studies, Freie Universität Berlin, Fabeckstr. 23-25, 14195 Berlin, Germany.

Email: g.kostka@fu-berlin.de

and Zhang, 2018). In addition to using big data for more efficient policy making and enforcement, cutting-edge technologies are intended to be used for social control and social management (社会管理 *shehui guanli*) in order to address societal problems and pre-empt social instabilities. The emerging social credit system (社会信用体系 *shehui xinyong tixi*, hereafter simply referred to as SCS) stands out as an initiative with the potential to radically transform the state's governance of both society and the economy. Under this system, individuals, businesses, social organizations, and government agencies are assessed based on their "trustworthiness." As has been pointed out by previous commentators, this is not a single unified system (yet) since it includes different fragmented initiatives managed by both local governments and commercial companies (Ahmed, 2017b; Creemers, 2018). What the different SCS initiatives have in common is that, by setting up systems of benefits and sanctions, they aim to steer the behavior of individuals, businesses, and other organizations in China. Yet, the government and commercial SCS pilots differ markedly in terms of goals and methods. Government-led SCS pilots are mandatory (i.e. aiming to include all local citizens, social organizations, government agencies, and businesses in key industries), and by publishing redlists and blacklists (i.e. public lists with rewards or punishments doled out for especially "trustworthy" or "untrustworthy" conduct) they aim to improve law enforcement and regulatory practices and are used as a mechanism of social management (Hoffman, 2017). Commercial SCS pilots, by contrast, are voluntary such that citizens can select to opt-in and function more like "loyalty schemes" (Creemers, 2018: 22) whereby private technology firms seek to assess customers' financial creditworthiness and promote the use of commercial platforms and consumption. While commercial pilots are technologically advanced and assessments complex, the level of technology of most government-led pilots remains low with punishment systems often being binary as "one is either on or off the blacklist" (Creemers, 2018: 27).

Although different SCSs have been widely discussed in the media, and academic research in this field is advancing rapidly, there is still little known about how Chinese citizens actually perceive these SCS initiatives. As a first step, this study gauges citizens' approval of SCSs in China and identifies the factors that shape variation in views. The analysis is based on an online survey conducted between February and April 2018 with 2209 respondents across China and weighted by age, gender, and region. The survey is representative of the Internet-connected population in China aged 14–65 based on age and gender (with the exception of gender representativeness in the oldest age group) and region (Central, West, and East). In addition, 17 semi-structured interviews were conducted with Chinese citizens during March and August 2018 in Beijing and Shanghai. Interviews helped to better understand the observed high degree of approval uncovered in our analysis. The objectives of this article are twofold: (1) to document the overall level of citizens' (non-)approval of different SCSs and (2) to identify the underlying factors that drive variations in approval of SCSs.

The article contributes to existing research in numerous ways. Previous research has focused mainly on SCSs as part of the Chinese Communist Party's (CCP) broader strategy of social management and control (Hoffman, 2017) and provided insight into the system's legal framework (Creemers, 2018; Daum, 2017, 2018). Recent studies have also analyzed the complex relationship between private technology firms and the Chinese state (Jiang

and Fu, 2018; Lv and Luo, 2018) and examined local experiments and pilots (Ohlberg et al., 2017). The pilot in the city of Rongcheng in Shandong province has attracted particular attention (Knight, 2018; Mistreanu, 2018). A growing number of studies have also turned to investigation of public opinion toward SCSs in China, looking at citizens' attitudes and privacy concerns (Ahmed, 2017a; Ohlberg et al., 2017). The findings so far are based on very limited data (i.e. a dozen interviews with Sesame Credit users or media analyses), which makes it difficult to generate broader claims about the public opinion of SCSs. The unique survey dataset exploited here sheds new light on variation in SCSs approval among different citizen groups in China. The analysis studies the effects of factors potentially influencing citizens' opinions of SCSs, including the role of citizens' socio-demographic background and beliefs, particular characteristics of SCSs and citizens' perceptions of SCS with regards to received (dis)advantages and functions.

Literature review

National plans and local government SCS pilots

At the national level, numerous ambitious plans outline concrete steps toward creating a nationwide SCS, including the creation of data-sharing platforms required for a unified SCS. The planned national SCS will assess citizens, businesses, and other organizations in China with regard to their creditworthiness, adherence to law, and compliance with the government's ideological framework. The concept for a SCS emerged as early as 1991 as a strategy of "addressing problems in commercial and financial sectors" (Liang et al., 2018). In 2007, the State Council issued the *Guiding Opinions Concerning the Construction of a Social Credit System* (State Council, 2007), resulting in 18 central government departments initiating a SCS (Liang et al., 2018). In the years that followed, a handful of local governments designed local SCS pilots, but the national SCS plan only received particular attention in 2014 when the State Council published the *Planning Outline for the Construction of an SCS*. The *Planning Outline* maps a specific SCS implementation strategy, stating that a framework for implementing a SCS should be in place by 2020 (State Council, 2014).¹

Following the release of the 2014 Planning Outline, many local governments responded by devising SCS pilots in their localities. By July 2018, more than 40 municipal and provincial governments had established a local SCS pilot (Credit China, 2018).² These pilots share an emphasis on inducing moral and law-abiding behavior by incentivizing citizens, businesses, social organizations, and government agencies to adhere to the law and regulations in selected key enforcement areas such as food safety and environmental protection. Governments publish blacklists for individuals and organizations with especially "untrustworthy" or illegal behavior, resulting in sanctions such as limited access to high-speed trains and financial services. For individuals and organizations with a record of especially "trustworthy" behavior, redlists are published, resulting in tax reductions and easier access to governmental services (Xinhua, 2016). Under the SCS pilots, local governments increasingly publish "interdepartmental agreements on joint enforcement of rewards and punishments for 'trustworthy' and 'untrustworthy' conduct" (China Law Translate, 2018). In December 2017, the National Development and Reform

Commission (NDRC) and the People's Bank of China (PBoC) also selected "model cities," among them Rongcheng, Weihai, Suqian, Hangzhou, Wenzhou, and Xiamen (NDRC, 2018; Wenzhou Government, 2018). These cities were selected as "model cities" since they have taken steps toward a far-reaching implementation of their local SCS, including the establishment of redlists and blacklists in key areas, creating a credit information sharing platform, and making data-sharing efforts with other national or provincial SCS platforms.

Researchers concur that beyond promoting law-abiding and ethical conduct in Chinese society and economy, the Chinese state also understands SCS as a powerful tool of authoritarian resilience (Hoffman, 2017; Jiang and Fu, 2018; Liang et al., 2018). Hoffman (2017) convincingly argues that the SCS is a component of the CCP's broader plan to automate its social management strategy by utilizing new technologies in order to govern via "feedback loop, a cycle of shaping, managing and responding" (p. 2). Such mechanisms of positive and negative reinforcement are intended to create a citizenry that continually engages in automatic self-monitoring and adjustment of its behavior in a manner reminiscent of Foucauldian governmentality;³ if successful in this effort, the Communist Party will possess a powerful means of quelling dissent, one that is comparatively low-cost and which does not require the overt (and unpopular) use of coercion by the state.

Commercial SCS pilots

Currently, the more widely used SCSs are those operated by commercial companies. In 2015, the PBoC gave permission to eight private companies to develop social credit pilots (PBoC, 2015). The most common commercial SCSs are Sesame Credit (芝麻信用 *Zhima Xinyong*), developed by Ant Financial Services Group, an affiliate of Alibaba, and Tencent Credit (腾讯信用 *Tengxun Xinyong*), developed by Tencent Holdings. Commercial SCSs are offered on a voluntary basis as users can opt-in. As the system evolves, the functions of commercial SCSs are continuously expanded. As of the time of writing in 2018, commercial SCSs offer users a wide range of benefits including qualification for personal credit loans, easier access to sharing economy services (e.g., renting of bikes or cars), fast-tracked visa applications, preferential treatment at hospitals, and free health check-ups. While many of these services target the younger generation of digital natives using mobile payment services for daily transactions, interviews in Beijing revealed that attractive banking services in particular also incentivized older citizens to join (Interview 2, March 2018). Sesame Credit scores are updated once a month and calculated and weighted based on five criteria: credit history, user behavior (e.g. purchasing behavior, donating to charity), ability to pay off debts and stable personal assets, personal information (e.g., provided reliable personal information), and social network (e.g. quality of social network). The algorithms used to create individual scores remain unknown (Ahmed, 2017b), which makes it impossible for users to analyze and understand the creation of their scores.

The relationship between regulators (PBoC and NDRC) and technology companies such as Alibaba and Tencent has been tense. In 2017, Beijing refused to transform the initial temporary permissions granted to eight private companies into official licenses. This denial was driven by concerns over the firms' ability to assign comprehensive and independent credit scores and underlying conflicts of interest (Reuters, 2017). In 2018,

the PBoC issued the only official license for a “personal credit service,” valid for only 3 years, to Baihang Credit. Baihang Credit is jointly owned by the National Internet Finance Association of China (NIFA) (36%) and the eight commercial credit service companies (each 8%), including Sesame Credit and Tencent Credit (PBoC, 2018). This new license implies that one single “Credit Union” (信联 *Xinlian*) will be established as a means to accelerate the implementation of a unified national SCS. It also allows PBoC to remain in control of the companies and their SCSs as NIFA is under the administrative leadership of PBoC (Creemers, 2018).

Public approval of SCSs

Despite the newness of these initiatives, many pilots have already achieved a wide coverage and been thoroughly woven into the fabric of Chinese citizens’ everyday life. Yet, scholarly research has struggled to keep pace with these rapid changes and there remains a dearth of analysis of how SCSs are actually perceived by citizens.⁴ The small number of existing studies of Chinese citizens’ views of the importance of privacy and the SCSs point to the salience of individual characteristics and beliefs, particular characteristics of SCSs and various perceived functions of SCSs potentially influencing citizens’ in shaping attitudes. A first group of studies points to the importance of socio-demographic factors in explaining variation in public opinion. First, Chinese citizens’ attitudes toward privacy protection are shaped by age as

respondents between 30 and 50 years old are the most suspicious of the data collected by enterprises which involve economic activities [...] people of this age group have accumulated a certain amount of savings and thus pay much attention to privacy protection. (Wang and Yu, 2015: 786)

The same study shows that more highly educated respondents also care more about data privacy protection (Wang and Yu, 2015). Given these findings, one would expect that the older and more highly educated respondents to be more skeptical of SCSs. Similarly, analysis of a recent large-scale online survey of public preference by Pan and Xu (2018) finds that the younger, wealthier, and better-educated urban elites in provinces with higher levels of development have stronger preferences for democratic institutions and liberal views. Accordingly, one might expect that the correlates of liberal views in China would also predict more skeptical appraisals of SCSs.

Another strand of the literature suggests that Chinese citizens are developing differentiated judgments of SCSs based on who runs them and how they operate. Wang and Yu (2015) find that what kind of agency is handling personal data matters to citizens, as they show higher trust in central or local governments than in businesses. This finding is mirrored in Ohlberg et al.’s study of consumer views of government and commercial SCSs which shows that criticism in the media debate revolves around commercial companies accessing too much personal data, while no similar accusations are made against the government (Ohlberg et al., 2017). Ahmed’s (2017a, 2018) insightful research on Sesame Credit users’ preferences shows how the rising number of third-party apps integrated into Sesame Credit has led Chinese citizens to question transparency and

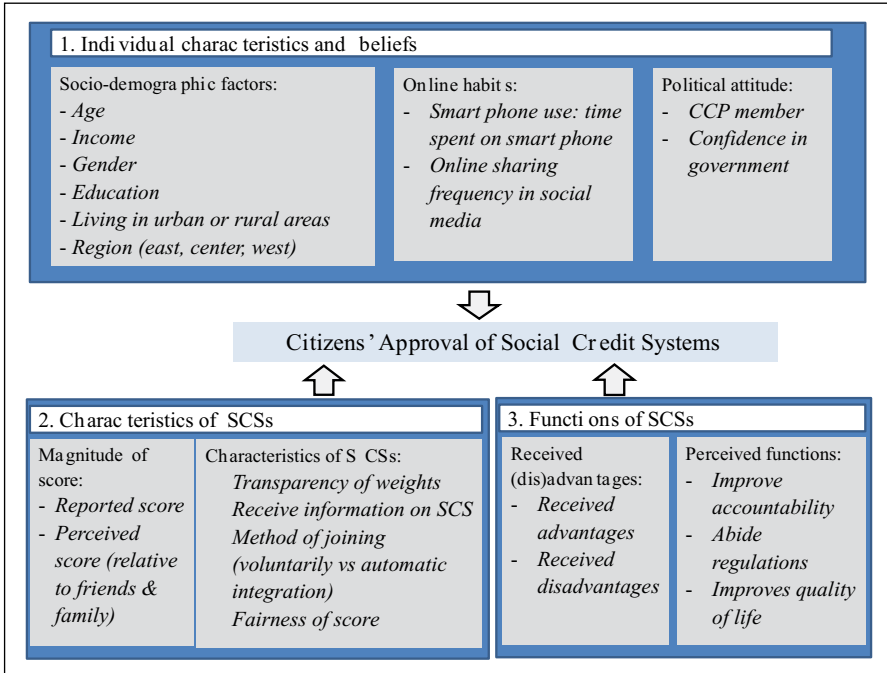


Figure 1. SCS conceptual framework.

existing data-sharing practices (Ahmed, 2018). Ahmed (2017a) studies citizens' response strategies and finds that some Sesame Credit users avoid mixing online and offline information, for instance, by not adding their friends to Alipay.

Figure 1 summarizes a conceptual framework to understand variation in SCS approval levels among Chinese citizens. Potential factors influencing citizens' disposition toward SCSs are grouped in three categories. The first category of individual characteristics and beliefs includes socio-demographic factors, online habits, and political attitude and beliefs. The second category refers to particular characteristics of SCSs, such as magnitude of score (reported score as well as perceived magnitude of score in relation to friends and family), perceived transparency of the calculation of scores, received information about SCSs, and method of joining a SCS (voluntarily vs automatic). The third category includes information on received (dis)advantages and perceived different functions of SCS (i.e. improving accountability, abiding regulations, and improving quality of life).

Methodology

Primary data sources and questionnaire design

We conducted a nationwide online survey between February and April 2018, in cooperation with a Berlin-based survey company. The survey company collaborates with Chinese companies that operate websites and apps. The survey was conducted online through

desktops and mobile applications. The participants came from a river panel user base of more than 350,000 Chinese users⁵ that use a variety of more than 40,000 different apps and mobile websites. These apps and mobile websites include different types of games, apps, and websites, such as Design Home (an app to simulate home decoration), TVSmiles (an app for quizzes and prizes to win), Coin Dozer (a gaming app), and Line (a messaging app with 220 million active users). The survey was displayed on offer walls, pages shown on the apps, and websites to provide users a list of actions or opportunities that they can take to get rewarded. Users were offered small monetary or non-monetary rewards, including access to premium content (e.g. news articles), virtual rewards (e.g. extra lives in games), gift cards, vouchers, charitable donations, and PayPal cash. The survey is a blind opt-in: online users were offered to take part in a survey, but they did not know the topic of the survey. The conversion rate, that is, the percentage of people who finished the survey after starting it, was 64%. Questionnaires were deemed invalid if respondents completed them in a very short period of time with straight-lined (i.e. several consecutive identical answers on the Likert-type scale) or inconsistent responses. The exclusion of these questionnaires provided us with a total sample size of 2209 citizens.

The sampling process accounted for China's *Internet-connected* population distributions regarding age, gender, and region. Quotas were created based on age (14–65), gender, and region, drawing from the most recent statistics available from the International Data Base of the Pew Global Attitudes Survey (2015), US Census Bureau (2016), and Statista (2016). The data were adjusted for demographic groups' Internet penetration based on data from Pew Global Attitudes Survey (2015) and quotas were created for the three regions (East, West, and Central) from Statista (2016). In order to obtain results that are representative of the census, the collected data were weighted by age, gender, and region with the maximum weight of 2.0. It was especially difficult to get a response from older citizens from the Western region, and citizens in this category were given a weight of 2.0.⁶ Taking into account an estimate of the design effect based on the weights distribution, the overall margin of error for estimates is 2.22%. Table A1 in the Supplemental Appendix outlines our sampling method in greater detail.

The questionnaire consisted of six parts, including sections on demographics, online habits, SCSs (participation, received scores, received benefits and sanctions, believed functions), questions on personal relations, online privacy, and questions on political attitudes. The questions included mixed-question types: rating-scale questions (Likert-type-scale and semantic differential), multiple choice (dichotomous questions, as well as "select one" and "select all that apply"), and open-ended questions. Survey respondents could select and report on different commercial pilots (Sesame Credit, Tencent Credit), as well as local government pilots. Here, a branching logic was developed for certain question combinations.

Tables A2 and A3 in Supplemental Appendix provide an overview of the respondents' main characteristics (unweighted and weighted results) and summary statistics. Based on weighted figures, 39% of the respondents are female and 61% are male, 55% of respondents are aged 14–30, 42% are aged 31–50, and 3% are 51 and above. A total of 20% of the respondents are from Western China, 35% from Central, and 45% from Eastern China. The great majority of respondents (84%) reside in urban areas, not rural areas, which is related to the fact that the Internet penetration rate is higher in urban areas and respondents have been recruited online through websites and mobile phone apps.⁷ In all,

31% of respondents indicate that their monthly net income per person is below 1000 RMB, 46% of respondents have a monthly net income per person of between 1000 and 4000 RMB, 14% of respondents reported monthly income above 4000 RMB, while 9% did not want to disclose their income. A total of 1% of respondents had no formal education, 14% received some high school or secondary school education, 14% completed high school or equivalent, while 71% completed a university degree or equivalent. In all, 68% of respondents were employed, 7% were not employed, 12% in school, university or training, 7% self-employed, and 6% in another category (e.g. retired, disabled).

Data analysis

The dependent variable of interest in our study is the approval of SCSs. As this variable is categorical, we chose ordered logistic regression. The question we asked was the following “How much do you approve of social credit systems?” (您多大程度上赞同社会信用体系?), allowing respondents to select their answer from the following options: 1=strongly disapprove (非常反对), 2=somewhat disapprove (有点反对), 3=neither approve nor disapprove (一般, 既不赞同, 也不反对), 4=somewhat approve (有点赞同), or 5=strongly approve (非常赞同).

Our independent variables are divided into the three categories: individual characteristics and beliefs, characteristics of SCSs, and perceived functions of SCSs.⁸ Individual characteristics and beliefs (category 1) include age, net monthly household income (grouped in three categories: 1=less than 1000 RMB, 2=1000–4000 RMB, and 3=more than 4000 RMB), gender (0=female, 1=male), education (1=no, 2=low, 3=medium, 4=high), urban or rural place of residence (0=rural, 1=urban), and region (East, Central, and West—constructed through the province the respondents selected to live in). We also asked respondents about their online behavior, both concerning the time they spend on their smartphone (1=I don’t have a smartphone, 2=less than 1 hour, 3=1–2 hours, 4=3–4 hours, 5=4–5 hours, and 6=more than 5 hours) and the frequency they post something online (1=never, 2=less often, 3=a few times per month, 4=at least once per week, 5=at least once per day, and 6=many times per day). We also included a variable to measure whether political attitudes have any influence over respondents’ approval of the SCSs. Respondents were asked whether they were members of the CCP and whether they have confidence in the way the government is running the country (1=no confidence at all, 4=full confidence).

With regard to characteristics of SCSs (category 2), factors include magnitude of reported score (this varied from pilot to pilot: for Sesame Credit users from 350 to 950 points, for Tencent Credit users from 0 to 850 points), perceived magnitude of score relative to other family members’ and friends’ scores (1=much lower to 5=much higher). Other characteristics of SCSs include knowledge about how the scores are calculated (1=I don’t understand how it is calculated, 2=I know a little about it, and 3=I know a lot about it), a dummy variable on the respondents’ level of information on the SCSs (0=I haven’t received any information on the SCSs, 1=I have received information on the SCSs), as well as information on whether the respondent joined the system actively or whether it was automatically integrated (a dummy was constructed of the “select all that apply” question, “Why do you use the SCS?” and the response ‘It was automatically integrated into a mobile

payment app that I use': 0=no, 1=yes). In addition, we asked respondents whether their scores are fairly calculated (1=very unfairly calculated to 4=very fairly calculated).

The third category measures different perceived functions of SCSs. To assess perceptions of advantages and disadvantages associated with SCSs, respondents could choose from a "Select all that apply" list (no/any difficulties obtaining a credit, lower/higher interest rates on loans, higher/lower interest rates on savings, fast-tracked/difficulties applying for a visa, deposit-free/deposit-sharing economy services, fast-tracked check-ins/restrictions from public transport or from buying plane tickets, and positive/negative impact on online dating). We used dummy variables that refer to whether a respondent received the respective advantages or disadvantages from their scores (0=no, 1=yes). Furthermore, respondents were asked what they believed the functions of a SCSs would be. On an agreement scale with 1="strongly disagree" and 5="strongly agree," respondents were asked whether SCSs are useful tools to make individuals and companies more honest and accountable for their actions and whether they mind that their personal information is collected if the system improves the quality of life. We also included prompts regarding whether the system is helpful in ensuring that companies abide by regulations (1=not very helpful, 4=very helpful). Table 1 summarizes the hypotheses and expected outcomes of the selected independent variables.

Results and discussion

A first takeaway of our analysis is the surprising extent of commercial SCSs coverage within our respondent population. Fully four out of five respondents (80%) are using at least one commercial SCS, while only 7% were aware of being part of a local government-run SCS pilot, as illustrated in Figure 2. A total of 43% of the respondents lived in one of the 42 localities where local governments started a government-run SCS; of these, only 11% were aware of being part of a local government pilot. This suggests that government-run SCSs are not yet as advanced in scope or progress as often portrayed by a few showcase examples. Among commercial SCSs, Sesame Credit is the most popular system with 58% of respondents reporting membership, followed by Tencent Credit (31%), respectively, while some respondents use both systems (19%).⁹ In all, 16% of all respondents do not take part in any SCS.¹⁰ A relatively small number of people (8%) indicated not knowing whether they were taking part in a SCS or not.

Analysis of SCS approval

Overall, respondents report a high degree of approval of SCSs, with 80% of respondents either somewhat approving or strongly approving SCSs. Only 19% of respondents perceive the SCS in value neutral terms (neither disapprove nor approve) while just 1% reported either strong or somewhat disapproval. To some extent, the high degree of approval of SCSs and the almost non-existent disapproval we found might reflect the nature of conducting a survey in an authoritarian setting—while respondents were clearly informed that the data were anonymized¹¹ and to be used for research purposes only, some more cautious respondents may have falsified their preferences to a degree due to concerns about expressions of disapproval resulting in reprisals from the state.¹² Yet, we

Table 1. SCS approval—hypotheses and expected outcome.

Category		Hypotheses
Socio-demographic	Age	H1: SCS approval is higher among younger citizens.
	Income	H2: SCS approval is higher among citizens with lower incomes.
	Gender	H3: SCS approval is higher among male citizens.
	Education	H4: SCS approval is higher among less educated citizens.
	Urban or rural	H5: SCS approval is higher among citizens living in urban areas.
Online habits	Region (W, C, E)	H6: SCS approval is higher among citizens in the more developed eastern part of China.
	Time on smartphone	H7: SCS approval is higher among citizens who spend more time on their smart phone.
Political attitude	Online post frequency	H8: SCS approval is higher among citizens who post more frequently in social media.
	CCP member	H9: SCS approval increases among citizens who are CCP members.
Magnitude of score	Confidence in government	H10: SCS approval increases among citizens who have high confidence in the government.
	Reported score	H11: SCS approval is higher among citizens who have a high social credit score.
Characteristics of SCSs	Perceived score	H12: SCS approval is higher among citizens who believe they have a higher social credit score than their friends and family.
	Transparency of weights	H13: SCS approval is higher among citizens who understand how it works.
	Receive information	H14: SCS Approval is higher among citizens who received information on the system.
	Method of joining	H15: SCS approval is higher among citizens who actively joined an SCS instead of being automatically integrated.
Received (dis) advantages	Fairness of score	H16: SCS approval is higher among citizens who believe it is a fair system.
	Advantages	H17: SCS approval is higher among citizens who receive actual advantages from using it.
Perceived functions of SCSs	Disadvantages	H18: SCS approval is higher among citizens who receive actual disadvantages from using it.
	Improves accountability	H19: SCS approval is higher among citizens who believe it is a useful tool to make individuals and companies more honest and accountable for their actions.
	Abiding regulations	H20: SCS approval is higher among citizens who believe it is a useful tool to ensure that companies abide by regulations.
	Improves quality of life	H21: SCS approval is higher among citizens who believe it improves the quality of life.

SCS: social credit system; CCP: Chinese Communist Party.

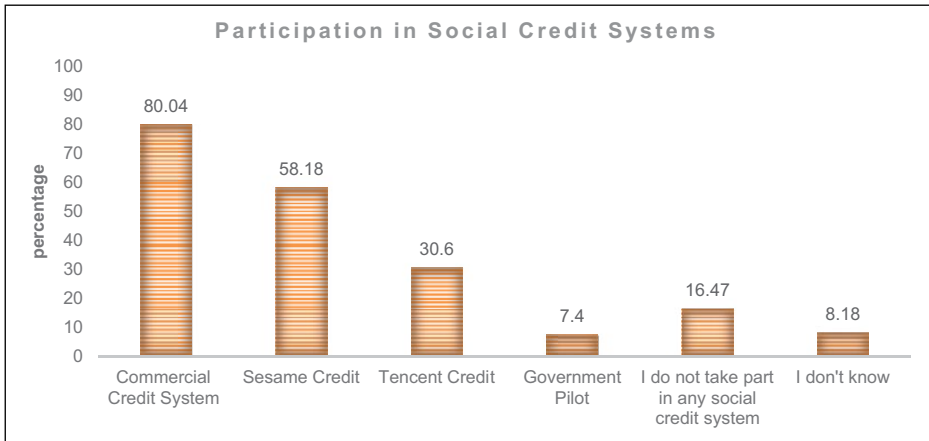


Figure 2. Use of different SCSs (weighted, N=2209).
*Respondents can take part in multiple commercial pilots, as well as a government pilot.

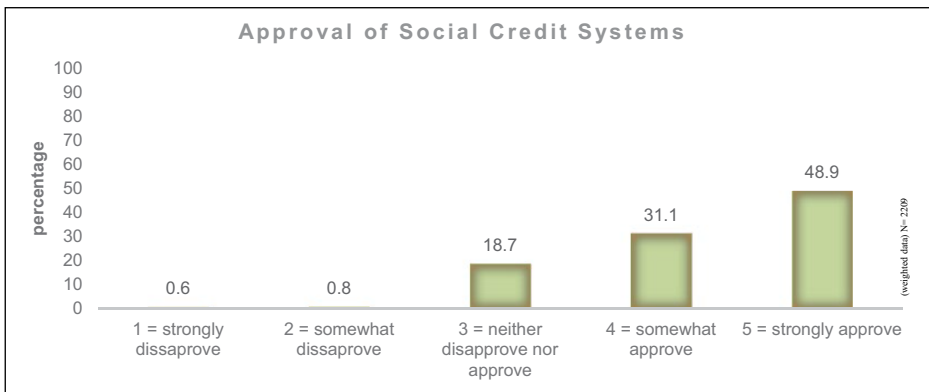


Figure 3. Overall approval of SCSs, in % (weighted).

are confident that such an effect would be marginal not least since half of respondents (49%) indicated *strong* approval of SCSs, suggesting that overall public support is quite robust. Lending support for this view is the fact that only 1% of respondents expressed the view that a nationwide SCS should *not* be implemented. Our semi-structured interviews with citizens of various ages further confirmed these high approval levels. That said, the significant number of value-neutral respondents (neither approve nor disapprove) might suggest the existence of a group of ‘doubters’—1 in 5 Chinese—who maintain a circumspect attitude about SCSs.

Table 2 below summarizes the variation in levels of approval among different groups within our respondent population. Interestingly, approval of SCSs is highest among respondents who are part of a local government SCS pilot, with 64% of these respondents

Table 2. Comparison of SCS approval among different groups (weighted).

	Total		Users of Sesame Credit		Users of Tencent Credit		Users of commercial SCSs		Users of commercial SCSs without using governmental pilots		Citizens part of governmental pilot		Citizens part of governmental pilot without using commercial pilots	
	N=2209	n=1309	n=680	n=1639	n=1510	n=160	n=31							
1 = strongly disapprove	0.60%	0.09%	0.15%	0.14%	0.15%	0.00%	0.00%							
2 = somewhat disapprove	0.75%	0.38%	0.08%	0.37%	0.40%	0.00%	0.00%							
3 = neither approve nor disapprove	18.65%	10.61%	10.85%	12.63%	13.43%	9.73%	34.36%							
4 = somewhat approve	31.11%	31.86%	30.31%	32.22%	32.55%	26.20%	17.37%							
5 = strongly approve	48.89%	57.06%	58.61%	54.65%	53.48%	64.07%	48.27%							

SCS: social credit system.

Table 3. Doubters and socio-demographic characteristics (in %).

	“Doubters”	Total
Age		
14–30	58.77	55.30
31–50	37.63	41.52
51–65	3.60	3.17
Income		
Less than 1000	56.66	30.88
1000–4000	35.13	45.77
More than 4000	8.22	14.05
Gender		
Female	40.54	38.70
Male	59.46	61.30
Education		
No	4.38	1.37
Low	28.39	13.82
Medium	16.60	14.29
High	50.63	70.52
Location		
Rural	26.59	16.39
Urban	73.41	83.61
Region		
West	18.06	19.68
Central	37.91	35.21
East	44.04	45.12

indicating strong approval of SCSs in general (category 1). By contrast, approval of SCSs is lower among respondents who are part of a commercial SCS pilot, with 55% strongly approving of SCSs. This discrepancy could be explained by perceptions, noted in previous research that citizens deem the government as a more trustworthy handler of personal data and generally are more favorably disposed to government SCSs than commercial ones (Ohlberg et al., 2017; Wang and Yu, 2015).

Socio-demographic bivariate analysis

Degree of approval varies across age, income, gender, education, and region, as illustrated in the different graphics in Figure 4. The 51–65 age group shows the strongest approval levels, with 56% of respondents strongly approving of SCSs. SCS approval is also higher among respondents with a higher income. Attitudes among male and female respondents are similar, with male respondents being slightly more positive. Approval is highest in the group of respondents with the highest education and lowest in the group with low education levels. Approval levels are higher in cities than in rural areas (82% vs 68%). There are no significant differences in approval between regions: respondents in West China have a slightly more positive attitude (81% approve or strongly approve),

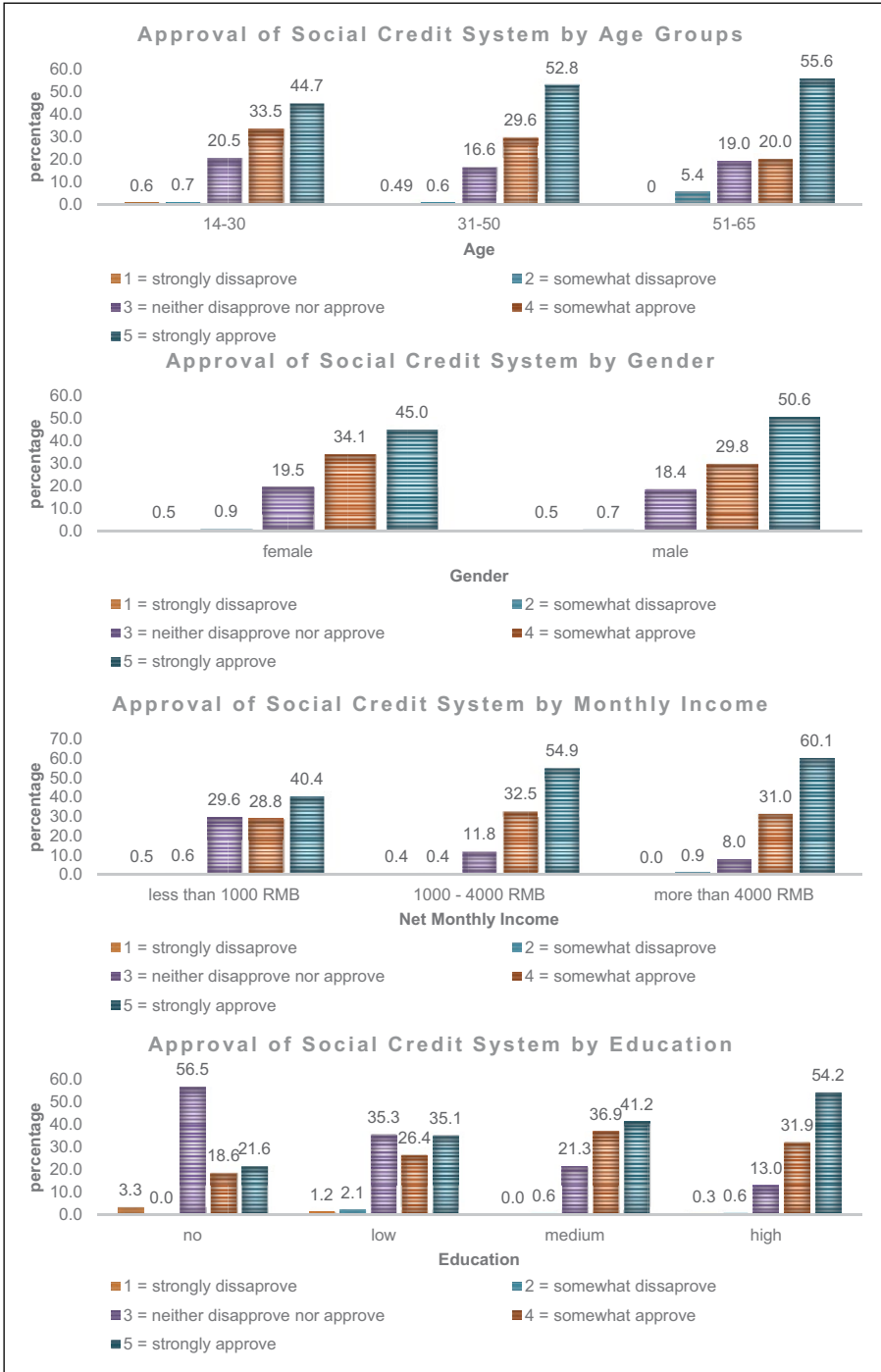


Figure 4. (Continued)

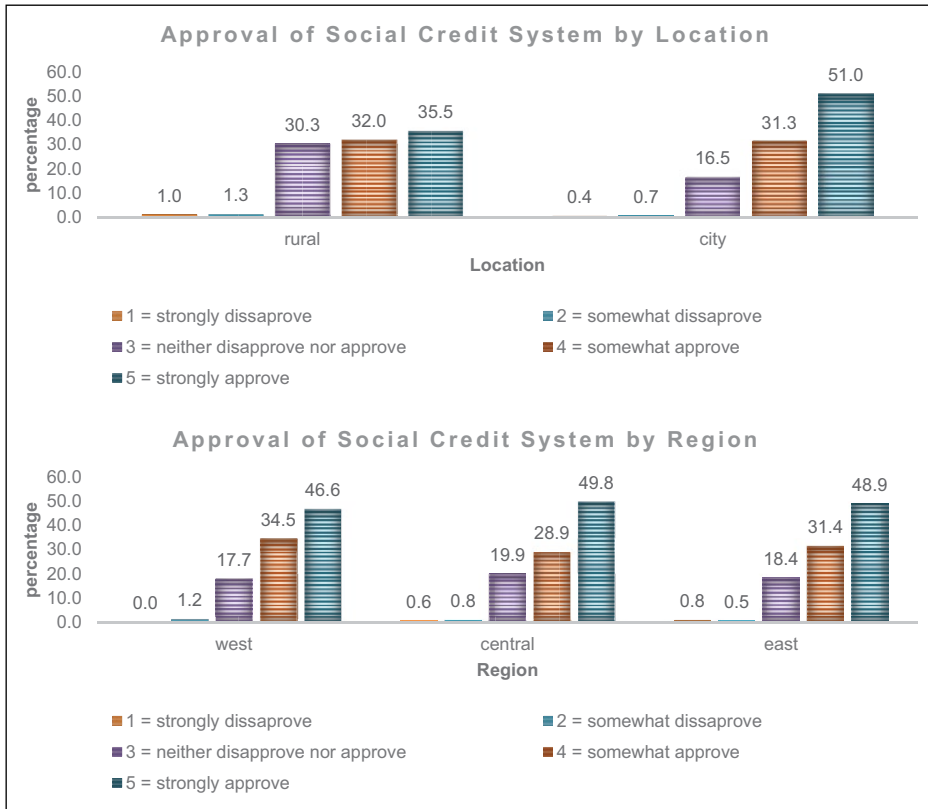


Figure 4. SCS approval by age, income, gender, education, location, and region (weighted, N = 2209).

Education levels are categorized as follows: None=no formal education; low=some high school/secondary school education; medium=completed high school or equivalent; high=completed a university degree or equivalent.

followed by East China (80%), and Central China (79%). Overall, some of these findings are surprising, as current research by Pan and Xu (2018) suggest that in China the young, better-educated, coastal urban residents lean toward liberal views, and there is an expectation that liberals would be more skeptical of SCSs. While we find that younger respondents are indeed less approving of SCSs than the older respondents, somewhat surprisingly the better-educated and wealthier respondents are more approving of SCSs. The discussion section will analyze this apparent tension in greater detail by arguing that urban residents in China receive a wider range of benefits from SCSs and see SCSs through particularly positive frames.

The characteristics of the “doubters,” that is, the 20% of respondents who either strongly or somewhat disapprove or neither disapprove nor approve can be summarized as follows: They are younger, have a very low income, are slightly more likely to be female, have less education, and are more likely to live in rural areas (Table 3).

Determinants of approval of SCSs

In order to measure the explanatory power of different independent factors, we undertake several logit regressions in Table 4. First, we measure socio-demographic characteristics in addition to online habits (model 1 and 2). Second, we run a regression that includes the effects of political attitudes (model 3), the magnitude of SCS score (model 4), different characteristics of SCSs including available information, modes of joining a SCS and the perceived fairness of SCSs (model 5), effects of received (dis)advantages (model 6), and effects on perceived functions (model 7).¹³

The results of our regression on socio-demographics are somewhat surprising (Table 4, model 1). Age, income, gender, education (except for low education), and (urban or rural) location have a statistically significant and positive effect. In other words, respondents who approve of SCSs tend to be older, higher-income, male, more highly educated, and living in an urban area. Among these significant socio-demographic factors, the effect of education is highest, followed by income and urban/rural location. We further find no statistically significant effect of region, which implies that there are no regional effects influencing individual's opinion of SCSs in our sample. In other words, the following hypotheses are not supported by this analysis: Hypothesis 1 (higher SCS approval among younger citizens), Hypothesis 2 (higher approval among citizens with lower income), Hypothesis 4 (higher approval among less educated citizens), and Hypothesis 6 (higher approval in Eastern China). The findings only support Hypothesis 3 (higher approval by male citizens) and Hypothesis 5 (higher approval in urban areas).

We find a non-significant negative effect for time spent on the smartphone (a disconfirmation of Hypothesis 7) and a low but significantly positive effect for frequency of online posting in social media (confirming Hypothesis 8). The ordered log-odds for CCP membership and confidence in the Chinese government are slightly low (0.314 and 0.589, respectively) but statistically significant (confirming Hypotheses 9 and 10). Model 4 finds that no significant effect linking approval and respondents scores in an SCS (disconfirming Hypothesis 11). However, if users believe they have a slightly higher score than their friends and families, the ordered log-odds estimates are high and significant, confirming Hypothesis 12. In addition, the findings show that (believed) knowledge about how social credit scores are calculated is a significant predictor of SCS approval (confirming Hypothesis 13) while receiving information on SCSs has a non-significant effect on approval (disconfirming Hypothesis 14). Actively joining an SCS instead of being automatically integrated is negatively correlated with SCS approval, but the findings here are not significant (disconfirming Hypothesis 15). A very powerful predictor of SCS approval is fairness of personal social credit scores—here, the ordered log-odds estimate is 1.241 with very high significance (confirming Hypothesis 16).

Our analysis further shows that SCS approval is higher among respondents who receive actual benefits with significant ordered log-odds estimates of 0.811 (confirming Hypothesis 17). We find a non-significant negative effect of received disadvantages (e.g. difficulties obtaining a credit, restrictions from public transport, or limited access to sharing economy services), a disconfirmation of Hypothesis 18. The ordered log-odds estimates become very high and statistically significant for all three function variables: The ordered log-odds estimates are 0.775 for the believed function that “SCSs are a

Table 4. SCS approval—explanatory variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Socio-demographics	Online habits	Political attitude	Magnitude of score	Characteristics of SCS	Received (dis) advantages	Perceived functions
Age	0.0147*** (0.00549)	0.0148*** (0.00565)	0.0158*** (0.00580)	0.0147* (0.00877)	0.0286*** (0.00903)	0.0284*** (0.00727)	0.0137** (0.00624)
Income group = 2 (1000–4000)	0.582*** (0.111)	0.456*** (0.116)	0.536*** (0.118)	0.313* (0.172)	0.253 (0.168)	0.308** (0.142)	0.197 (0.131)
Income group = 3 (more than 4000)	0.732*** (0.154)	0.585*** (0.163)	0.637*** (0.163)	0.343 (0.217)	0.0555 (0.224)	0.375** (0.185)	0.162 (0.191)
Gender	0.194** (0.0964)	0.222** (0.0991)	0.207** (0.101)	0.293** (0.132)	0.414*** (0.135)	0.214* (0.116)	0.196* (0.114)
Education = 2 (Low)	0.653 (0.555)	1.076* (0.612)	0.261 (0.643)	-0.245 (1.589)	-13.03*** (0.729)	-0.553 (1.493)	-1.033* (0.539)
Education = 3 (Medium)	1.141** (0.548)	1.541** (0.606)	0.802 (0.639)	0.0335 (1.574)	-12.85*** (0.703)	-0.468 (1.486)	-0.593 (0.522)
Education = 4 (High)	1.386** (0.541)	1.733*** (0.601)	1.018 (0.627)	0.0829 (1.561)	-12.63*** (0.676)	-0.272 (1.475)	-0.638 (0.517)
Urban or rural	0.326** (0.134)	0.320** (0.136)	0.247* (0.138)	0.320 (0.197)	0.130 (0.206)	0.348** (0.173)	0.156 (0.167)
Region = 2 (Central)	0.101 (0.126)	0.0840 (0.129)	-0.0497 (0.132)	0.0821 (0.173)	0.211 (0.179)	0.132 (0.152)	0.133 (0.150)
Region = 3 (East)	-0.00187 (0.115)	-0.0466 (0.118)	-0.0418 (0.123)	0.123 (0.157)	0.266* (0.160)	0.135 (0.141)	0.165 (0.137)
Time on smartphone		-0.0231 (0.0324)					

Table 4. (Continued)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Socio-demographics	Online habits	Political attitude	Magnitude of score	Characteristics of SCS	Received (dis) advantages	Perceived functions
Online post frequency		0.179*** (0.0351)					
CCP member			0.314*** (0.124)				
Confidence in government			0.589*** (0.0716)				
Sesame score				-0.0714 (0.119)			
Perceived score relative to friends				0.546*** (0.0889)			
Transparency of weights					0.339*** (0.113)		
Receive information on SCS					0.615 (0.428)		
Method of joining					-0.107 (0.310)		
Fairness of score					1.241*** (0.133)		
Received advantages						0.811*** (0.210)	
Received disadvantages						-0.101 (0.130)	

Table 4. (Continued)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Socio-demographics	Online habits	Political attitude	Magnitude of score	Characteristics of SCS	Received (dis) advantages	Perceived functions
Improves accountability							0.775*** (0.103)
Abiding by regulations							1.732*** (0.122)
Improves quality of life							0.766*** (0.0611)
Constant cut1	-3.346*** (0.711)	-2.584*** (0.769)	-2.006** (0.829)	-4.008** (1.931)	-13.31*** (1.436)	-5.389*** (1.851)	3.394*** (0.873)
Constant cut2	-2.363***	-1.599**	-0.921	-2.654	-11.57***	-3.378**	5.372***
Constant cut3	(0.605)	(0.669)	(0.735)	(1.700)	(1.088)	(1.585)	(0.676)
Constant cut4	0.940*	1.730***	2.344***	0.748	-8.811***	-0.195	9.721***
	(0.565)	(0.647)	(0.711)	(1.646)	(1.007)	(1.547)	(0.677)
	2.523***	3.345***	4.016***	2.800*	-6.362***	1.699	12.66***
	(0.571)	(0.655)	(0.718)	(1.646)	(1.014)	(1.543)	(0.721)
Observations	1944	1929	1815	1100	1135	1390	1826

SCS: social credit system; CCP: Chinese Communist Party.
 The dependent variable is "approval of SCSs" (1 = strongly disapprove, 2 = somewhat disapprove, 3 = neither disapprove nor approve, 4 = somewhat approve, and 5 = strongly approve); numbers without brackets refer to ordered log-odds (logit) regression; numbers in brackets are the standard errors of the individual regression coefficients.
 ***p < 0.01; **p < 0.05; *p < 0.1.

useful tool to make individuals and companies more honest and accountable for their actions” (confirming Hypothesis 19), 1.732 for the believed function that “SCSs are useful to ensure that companies abide by regulations” (confirming Hypothesis 20), and 0.766 for the believed function that “SCSs improves the quality of life” (confirming Hypothesis 21).

Discussion

Overall, the most interesting outcome might be the unexpected findings with regard to individual characteristics and beliefs. Following the findings of Pan and Xu (2018), we expected to find that younger, well-off, better-educated respondents would be less likely to support SCSs due to concerns of infringement on privacy rights and political freedom—after all, ensuring protection of the private sphere from government encroachment is a mainstay of liberal thought going back to John Locke. While younger respondents in our sample do seem to be relatively more circumspect about SCSs, older “elites” (better-educated and wealthier) are overwhelmingly positive about SCSs.

The findings further show that there is less approval for SCSs in rural areas. One potential explanation is that respondents in rural areas are less familiar with SCSs and hence more skeptical. About 43% of respondents in rural areas reported not knowing how their social credit score is calculated, while this was the case for 36% of respondents in urban areas. Another and perhaps more satisfying explanation could be that respondents in rural areas might not have had equal access to the benefits and services offered by SCSs.¹⁴ A total of 87% of rural citizens and 88% of urban citizens received some type of benefit or advantage as a result of joining a commercial pilot. However, Table 5 shows that urban respondents received a *wider range* of benefits. For example, 37% of commercial pilot users in urban cities had obtained a credit without difficulty, while this ratio was only 31% for rural citizens. The SCSs’ benefits schemes also have a strong urban bias as sharing economy services and travel-related incentives might be less relevant for rural citizens. For instance, using deposit-free rental bikes or cars as a benefit might be less applicable to rural areas with lower population density; in urban areas, 40% of users reported using this as a benefit, while in rural areas the figure dropped to 32%. Moreover, 14% of urban residents had received a fast-tracked visa, while this was the case for only 11% of rural residents, presumably because urban residents travel abroad more frequently than rural residents.

About 29% of respondents in rural areas also reported to have received some type of disadvantage as a result of their participation in an SCS, while fewer urban respondents reported having received disadvantages (25%). For instance, 5% of rural respondents reported difficulties in obtaining credit because of their social credit score, whereas this was only the case for 2% of respondents in urban areas. A few interviewees also perceived benefits from commercial SCSs as biased against rural citizens as they “do not have as good use for benefits (as compared to city residents) and most importantly, because they are limited by income and other factors to increase their score” (Interview 4, June 2018).

The results are also interesting with regards to particular characteristics of SCSs (category 2). While the actual magnitude of respondents’ scores is not a significant

Table 5. Commercial SCSs—advantages and location ($N = 1549$, weighted).

Advantages	Rural area	Urban area
Obtained credit without difficulties	31%	37%
Received lower interest rates on loans from my bank	12%	18%
Received higher interest rates on savings from my bank	9%	11%
Received a fast-tracked visa	11%	14%
Used deposit-free sharing economy services (such as a rental bike or car)	32%	40%
Used fast-tracked check-ins for hotels or flights	28%	35%
Experienced a positive impact on my online dating	4%	4%

SCS: social credit system.

predictor for SCS approval, what does matter is whether or not respondents *believe* that they have a slightly higher score than their family members and friends (60% of all respondents). Moreover, the perceived fairness of social credit scoring plays an important role in public support for SCSs. In interviews, concerns about the unfairness of scoring methods were repeatedly raised, ranging from difficulties in credit repair to scores being too homogenized (Interview 8, June 2018; Interview 9, July 2018). One interviewee, for instance, noted that “personal difficulties, debt accumulation because of sickness, and other family reasons can result in a low social credit score, and one should not judge someone based on their low score, it is simply unfair” (Interview 8, June 2018). Others raised concerns that the scoring system might not apply for all as “people in powerful positions of responsibility might escape punishments, which is unfair” (Interview 10, July 2018).

Finally, with regards to perceived functions of SCSs (category 3), the survey findings suggest that citizens perceive SCSs not as an instrument of “surveillance” but instead as an instrument to improve “quality of life” and to close “institutional and regulatory gaps” leading to more honest and law-abiding behavior in society. SCSs are viewed within the context of technological progress and are understood as a means of improving life quality. The various benefits provided via SCSs are seen as very convenient and attractive. For instance, one interviewee reports that “sometimes there is not enough money left in Alipay and Sesame Credit can be used for ordering delivery food. This is convenient and increases life quality” (Interview 5, June 2018).

Our finding that respondents associated SCSs with the functions “improve accountability and honesty” and “abide by regulations” suggests that SCSs are also perceived as useful tools that help to increase trust in society and close particular institutional and regulatory gaps. One such institutional gap is the underdeveloped financial credit rating system which has made it very difficult for households to access credit (Interview 2, March 2018; Pang, 2017). Commercial SCSs such as Sesame Credit are seen as valuable because they offer their own banking services with attractive interest rates for loans and saving accounts for their users. In addition, SCSs are seen to address regulatory enforcement issues ranging from food safety and non-compliance with environmental regulations to rising Internet scams. For instance, in a context of frequent food safety scandals, government SCS pilots

such as the Honest Shanghai app offer users additional “reliable” information to check whether restaurants are “trustworthy” and abide by food safety regulations.

Overall, the perceived function of SCSs to resolve regulatory enforcement issues is tightly linked with citizens’ perceived “lack of trust within society.” In all, 76% of the respondents in our survey stated that they believe that there is an issue of mutual mistrust between citizens in China’s society. One interviewee also stressed that there was a need to “generate a guide and norm for personal social behavior with the Chinese society. It could improve the efficiency of social operations” (Interview 9, July 2018). Another interviewee explains as follows:

SCS can create trust in society through feedback mechanisms. People with bad credit will be less likely to be employed and it will not be easy for them to access more funds in the future. Such punishments provide feedback to people with bad behavior to restrain themselves. Step by step, SCSs will create trust in society. (Interview 5, June 2018)

Another interviewee notes the following:

Take, for instance, the example of using shared bikes. If someone does not lock a shared bike after using it properly, her or his own credit will be influenced. Alipay can collect such very detailed information from different aspects in life and include this in a score. Through such detailed accounting, SCSs can track individuals’ actions and create trust in society. (Interview 10, June 2018)

Our findings plausibly also reflect China’s authoritarian political context in which the survey was conducted. Interviewees were conceivably less concerned that SCSs provide data for surveillance and social control purposes since many would assume that the Chinese security apparatus is able to access to any such information already (e.g. Interview 6, June 2018; Interview 7, June 2018; and Interview 8, June 2018). One interviewee summarizes this view as follows:

All data is accessible to the CCP already. For instance, during the registration for primary school, people must provide detailed family information. So, I do not think that there is any point in worrying about the Party having access to data through the SCS, because it is inevitable that all data is accessible to the CCP. (Interview 7, June 2018)

Another interviewee notes that “the collection of private personal data depends on the consciousness and governance of the Party. If personal data is used for good reasons, I think it is acceptable” (Interview 8, June 2018.) The positive views among the respondents are no doubt also influenced by how Chinese media report on SCSs and how little room it has for critical debates on surveillance and privacy issues.

A limitation of our study is that the query about approval of SCS in general (社会信用体系 *shehui xinyong tixi*) did not differentiate between governmental pilots or commercial systems. In the future, such research could differentiate between the two system since their aims and operation are quite distinct. Yet, other queries in our survey suggest that citizens do differentiate between government-run and privately run SCSs. Figure 5 shows that 59% of respondents believe that the central government

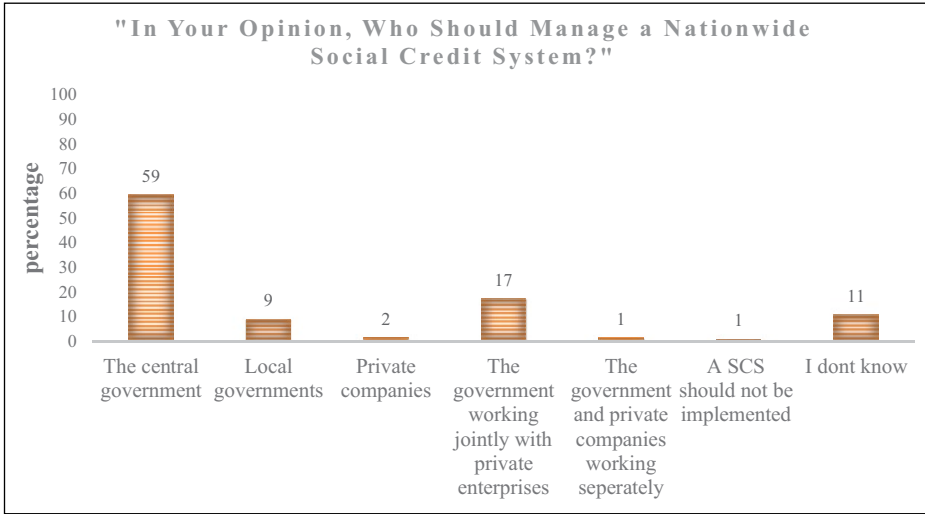


Figure 5. Public opinion of who should manage a nationwide SCS, in % (weighted, N=2209).

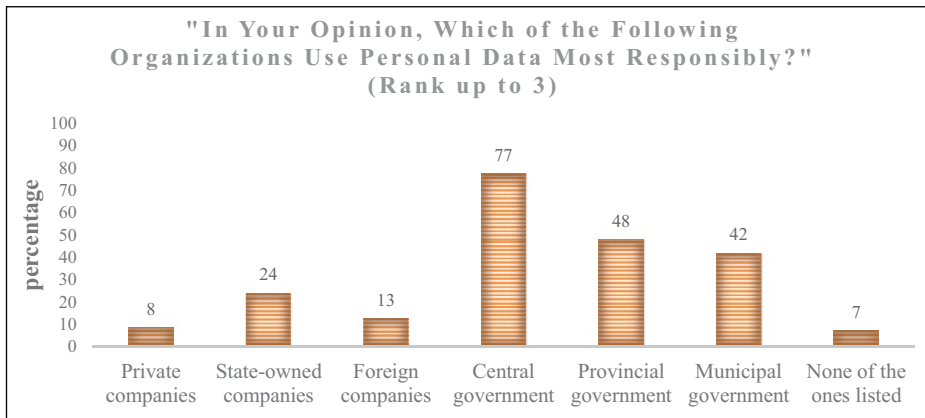


Figure 6. Public opinion on responsible data use by different organizations, in % (weighted, N=2209).

should be responsible for management of a nationwide SCS, while just 9% believe that local governments should take the lead.¹⁵ These results echo previous finding of “hierarchical trust” meaning that Chinese citizens tend to have high degrees of trust in the central level and much less trust in local authorities (Li, 2016; Tang, 2016). Our findings also suggest a degree of skepticism about the motives of private players involved in SCS schemes. Only 17% of respondents believe that the government should work jointly with private enterprises and less than 2% believe private companies should manage a nationwide SCS. Figure 6 shows that respondents believe that

personal data are used most responsibly by the central government (77%), followed by the provincial government (48%), the municipal government (42%), state-owned companies (24%), foreign enterprises (13%), and private enterprises (8%). Responses to these two questions would suggest that approval levels are likely to be higher for government pilots than commercial systems.

Conclusion

While previous studies point out that the emerging SCS is designed as “state surveillance infrastructure” and as a tool for social management (Hoffman, 2017; Liang et al., 2018), this article underscores that these purposes are not foremost in the minds of Chinese citizens. Based on a national survey representative for the Internet-connected population in China, the study shows that SCSs are already widely used in China with more than 80% of respondents using a commercial SCS and 7% of respondents reporting participation in a local government SCS. The findings show very high levels of approval across respondent groups. Interestingly, strong supporters of SCSs are more likely to be older, have a higher income, male, more highly educated, and live in urban areas.

At first glance, it seems counterintuitive that wealthy and better-educated citizens support government-run and privately run SCSs that potentially influence citizens’ economic, political, and social freedom and opportunities. One explanation for this high degree of approval could simply be that wealthier educated urban citizens are technology-savvy and are more open to technological change (i.e. SCSs are seen as technological progress). In this article, two different arguments are proposed. First, the better-educated and wealthier citizens, particularly in urban areas, have access to a wider range of benefits from the SCSs. As the primary beneficiaries of these reputational systems, it follows that they would express highest levels of approval. Second, wealthier educated urban citizens perceive and interpret the function of SCSs through frames other than data privacy. The survey results and interviews show that citizens perceive SCSs not as an instrument of surveillance, but as an instrument to improve the quality of life and to close institutional and regulatory gaps, leading to more honest and law-abiding behavior in society. In China, many citizens do not have access to credit cards, partly because traditional banking institutions have insufficient capacities to assess citizens’ financial creditworthiness. Against this background, citizens see SCSs as a helpful (second-best) alternative to making things work.

Finally, SCS initiatives are currently still at a pilot phase, and it is conceivable that public opinion could shift as the systems acquire a more definite form. We surmise that, first and foremost, the balance of rewards and punishments doled out via SCSs will shape how the systems are perceived in the future. As shown in this study, only a small minority of respondents living under government-run SCSs were actually aware of this fact. As SCS pilots continue to develop, it is possible that the more punitive elements of SCSs will come into wider use and this would likely dampen some citizens’ enthusiasm. Furthermore, our findings show that many citizens’ positive appraisal of SCSs is linked to their view that fair and transparent methods are used to determine social credit rankings. Yet, at present, the algorithms used to calculate individual scores are actually not

in the public domain. If these methods remain opaque, it could also erode public support over time. Our analysis also suggests that citizens' perception that scores are calculated impartially is a condition of their approval. In interviews, respondents expressed concerns about what they perceived as unfair scoring methods, with some worrying that the same standards might not apply to "people in powerful positions." Yet, the government has a powerful instrument with which to maintain positive impressions of SCSs in its control of state media which continues to paint a rosy picture about the SCSs, issue framing that our analysis suggests has been quite successful.

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Supplemental material

Supplemental material for this article is available online.

Notes

1. There is some controversy surrounding the speed and feasibility of moving from local pilots to a nationwide unified SCS by 2020 (or beyond), see, for example, Meissner (2017).
2. Local government SCS pilots differ greatly in terms of target groups, type of assessments, responsible agencies, transparency, and level of digitization.
3. There are parallels to be drawn to Foucault's (1995) writing about the disciplinary effects of the "panopticon" of which

the major effect [is] to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power. So to arrange things that the surveillance is permanent in its effects, even if it is discontinuous in its action. (p. 200)

4. The existing literature on SCSs does not offer insight into how different citizen groups perceive government and commercial SCS pilots or whether they differentiate between them. However, previous research has found that different demographic sections of the Chinese population have varying levels of trust in the government, private business, and other citizens. Chinese citizens generally have a comparatively high level of trust in China's political institutions (Li, 2004; Tang, 2005; Wang, 2005), although trust levels are higher for the central government and declines at lower administrative levels (Li, 2004). Tang (2005) finds that older citizens have higher levels of political trust, while better-educated citizens have lower levels of political trust. Gender and residence status (rural or urban) do not have a significant impact on levels of political trust in China. Chinese citizens have traditionally also been more skeptical toward private enterprises compared with other forms of firm ownership, a legacy

from the Maoist period of disdain for private capital as a “tail of capitalism” that should be cut off (Garnaut and Song, 2004).

5. A river panel does not include a fixed number of potential survey respondents, as the survey is displayed on offer walls within apps and websites and can thus potentially reach millions of users. The figure of 350,000 users refers to the estimated volume of users likely to be exposed to a survey offer and, therefore, could potentially choose to take a survey.
6. In order to increase the share of responses from citizens in Western China, we dropped the gender quota for respondents aged between 40 and 65 and included more responses from male citizens in Western China. Since the older population has a larger weight, the share of men overall increases in the weighted sample. The current sample is not optimal because, despite applying weights for gender, age, and region, younger and male citizens are slightly overrepresented in the sample. Given the used method of river sampling, active and tech-affine citizens are also most likely overrepresented in our sample. Post-stratification is a useful tool to improve the representativeness of a sample. However, for questions we considered to post-stratify on, relevant official data are only available at the national level and not concerning geographical, gender, or age distribution. Therefore, we decided to use weighted data and not to post-stratify.
7. In 2017, only 27% of Chinese Internet users were living in rural areas (Statista, 2018).
8. Some respondents might have felt that some questions were sensitive. Here, we often provided respondents with the option to click ‘I don’t want to answer’. However, one can expect that some respondents provided more positive answers. While the overall SCS approval rate might be overreported, in the analysis the focus is also on the variation in approval and not just the overall levels.
9. A total of 63% of the Tencent Credit users also use Sesame Credit, while the remaining 37% use Tencent Credit only.
10. As respondents were sampled from an online survey panel, one can assume that there is an “opt-in” bias because people who opt into a SCS might also be more likely to join an online survey. In other words, one could expect the actual user rate of commercial SCS pilots to be lower than the rates reported in this survey.
11. We did not collect any personally identifiable information (i.e. name, email, and phone number). The most detailed information we have on the respondent is the public IP address that they used for the survey, but this is not traceable to an individual because these are public addresses used by many people at the same time.
12. Despite the challenges of conducting public opinion research in authoritarian China, experienced survey researchers argue persuasively that respondents do not systematically falsify their preferences (Tang, 2005).
13. No multicollinearity was found among the explanatory variables included in the models (see Table A4 in Supplemental Appendix).
14. These findings confirm other studies on the “digital divide” in China, see for instance Zhang et al. (2013).
15. Interestingly, respondents believing that the central government should manage a nationwide SCS are more likely to be male, have a higher income, are more highly educated, and live in urban areas.

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Author biography

Genia Kostka is a professor of Chinese Politics at the Freie Universität Berlin and a Fellow at the Hertie School of Governance. Her research and teaching interests are in digital governance, environmental politics, and political economy with a regional focus on China.