Information Asymmetry and Public Support for Social Credit Systems in China*

Xun Cao
Penn State University

Genia Kostka
Freie Universität Berlin

Xu Xu†
Stanford University

Abstract

China's social credit system (SCS) is created in a civil-law tradition to foster law and order, but its unconstrained power may shape citizens' social and political life in a dangerous direction. What makes citizens ignore the SCS's repressive potential to show overwhelming support? We argue that citizens are inherently uninformed for the following reasons: (1) the SCS entails *invisible*, targeted repression, (2) government information control exacerbates citizens' information problem, and (3) citizens' isolation of discredited peers makes targeted repression even more secret. We examine the informational cause of support for the SCS using a nationwide survey of over 2,000 Chinese netizens and a field survey of over 750 college students in three regions of China. We show that citizens' support for the SCS are positively associated with their exposure to state media and tendency to isolate discredited friends. A survey experiment further finds that framing the SCS as a social-order-maintenance tool does not further increase public support, but revealing information on the SCS's repressive potential significantly reduces people's support. Overall, the support for the SCS due to citizens' ignorance of repression implies that the government can use the SCS for more intensive repression without encountering much resistance from society.

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†Corresponding Author. Email: xuxu@stanford.edu

1 Introduction

While the technological advancements in metadata collection and artificial intelligence (AI) have made people's life much more convenient, they provide governments and big tech companies with powerful new tools to intervene society. Over the past decade, the Chinese government and e-commerce companies have developed various forms of social credit systems (SCS) that reward and punish citizens, organizations, and companies based on the assessments of their "trustworthiness". Through advanced surveillance technologies, a SCS collects huge amounts of personal, financial, and behavioral information to construct social scores for citizens.[1] Low-credit citizens are banned from flights, fast trains, hotels, good schools, social benefits, government jobs, etc. Some are punished for their political conduct (Wang 2017). The SCS has raised a concern that China is turning into an Orwellian surveillance state because this system enables the government to monitor and shape every aspects of citizens' life.[2] Yet, opinion surveys find incredibly high levels of public support for the SCS in China (Kostka 2019). Why Chinese citizens support a powerful surveillance tool that could potentially impose substantial political costs on them? This paper argues that citizens in an authoritarian regime are inherently uninformed about the SCS's repressive potential due to the secret nature of repression through social scoring and government information control.

Weak rule of law is common in authoritarian systems because dictators are reluctant to tie their own hands with independent judiciaries and legislatures. It often results in widespread corruption, incivilities, violations of contracts, and social distrust in authoritarian societies.[3] Since both citizens and dictators desire better law and order, a social-scoring

[1]Note that different local governments and e-commerce platforms have different social credit systems in China, but hereafter we use "the social credit system" to represent government-run social credit systems in general.

[2]Numerous academic and news articles expressed such a concern. See, for example, Hoffman (2017); Liang et al. (2018); Jiang and Fu (2018).

[3]The link between institutional checks on executive discretion and rule of law is a canonical argument in political science and economics (e.g., Hayek 1973; North and Weingast 1989; Olson 1993). Empirical evidence also finds that democracy is associated with better rule of law when economic inequality is lower (Sunde, Cervellati and Fortunato 2008).

system that rewards law-abidance and punishes violations seems to be a viable option. With the help of big data technology, China's social credit system was created to promote social order and improve trust in society. This order-maintenance function is an important reason behind public support for the SCS in China. However, despite its promise of social order maintenance, the SCS is of great repressive potential. The SCS follows a civil-law tradition because the social score "judges" are sovereign-controlled entities such as courts, state-owned banks, police, and various government bureaus. Besides, most of these social-score "judges" are extralegal entities (except for courts), which means violations are punished outside the legal system. Precisely for the reason behind weak rule of law in dictatorships, these entities have unconstrained power to abuse the SCS for political repression. For example, Chinese local governments have used the system to blacklist journalists and repress protesters (Gan 2019; Wang 2017). Abundant evidence suggests that repression through the SCS is common. What makes the SCS particularly attractive to repressive apparatus is that repression under the SCS is intrinsically secret.

First, the SCS is basically a digital surveillance system because generating a social score for each citizen requires massive information concerning citizens' social, personal, financial, and political activities. With detailed information, the government can identify political opponents for targeted repression. Punishment through the SCS is easy because the government can simply lower an individual's score to restrict her access to a variety of services and benefits or to elicit social sanctions. Unlike overt, indiscriminate repression that often cause citizen backlash, targeted repression under the SCS takes low-intensity forms,[4] which are usually *invisible* to the public and hence less provoking.[5] Second, citizens' information problem is further exacerbated by information control in dictatorships. Censorship helps the government conceal targeted repression even if it is revealed. The propaganda of the SCS is effective in the name of fostering trustworthiness in society. Both tools can prevent citizens

[4]Way and Levitsky (2006) define low-intensity repression broadly to indicate the state's various efforts to suppress opposition activity. Punishment through the SCS clearly fits into this category.

[5]Unless the government want to publicize some cases to discourage future violations, which are often not related to political repression.

from knowing the SCS's repressive potential. Third, social scoring systems encourage citizens to isolate discredited individuals because low credits signal untrustworthiness. Since political "misconduct" is mixed with other behaviors to construct a *unified* social score representing trustworthiness, the tendency to stay away from untrustworthy individuals makes it even harder for citizens to discover targeted repression behind someone's low score. As a result, citizens are severely impeded from knowing the SCS's repressive potential.

The information asymmetry between the government and citizens is of crucial importance for understanding public opinion about the SCS because it affects citizens' *perceived* social benefits and political costs. It suggests that citizens' support is influenced by their lack of information about the SCS's repressive potential, which is exacerbated by state information control and the social isolation of low-score individuals. We test these predictions using a nationwide survey of over 2,000 Chinese Internet users and a field survey of over 750 university students in three regions of China. We find that citizens' exposure to state media and tendency to isolate discredited friends are positively associated with their support for the SCS. The findings are not driven by individuals' risk preference, credulity, obedience, and social desirability bias, and are robust to a variety of model specifications.

A direct prediction from this information argument is that reminding citizens the SCS's role in social order maintenance should not further increase their support because such information is dominant in media and society, but revealing information concerning the SCS's role in political repression should decrease public support. We use an experiment embedded in the field survey to test these predictions. Individuals are randomly assigned to different information treatments about the roles of the SCS: social order maintenance, political repression, or both. The evidence is consistent with our predictions. To further test this information mechanism, we examine the heterogeneous effects of the repression information treatment among citizens with different levels of information. Since the social credit system has not been implemented nationwide, a majority of citizens only know about the SCS from state media outlets and/or other indirect sources. This allows us to construct a proxy

for citizens' informativeness. We find that the treatment effect of repression information is stronger on less informed citizens, i.e., citizens who obtained information only from state media.

One might be concerned that the repression information treatment may not reflect the reality of SCS practice in China. Had the government not used the SCS for political repression, the reason behind the reduced support in our experiment would not be citizens' lack of information but this unrealistic framing. We address this concern from three aspects. First, we carefully discuss the logic behind potential power abuse through the SCS and argue that preventing local governments from using the SCS for repression is almost impossible (Section 2.1). Second, we provide anecdotal evidence that the repression of journalists, protesters, human rights lawyers, and political activists through the SCS is quite common among Chinese localities (Section 3). Third and more importantly, we show that revealing the SCS's repressive potential has a weaker effect among better-informed individuals (Section 5.2), which suggests that some citizens may have already known the SCS's repression function. These heterogeneous effects highlight the role of information in influencing public opinion about the SCS in China.

This paper contributes to a growing body of literature on state surveillance and repression. In the past two decades, the world has witnessed a rapid expansion of digital surveillance in dictatorships. Recent scholarship finds that autocratic governments use domestic digital surveillance as a survival strategy in countries such as Russia (Haraszti et al. 2010, p. 27), Turkey (Çelik 2013), Egypt (Gohdes 2014, p.34), Bahrain (Marczak et al. 2014), and Syria (Gohdes 2014, p.91). Technologies such as spyware, metadata collection, high-resolution cameras, facial recognition, and artificial intelligence have empowered dictators to identify demonstrators and political opponents for physical repression (Gunitsky 2015; Qin, Strömberg and Wu 2017). Xu (2020) further shows that digital surveillance not only increases targeted repression, but also leads to a reduction in welfare provision because repressing key opponents prevents coordinated mobilization so that dictators have

less incentive to redistribute. While previous studies have examined the various impacts of digital surveillance on state and society, we know much less about citizens' attitudes toward surveillance. This paper shows that citizens in dictatorships may actually support digital surveillance (e.g., the social credit system) when its repressive potential is invisible to the public. This invisibility partially explains why in authoritarian countries digital surveillance has rapidly expanded without encountering much resistance from citizens.

Since the onset of the big data era, there has been a voluminous literature on how data and AI technologies transform people's economic, social, and political lives (e.g., Jones and Tonetti 2019; Liu 2018; Beraja, Yang and Yuchtman 2020). More recently, China's social credit systems have received considerable attention in both media and academia (e.g., Engelmann et al. 2019; Kostka 2019; Wang 2017). From a theoretical perspective, Tirole (2020) develops a comprehensive model to explore the good and evil aspects of social score systems. A particular insight from Tirole's model is that social score systems enable the state to leverage social sanctions to suppress dissent or force citizens to conform to its rules. Empirically, Kostka and Antoine (2019) find that citizens reported behavior changes in response to the SCS in China, suggesting that the SCS is a powerful tool of social engineering. This paper contributes to the literature by highlighting the information asymmetry between the state and citizens concerning the SCS's repressive potential. This information asymmetry is an important reason behind the power-abuse problem that has always been mentioned but yet to be explained in existing literature: the government can easily abuse the SCS for political control.

The theory and evidence from this paper speak to the massive literature on the liberty-security trade-off (e.g., Davis and Silver 2004). Recently, Bryant and Esarey (2019) find that voters do not punish elected officials for violating human rights in the U.S. Conrad et al. (2018) show that American support for torture increases with repression. Dietrich and Crabtree (2019) suggest that citizens are willing to support the state violating their rights in exchange for the promise of greater security. A common argument in this literature is

that citizens sacrifice freedom for security and thus support state coercion, especially when they do not consider themselves victims of state coercion. This paper adds to the existing literature in three important ways. First, it highlights that citizens may have insufficient information about the political costs of state coercion. Second, it finds that citizens decrease support for coercion even if information revealed that *other* citizens (not themselves) suffer the political costs. Third, the evidence in this paper suggests that public opinion on state coercion is prone to state information control.

This paper is also related to the large literature on state repression in dictatorships. Scholars distinguish between "high intensity" repression such as publicly visible acts targeting elite opposition leaders, larger groups of citizens, or opposition organizations and "low intensity" repression targeting individual dissidents with physical, financial, or psychological coercion (Way and Levitsky 2006). In stable dictatorships, low-intensity, targeted repression is more frequently used as an everyday tool of repression to control dissent (Dragu and Przeworski 2019; Truex 2019) than "high intensity" repression due to the latter's huge costs (Way and Levitsky 2006; Sullivan 2016). Recent studies have established the link between digital surveillance and low-intensity repression (Gohdes 2015; Xu 2020). This paper contributes to the literature by highlighting the role of social scoring systems in state repression and emphasizing the secret nature of this type of repression.

It is important to note that although repression practice through China's SCS is quite evident, it has yet to become an Orwellian-style repressive tool. We do not advance that a big-data enabled social scoring system inevitably leads to dystopic outcomes. Besides, department conflicts, data quality and standardization issues, and firm interests in data protection may hamper the government's effort in developing an integrated nationwide SCS in China. Nevertheless, our findings imply that the government can take advantage of citizens' lack of information and use the SCS for more intensive repression without encountering much resistance from society. The risk of abuse is substantial because the SCS is an extension of a "civil-law" system in which most social score "judges" are government entities with

unconstrained power. In authoritarian regimes where the government constantly faces the threat of mass mobilization and constraints on the executive are ineffective, the secret nature of repression under the SCS and the enormous power of social scoring in shaping citizens' behavior would make the SCS an ideal tool for political control.

2 Theory and Hypotheses

China's social credit system is relatively new, but the idea of social scores have been advanced by a variety of e-commerce and ride-hailing platforms such as eBay, Amazon, Taobao, Uber, Airbnb among many others. In this section, we first compare China's social credit system with the rating system in an e-commerce platform—Taobao—in authoritarian settings. We then present our main argument concerning information asymmetry and support for social scoring systems in dictatorships. Note that in this section we focus on the key theoretical concepts of the SCS while leaving its policy background to discuss in the next section. This is because, although China's social credit system is unique, a general theory of social scoring systems in authoritarian settings has broad implications.

2.1 The Civil-Law Tradition of China's Social Credit Systems

Weak rule of law is an intrinsic feature of authoritarian regimes. Unlike Western democracies where legal development involved legislatures and independent judiciaries that ultimately constrain executive discretion, authoritarian regimes are reluctant to create well-functioning legal infrastructure since an independent legal system likely makes the dictator worse-off (e.g., by threatening the dictator's privileges or raising the likelihood she will be replaced) (Liu and Weingast 2017). Consequently, authoritarian societies are struggling with incivilities, corruption, fraud, contract enforcement problems, high transaction costs, and widespread mistrust among citizens. Scholars indeed find that authoritarian rule is an important source of social distrust (e.g., Xu and Jin 2018). From the dictator's perspective, weak rule of law stagnates economic growth, makes tax collection harder, and hence reduces her economic rent. It also encourages citizens' non-compliance and increases the costs of governance. Cit-

izens and the dictator in authoritarian regimes thus all crave for better law and order, but the Western-style legal development faces a variety of political obstacles due to the dictator's unwillingness to "tie her own hands". Thus, the dictator must look for alternative solutions to deal with weak rule of law (Liu and Weingast 2017).

In the digital age, the development of big data, mass surveillance, and artificial intelligence provides authoritarian governments with new opportunities to improve law and order. Two prominent developments are the common-law infrastructure on e-commerce platforms and the civil-law-based social credit system. As for the former, Liu and Weingast (2017) argues that the dictator could delegate market-preserving legal infrastructure to the private sector, particularly large e-commerce platforms such as Taobao in China. Taobao has online rating systems to enforce contracts and use big-data analytics and manual review to identify suspicious frauds. But a core institutional innovation is the crowd-sourcing of dispute arbitration to an online panel of jurors randomly selected from a pool of nearly two million volunteer Taobao users. These independent jury-like panels lay the legal foundation for Taobao's market infrastructure to sustain a common, national market that the Chinese government was unable to provide.

Taobao's crowd-sourcing jury system mimics a common law system in which disputes between traders are resolved by *independent* juries. Yet, as Liu and Weingast (2017) point out, this institutional innovation merely applies to the traditional areas of private law—property, contracting, and torts—and to online e-commerce platforms only. This is because independent judiciaries from the common-law tradition would eventually challenge the authoritarian government had the system expanded to the areas of public law, especially administrative law and citizen rights. Thus, the authoritarian government must look for solutions beyond the common-law tradition to improve order in society. China's social credit system is created in a *civil-law tradition* with the help of big data and mass surveillance to enforce law and maintain social order.

Glaeser and Shleifer (2002)'s seminal study on legal origin distinguishes between the

(English) common law system and the (French) civil law system by *independent* juries versus *sovereign-controlled* judges. As we shall discuss in more detail in the next section, China's social credit system has a strong civil-law tradition. The essence of the social credit system is to reward and punish citizens through publicly disclosed social scores that are largely evaluated by *government entities* based on citizens' economic, social, and political conduct. For example, local courts, banks, police departments, and various bureaus are in charge of evaluating most aspects of social scores, including, but not limited to, traffic violations, court judgment noncompliance, outstanding debts, firms' failing to pay wages, and even minor rule violations such as using expired tickets, smoking on a train, and jaywalking. These state entities are essentially "social-score judges" similar to *sovereign-controlled* judges who collect evidence and make decisions in the civil law system. The government also decides what to include in social scores. In short, the SCSs, like civil law systems, rely on sovereign-controlled professional "judges", legal codes, and written records, but are powered by mass surveillance and big data technologies for collecting, integrating, and analyzing information from various sources on centralized digital platforms. It is fundamentally different from e-commerce platforms' online rating system as the latter are mainly based on user evaluations and jury judgements.[6]

If implemented fairly, the social credit system, like any other well-functioning civil law systems, should enhance social order. Indeed, cross-country evidence suggests that the French civil law system is relatively more concerned with social disorder whereas the English common law family focuses relatively more on preventing public abuse of power (La Porta, Lopez-de Silanes and Shleifer 2008). In dictatorships, "state control" may be desirable because it is better than the alternative of lawlessness. Thus, citizens' desire for social order due to weak rule of law in dictatorships is a source of support for the SCS. However, due to its civil-law tradition, the social credit system incurs a commitment problem: as the state becomes more powerful in enforcing social contracts through the SCS, it may also become more abusive

[6]Some local SCSs in China incorporate user-based e-commerce ratings into social scores, but most aspects of social scores are still based on citizens' conduct evaluated by state entities.

given the unconstrained power of the sovereign-controlled "social-score judges". Indeed, French civil law countries exhibit heavier regulation, weaker property rights protection, and less political freedom than do the common law countries (La Porta et al. 1999). Lacking independent "social-score" judges to adjudicate disputes involving government officials, the social credit system can be potentially abused for political repression. The following subsection highlights several special features of social scoring systems that may largely increase this risk.

2.2 Information Asymmetry and Support for the SCS

Political repression is the act of a state entity controlling a citizenry by force for political reasons (Davenport 2007). In authoritarian regimes, any coercive tool that is sufficiently powerful to enhance social order can also be used for political repression due to the government's unconstrained power (Tilly 1985). But repression does not come without costs. It may decrease regime legitimacy, reduce citizen cooperation, and cause anti-regime backlash (Aytaç, Schiumerini and Stokes 2018; Daxecker and Hess 2013). To mitigate these costs, dictators around the world often conceal or legitimize the use of repression against citizens. For example, the authoritarian governments framed the protest crackdowns of Rabiaa al-Adawiya Square in Egypt and Fergana Valley in Uzbekistan as counterterrorism to justify those bloody crackdowns (Edel and Josua 2018). In fact, citizens' lack of information concerning the repressive nature of coercive tools and actions is frequently exploited by dictators to garner public support for state repression. A social credit system has some intrinsic features that greatly impede citizens from knowing the repressive potential of the system, which contribute to public support for the system.

First, a social scoring system combines information collection and individualized punishment that allow the state to conduct invisible, targeted repression against individuals. To generate a social score for each citizen, the system often obtains tremendously detailed information from a variety of sources such as banks, courts, police departments, transporta-

tion bureaus, communities, commercial firms, and even social media platforms. The detailed information allows the government to identify regime opponents for targeted repression (Xu 2020). In addition, the punishments associated with low credits include ban on air and high speed rail travel or stays in luxury hotels, lost access to government subsidies, inability to get hired for government jobs, and even ban on one's children's access to good schools. These punishments help the government efficiently tailor targeted repression for each dissident. As discussed in the next section, Chinese local government frequently use the SCS to restrict the movement and actions of dissidents and political activists. Thus, unlike overt, indiscriminate repression against a large population that often provokes anti-regime sentiments, the individualized, targeted repression facilitated by the SCS can be easily hidden from the public. It is this invisibility that makes the detection of the SCS's repressive potential particularly difficult.

Second, information control in authoritarian regimes could further exacerbate citizens' information problem. Nearly all dictatorships engage in some sorts of information control. A great number of authoritarian regimes censor online and offline expression (Gunitsky 2015); information that could stimulate collective action, including targeted repression against opposition leaders, is often singled out for censorship (King, Pan and Roberts 2013). With the implementation of the SCS, it is very likely that the government will censor information related to targeted repression under the SCS. In addition, dictatorships often employ propaganda to influence political discourse and public opinion (King, Pan and Roberts 2017). It is natural for the government to frame the "social credit" system as a tool for social order maintenance instead of political control. As scholars show, the framing of information significantly alters people's beliefs (Entman 1993; Chong and Druckman 2007) because individuals often base their opinions on available and accessible considerations without conscious deliberation (Tversky and Kahneman 1973; Higgins 1996). Thus, government information control will make citizens even more uninformative about the repressive potential of the SCS.

Third, a social credit system encourages people to isolate discredited individuals regard-

less of what exact they have done. This is because a social rating system lumps citizens' dissenting acts and other behavior together under a unified score of social credibility (as most SCS pilot programs in China do). Under the SCS, everyone has a single credit and this credit is common knowledge. When encountering a low-credit citizen, people tend not to question whether her score was reduced for her dissenting acts against the government or something else. Instead, they often hesitate to interact with this person because low "social credits" signal untrustworthiness. This phenomenon is common on eBay, where users avoid low-score traders without looking at their user reviews carefully, especially when there are better-scored traders who offer similar products at similar prices. Like eBay's user ratings, social credit scores will likely lead to similar avoidance since people can easily find alternative partners in most occasions of social interactions. In China, discredited citizens are blacklisted on government websites and are even publicized on billboards at bus stops for public shaming and social sanction.[7] The social isolation of discredited individuals further reduces the chance of revealing targeted repression.

The above features of the SCS have important implications about public opinion toward the SCS. Citizen may support a coercive tool such as the SCS when it helps maintain social order but disapprove of it when it enhances the regime's political control. Whether citizens support the coercive tool depends on its social benefits against potential political costs. However, studies of public opinion have long questioned citizens' competence in understanding complicated political discourse due to limited information available to them (Converse 1964). Citizens' attitudes toward a particular coercive tool are actually based on their "perceived" benefits and costs, which is subject to information asymmetry and manipulation. Following Chong and Druckman (2007), we can use a conventional expectancy value model to understand the formation of citizens' attitude toward the social credit system. Specifically, $Attitude_{SCS} = v_s w_s - v_p w_p$, where v_s is the evaluation of the SCS's social benefits, v_p is the evaluation of the political risk associated with the SCS, and w_s and w_p are the salience

[7] See, for example, http://www.xinhuanet.com/gongyi/2018-07/23/c_129918749.htm.

weights ($w_s + w_p = 1$) associated with social benefits and political risk respectively.[8]

Our key argument is that the salience weight w_p associated with the political risk of the SCS is influenced by citizens' information problem due to the secret nature of repression under the system and government information control. The above discussion suggests that citizens in authoritarian regimes are unlikely to uncover the repressive potential of the SCS because repression under the SCS is targeted and largely invisible, is concealed by government censorship and propaganda, and is further hidden because of citizens' avoidance of low-score peers. Placing little weight on the political risk of the SCS but a very large weight on its social benefits, citizens thus strongly support the SCS in China. This information argument has the following implications.

First, citizens' support for the SCS is likely due to the invisibility of targeted repression, which can be exacerbated by government information control. In dictatorships where repression is a crucial tool of social control (Svolik 2012), the government has strong incentive to frame state coercion in a positive way by emphasizing its role in social order maintenance. Thus, we expect the following hypothesis:

H1. Propaganda Hypothesis: Citizens are more likely to support the SCS when their information is obtained from state media outlets.

Second, citizens' information problem can be further worsened by their intention to isolate low-score individuals because people who tend to stay away from low-score individuals will have less chance to know the reasons behind their low social credits including those involving political repression. As they are less informed about the SCS's repressive potential, they will be more supportive of the SCS. This entails a positive association between tendency to isolate and support for the SCS.

H2. Social Isolation Hypothesis: Individuals' tendency to stay away from low-score peers is positively associated with their support for the SCS.

[8]It is possible that some individuals may dislike the social credit system when the system penalizes them for dishonest social behavior whereas some individuals may support the system when it is used for political repression that they deem desirable. Nevertheless, both occasions are exceptions and not the focus of this paper. Thus, we assume away negative social values and positive political values to explore the impact of information asymmetry on citizens' attitudes toward the SCS.

To sum up, citizens in authoritarian regimes are well aware of the social benefits of the SCS but unlikely to uncover state repression behind the system. This implies the following testable implication:

H3. Information Hypothesis: Providing information on the SCS's social-order-maintenance role does not further increase citizens' support, but revealing its repressive potential decreases citizens' support.

3 Social Credit Systems in China

The Chinese government has long realized the potential of social credit systems in steering citizen behavior. An early concept of the SCS emerged in 1991 as a government strategy to address problems in the financial sector (Liang et al. 2018). Later, several local governments initiated local SCSs to experiment with various credit systems. In 2014, the Planning Outline for the Construction of an Social Credit System was published by the State Council. This 2014 plan outlines a legal and regulatory framework for implementing a national SCS by 2020.

The functions of the social credit systems in China reach far beyond financial regulation.[9] After the publication of the 2014 Planning Outline, many local governments responded by devising pilot SCSs in their precincts. By 2018, 43 city governments had implemented SCS pilot programs (Figure 1). These government-run SCSs are intended to be mandatory for all citizens or targeted groups (Kostka and Antoine 2019). To steer the behavior of individuals, businesses, and organizations, local governments publish redlists to reward "trustworthy" behavior and blacklists to punish "untrustworthy" or illegal behavior. The criteria for "social credits" are based not just on the lawfulness, but also on the morality of citizens' actions, covering economic, social and *political* conduct (Creemers 2018). Potential punishment of the SCSs includes banning blacklisted individuals from flights and fast trains, throttling

[9]Several well-known commercial social credit systems (e.g., the Zhima Credit and Tencent Credit) were introduced by private firms to facilitate economic transactions following the China Central Bank's Notice on the Preparation of a Personal Credit Service.

their Internet speeds, banning them (or their children) from the best schools, stopping them from getting jobs, banning them from the best hotels, and/or publicly shaming them as bad citizens.

Figure 1: The Distribution of SCS Pilot Counties/Cities
Source: Chinese National Development and Reform Committee.
The map is made by the authors.

There is an ongoing debate concerning the motivations behind Chinese government's promotion of social credit systems. Much of the media coverage and scholarly work on the SCSs are negative, criticizing the government's political motives and calling the SCSs a sign of "digital dystopia" with a potential for totalitarian control. But some scholars tend to view the SCSs as the government's efforts in maintaining social order and building trust in society. Despite these competing views, scholars agree that Chinese society does have many trust issues, be it contract failures, unpaid debts, food safety scandals, pollution, corruption, or employers not paying their workers. The aforementioned 2014 plan has many parts that aim to construct government sincerity, commercial sincerity, social sincerity, and judicial credibility. If properly implemented, as suggested by Chorzempa, Triolo and Sacks

(2018), the plan will raise governance transparency, foster trust in the government and among citizens, as well as increase economic growth. From the plan and the early development of the SCSs, it looks like that the Chinese government indeed considered this system a tech-enabled solution to social problems caused by weak rule of law in China.

Although the current pilot SCSs are claimed to regulate financial and social behavior, political repression through the SCSs is particularly worrisome because most categories in social scoring are decided and evaluated by government entities with largely unconstrained power. Records of contract violations and unpaid debts come from local courts and banks (these entities are part of the government in China's political system). Investigations of food safety, drug safety, pollution, traffic violation, and employment disputes are the responsibilities of various local government bureaus. Journalists' and lawyers' behavior is judged by the police, courts, and probably propaganda departments. Petitioners' and protesters' records are also tracked by local police, street offices, and local bureaus of Letters and Calls. In addition, most SCSs are managed by local branches of the Political and Legal Affairs Commission—local governments' powerful coercive apparatus in charge of law enforcement and judicial systems. Moreover, most of these bureaus and departments are extralegal entities (except for courts). When violations are punished outside the legal system, there are no presumption of innocence, no judges, no legal representation, no due process, and often no appeal.

A snapshot of Zhenjiang Government's social credit blacklist show that all the cases are based on the judgements of government bureaus or other state entities.[10] Like sovereign-controlled judges in a civil-law system, these state entities have sufficient discretionary power to abuse the SCSs for repression. Observers of China's social credit systems have long expressed concerns over government abuse of the systems for various types of political repression (Hoffman 2017; Liang et al. 2018; Jiang and Fu 2018). Even had optimistic commentators such as Chorzempa, Triolo and Sacks (2018) warned that, "based on China's record of regu-

[10]See: http://cxyz.yangzhou.gov.cn/gjbslist.do?channelId=sxhb.

lating political speech and other activities, there is no doubt that it could also be abused for social control, prying into every aspect of Chinese citizens' lives and automatically punishing those who don't toe the party line."

In fact, after the launch of the 2014 plan, the Chinese government soon realized the SCSs' great potential for political control. It uses social credit systems to blacklist journalists and human rights lawyers who criticized the government (Wang 2017). Chinese local governments also use the SCSs to repress protesters and petitioners. There are records of blacklisted petitioners on some local social credit system websites.[11] Evidence suggests that repressing dissidents through SCSs is widely implemented among Chinese local governments as many of them incorporate petition rules into their social credit systems.[12] In those localities, petitioners who fail to follow local governments' "procedures" will be stripped of social credits or even downgraded. Violations of "procedures" include petitioning near the site of big meetings at the central or local government level, pleading one's case in "sensitive areas" in Beijing, "making trouble" on the Internet, and getting contacted with foreign media, etc. Some local governments further include "Falungong", a religious practice that has long been repressed by the Chinese government, into the punishment scheme of their social credit systems.[13] As the SCSs are getting implemented widely in China, evidence of political repression under the SCSs is paramount.

To many observers' surprise, the SCSs enjoy a high level of domestic support in China. Opinion surveys find that almost 80% of respondents either somewhat approve or strongly approve SCSs (Kostka 2019). Scholars attribute this high level of support to the lack of

[11]For example, Yangzhou Government initially listed several petitioners on its social credit website, see http://cxyz.yangzhou.gov.cn/detail.do?contentId=ffcdee870364484fafb5e13951cbea54&channelId=sxhb, which can be found through Google Search but were removed from the index of the government's online blacklist for some unknown reasons.

[12]See, for example, the Rule for Managing Seriously Untrustworthy Petitioners through Social Credit issued by Zhenjiang Government at the link: http://www.zjna.gov.cn/ycapp/nrglIndex.action?catalogID=4028d0dd4b4904ee014b529e75de02ae&type=2&messageID=297edff865b20bb20165b2fa1cb50054. Also see a similar rule in Rongcheng City from a news report (Gan 2019).

[13]See Rongcheng Municipal Measures on the Management of Members of Society's Credit Points and Credit Assessments for an example at the following link: https://www.chinalawtranslate.com/en/rongeng-society-members-credit-scoring-and-credit-appraisal-management-measures/.

social trust in China: 76 percent of respondents indicated that a general lack of trust in Chinese society was problematic (Kostka 2019). Indeed, Chinese citizens likely see social credit systems as a helpful tool to increase trustworthiness in society. Yet, an overlooked fact is that they know little about the repressive potential of the SCSs. The following sections provide quantitative evidence on how this information asymmetry influences public opinion toward the SCSs in China.

4 Information and Support for the SCS: Survey Evidence

We use two strategies to examine how information asymmetry influences citizens' support for the SCS. In this section, we explore the relationships between informational factors and public opinion of the SCS using a nationwide survey of over 2,000 Chinese netizens and a field survey of over 750 students in three regions of China. In the next section, we further use an in-the-field survey experiment to examine how framing and information revelation causally affect individuals' attitudes towards the SCS.

4.1 Online and field Surveys

The two surveys test the propaganda hypothesis (H1) and the social isolation hypothesis (H2). The information hypothesis (H3) will be tested with a survey experiment in the next section.

Nationwide Online Survey

We conducted a nationwide online survey between February and April 2018 through a Berlin-based survey company. The survey company collaborates with Chinese companies that operate websites and apps to conduct the survey online through desktops and mobile applications. The participants were randomly selected from a user base of more than 350,000 Chinese netizens who use over 40,000 different apps and mobile websites, such as Line (a messaging app with 220 million active users worldwide), Design Home (an app to simulate

home decoration), Coin Dozer (a gaming app), and TVSmiles (an app for quizzes and prizes to win). The survey was displayed on app offer walls or website pages that provide users a list of actions or opportunities to complete to get rewards. Depending on the apps and websites, users were offered different, small monetary or nonmonetary rewards, including access to premium content (e.g., news articles), virtual rewards (e.g., extra time in games), gift cards, vouchers, charitable donations, and PayPal cash. Using such a variety of rewards allows the survey to reach a broad population with different preferences and demographic features.

The survey uses a blind opt-in recruitment strategy to enlarge the representativeness of the sample: users were offered to take part in a survey, but they did not know the topic of the survey before opting in. The questions are not sensitive at all in this survey because we want to reach a population as representative as possible. When the survey content is displayed, participants are notified that they can choose to drop from the survey at any time and completion of the survey constitutes a consent. In total, 64% of opt-in respondents completed the survey. Survey responses were considered invalid if respondents completed them in a very short period of time with several consecutive identical answers or inconsistent responses. After excluding invalid responses, we have a total sample of 2,028 Chinese netizens.

The sampling process accounted for the distributions of age, gender, and region of China's Internet-based population based on recent statistics from the International Data Base of the U.S. Census Bureau (2016), Pew Global Attitudes Survey (2015), and Statista (2016). Further, to represent the demographic characteristics of the census, a weight is created using age, gender, region, and demographic groups' Internet penetration based on the aforementioned surveys and censuses. Taking into account an estimate of the design effect based on the distribution of the weights, the overall margin of error for estimates is 2.22%.

Field Survey in Three Universities

In March 2019, we conduct field survey among students in three universities in East,

North, and West China. We choose three regions to broaden sample representativeness and choose students because they are the social group that is most active in civic engagement and political participation (Zhao 2004). In this survey, we ask slightly more sensitive questions regarding the repressive nature of the SCSs (but the level of sensitivity is within the range of government tolerance because we use information found on state media websites). Conducting the survey experiment on a potentially sensitive topic in the field circumvents censorship that may be present in China-based online survey platforms. It also helps create trust and cooperation from respondents. More importantly, since we plan to ask individuals' attitude toward the repression of *online* criticism, respondents answering surveys online may self-censor to avoid state surveillance. An anonymous field survey avoids this problem because respondents answer questions on paper questionnaires that do not record any identifiable information. Section A.1 in Online Appendix further addresses ethic concerns in detail.

The enumerators conducted the survey in dining halls and main roads between classroom buildings and residential halls. For a convenience sample, respondents were recruited in those areas to represent the student population better than in dormitories or classrooms because all students come to dining halls and main roads regardless of their major, gender, and year level. In addition, enumerators actively walked around all areas of the survey locations to increase sample representativeness.

Survey questionnaires require five to ten minutes to complete. Respondents were requested to complete the questionnaire independently to minimize potential spillover effects of the treatments. Each student received five Chinese Yuan (about 0.75 USD) as compensation for their time. The enumerators first asked students whether they were willing to participate in an *anonymous* survey, and, if they agreed, the enumerators then presented the five-Yuan compensation to them and gave them the questionnaires in the random order. Roughly 50% of the students approached by enumerators agreed to participate. This response rate is within the normal range for a field survey. In addition, most of non-respondents refused before the enumerators explained the survey topic to them – their unwillingness to

participate was thus not due to the content of the survey.[14] Thus, it is unlikely that the non-responses are related to potential outcomes that would bias our results.

4.2 Model Specification and Variables

We are interested in whether citizens' support for the SCS is influenced by state information control (H1) and their tendency to isolate low-score peers (H2). We fit the following OLS model with the two aforementioned survey datasets to explore these relationships:

$$Y_i = \alpha + \beta_1 \, info.control_i + \beta_2 \, isolate_i + X_i' \, \Psi + \epsilon_{is} \tag{1}$$

where Y indicates support for the SCS; $info.control_i$ indicates state information control; $isolate_i$ is individual i's tendency to isolate low-score peers; X_{ip}' is a set of individual controls including social distrust, age, gender, education, family income, political status, etc. We expect β_1, and β_2 to be positive and statistically significant.

Government information control is measured by whether an individual obtains information about the SCS from state media because state media is the most important channel through which the Chinese government conducts propaganda and thought work (Brady 2009). This question also partially captures government censorship because citizens who are exposed to censorship or conduct self-censorship are more likely to consume information from state media (Simonov and Rao 2018). In the online survey, we asked individuals from which information sources they knew about SCSs, such as TVs, newspapers, social media, commercials, etc. We code TVs and newspapers as a proxy for state media because most TV channels and newspapers in China are state-owned. In the field survey, we specifically ask whether respondents obtained information about SCSs from *state* media outlets, including *state* TV channels, newspapers, websites, and the public accounts of state media outlets on social media platforms.

In addition, if an individual stays away from low-credit peers, she will be less likely to question the reasons behind their low credits and hence less likely to know about the

[14]The reasons for nonresponses include "no time", "hungry and need to have lunch", "too busy", etc.

SCS's repressive potential. To measure respondents' tendency to isolate low-credit peers, we ask them the question: "Imagine a good friend of yours has a sudden drop in their social credit score. Would you start to think differently about him/her?" We did not directly ask whether they are willing to stay away from them because such wording would induce preference falsification. This question was only asked in the nationwide survey.

Several other factors could also influence support for the SCS. As discussed in Section 2.1, citizens' desire for law and order (due to weak rule of law in dictatorships) will increase their support for the SCS. An individual's desire for law and order is reflected by the extent to which she generally believes people are untrustworthy. In fact, the SCS was created as a solution to the lack of trustworthy and moral conduct resulted from rule violations by citizens and government entities (Creemers 2018). Thus, we include this important control variable in both surveys. In the nationwide survey, we asked respondents whether they agree or disagree with the statement that "there is an issue of mutual trust between citizens in China's society". In the field survey, we ask students more specifically about the violation of social contracts by the statement that "in society, people always take advantage of others and violate social rules when occasion serves". These different but related questions of social trust mitigates measurement errors caused by a single measure.

In addition, an individual may be more likely to support the SCS if he or she obeys social rules and contributes to social goods. Thus, we ask several questions to capture individuals' social conformity and social service in the field survey. Moreover, being a state employee or a communist party member may increase individuals' support for government policies. Thus, we control for these two variables. We also include individual controls such as age, education level, gender, income, and urban-rural status.

4.3 Results

Nationwide Online Survey

The theoretical discussion suggests that people's support for social credit systems is as-

sociated with government information control and their tendency to isolate low-score peers. Figure 2 provides initial evidence. We standardize all variables to make coefficients comparable. As predicted, government information control has a positive and statistically significant effect (0.07 standard deviations, see Figure 2) even after we control for a number of covariates. The magnitude is not very large, likely due to the measure we used in this online survey: we asked respondents where they obtained the information about *commercial* SCSs (e.g., Tencent or Sesame SCSs) instead of state-run SCSs. In the field survey, we then asked respondents' source of information regarding the *state-run* SCS and the effect becomes much stronger. Nevertheless, the statistical significance suggests that government information control is an important reason behind public support for the SCS in China.

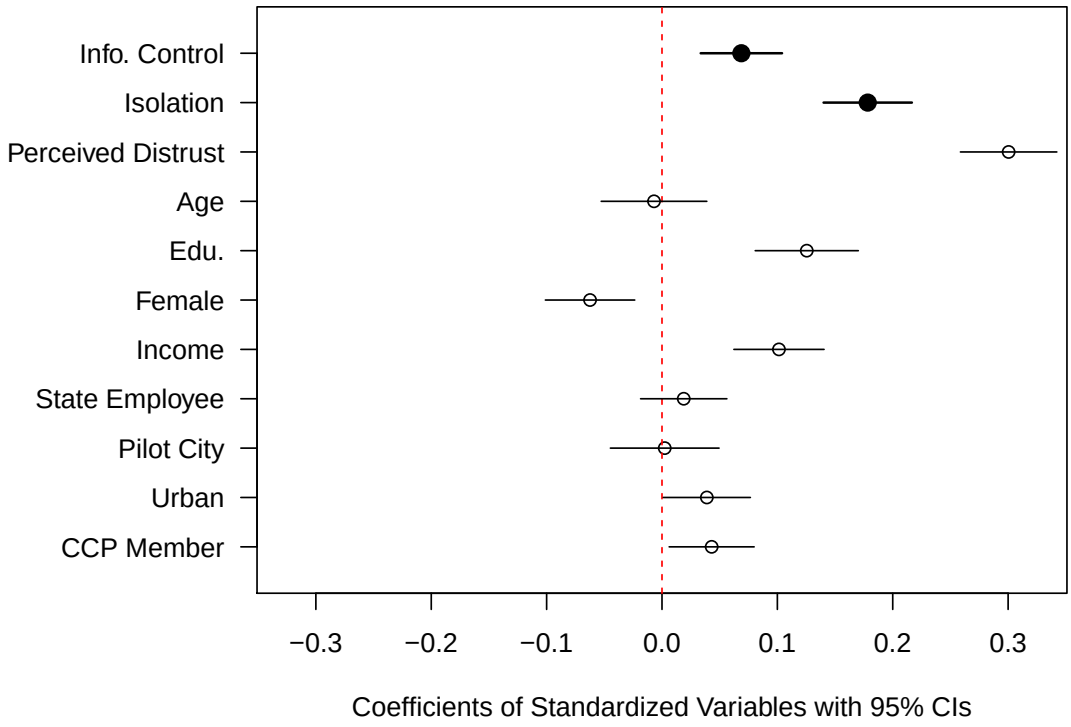

Figure 2: Sources of Support for SCSs: Nationwide Survey

Note: The number of observations is 1,948. Region fixed effects are included. Robust standard errors are clustered by provinces. A solid dot with a thick line indicates explanatory variables; an open dot with a thin line indicates control variables.

A more interesting finding is that a one standard deviation increase in social isolation

increases support for SCSs by 0.18 standard deviations and the effect is statistically significant (Figure 2). This is consistent with the argument that socially isolating low-credit peers makes individuals less informative about SCSs' repressive potential so that they will be more supportive of SCSs. Figure 3 plots this explanatory variable—individuals' attitudes toward good friends with a sudden drop in social scores. Among 2,028 respondents, merely 37.8 percent of them will not change their attitude whereas 62.1 percent of them will either think the friends differently or hesitate to hold a positive attitude. Obviously, social scoring has a large impact on social interactions. The evidence together implies that a lumped social rating likely encourages social isolation of discredited individuals, prevents people from knowing potential repression behind low scores, and hence increases public support for SCSs.

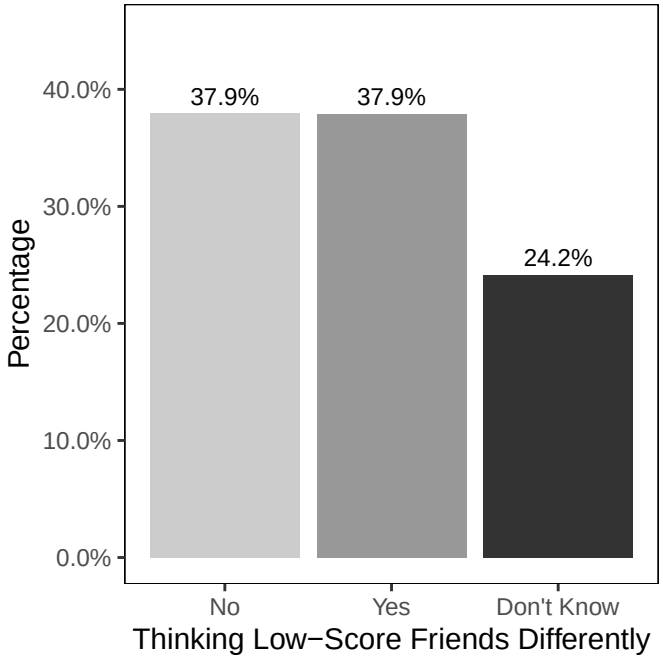

Figure 3: Attitude toward Low-Credit Friends

One concern is that more credulous individuals may be more likely to isolate low-score peers and support the SCS. In other words, it could be individuals' credulity rather than lack of information that leads to the relationship between tendency to isolate and support for the SCS. To capture credulity, we control for individuals' opinion about the fairness of

social credit scores because more credulous individuals will be more likely to consider social credit scores fair. We find that the relationship between tendency to isolate and support for the SCS remains strongly positive and statistically significant after controlling for perceived fairness (Column [2] in Online Appendix Table B.4).

Individuals' risk preference could be another confounder to the relationship between tendency to isolate and support for the SCS. Risk preference is the propensity to engage in behavior with the potential for loss or harm. Risk-averse individuals may be more willing to isolate low-score peers and, meanwhile, care more about safety and hence support the SCS. We address this concern by including a variable based on the question: "Have you ever decided to not use a website or app because you did not want to share personal information?". This privacy-related question captures individuals' propensity to take risks. We find that the effect of tendency to isolate does not change after including this control variable (Column [3] in Online Appendix Table B.4).

These robust findings are consistent with our argument regarding social isolation and hidden information. But we should interpret the result with caution since we do not know whether individuals who are *unwilling* to isolate low-score peers had indeed contacted with low-score peers or not [15].

It is also worthwhile to examine the relationship between social distrust and support for the SCS because the SCS is created to improve social trustworthiness. As expected, social distrust is positively associated with support for the SCS and the magnitude is large and statistically significant. In particular, a one standard deviation increase in perceived social distrust increases support for the SCS by 0.3 standard deviations. Note that this

[15]Empirically, there are three groups of individuals: a. those who are willing to isolate and therefore had no contact with low-credit individuals; b. those who are unwilling to isolate and had contact with low-credit individuals: they have more information on the repressive nature of SCS; and c. those who are unwilling to isolate, but had NO contact with low-credit individuals, therefore have no more information than individuals in group a. If the information mechanism works here, we would expect group a is more supportive than group b; but group a should be no different from group c. Our empirical test regarding the effect of willingness to isolate compares individuals in group b and c to those in group a. The existence of group c is therefore biased against us finding supportive evidence for the hypothesis. In other words, we would find even stronger effect if we could exclude group c.

measure captures individuals' *perceived* social distrust, which is also subject to government information manipulation and may lead to overestimation. Nevertheless, this result implies that citizens' support for the SCS is largely due to their desire for trustworthiness in society.

Field Survey in Universities

Evidence from the field survey is consistent with that from the online survey. Figure 4 shows that a one standard deviation increase in government information control increases support for the SCS by 0.22 standard deviations and the effect is statistically significant. This effect is stronger than that of the online survey probably because we mentioned the state-run SCS in the question as opposed to commercial SCSs. Beside, we specifically asked about whether they obtained information from *official media* instead of using TV and newspaper as a proxy for state media (as in the online survey). This strong positive effect provides further evidence consistent with the theoretical argument.

Individuals may support SCSs if they conform to social norms and contribute to public goods. But conformative and well-behaved individuals may be more likely to accept state propaganda. We control for these two variables to address this concern. Figure 4 shows that the main effect of government information control remains robust even if we control for social conformity and social service.

As mentioned above, social distrust is an important source of support for the SCS. In this field survey, we asked a more specific question about social distrust: to what extent respondents believe that people take advantage of each other and violate social rules. This question is more closely related to the SCS's role in social order maintenance. Figure 4 shows that the effect of social distrust is positive and statistically significant.

4.4 Robustness Check

Social desirability bias poses a particular challenge to the study of the SCS because it might be socially desirable to consume state media, sanction discredited peers, and, meanwhile, support the SCS. To mitigate the potential influence of social desirability bias, we

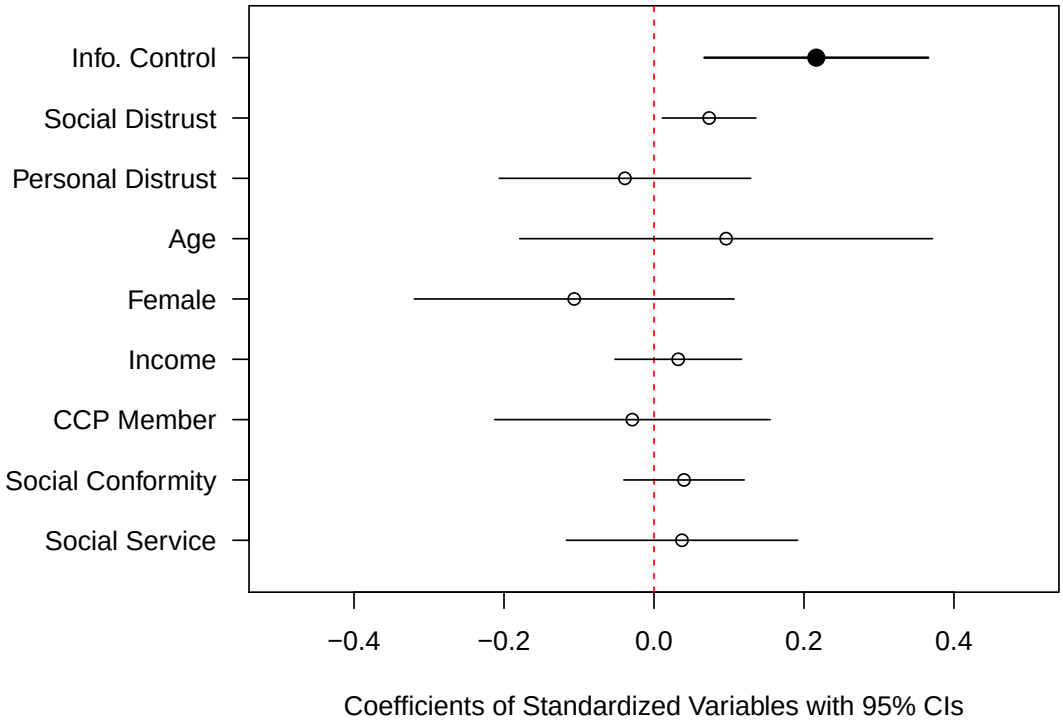

Figure 4: Sources of Support for SCSs: University Survey

Note: Number of observations is 664. University fixed effects are included. A solid dot with a thick line indicates explanatory variables; an open dot with a thin line indicates control variables.

control for respondents' self-scoring of social credits. The logic is that individuals with stronger social desirability bias will be more likely to rate themselves higher than the average. Thus, including this self-scoring variable can control for potential social desirability bias. Column (4) in Table B.4 and Column (2) in Table B.5 in Online Appendix show that our main findings are robust when self-reported social scores are controlled for.

Another concern is that the relationship between state media exposure and support for the SCS could be due to some unobserved personal traits. For example, obedient, insecurity, and risk-averse citizens are more likely to consume state media and support the SCS. In the field survey, we ask respondents how often they comment or repost political events or breaking news on the Internet. We control for this variable to account for individuals' risk

preference. Individuals' obedience can be measured by their willingness to petition an unfair policy proposed by the university authority. To capture insecurity, we asked respondents to what extent they believe others will take advantage of themselves when occasion serves. Table B.5 in Online Appendix shows that the effect of state media exposure is statistically significant even we control for these three variables.

5 Information and Support for the SCS: Experimental Evidence

A key argument of this paper is that the SCS can be easily abused for political repression but the targeted repression under the SCS is intrinsically secret, which makes it difficult for citizens to know the SCS's repressive potential. Thus, ignorant citizens tend to support the SCS because they only consider it as a tool for social order maintenance. This implies that framing the SCS as a tool of order maintenance in an experimental setting should not further increase citizens' support because the government have already done so in real life, but revealing its repressive potential should reduce its support (H3). We use a survey experiment embedded in the field survey to test this prediction.

5.1 Experimental Design

We employ a factorial design that randomly assign respondents into the control condition or one of the three treatment conditions, each with a different framing of the SCS. In treatment scenarios, respondents may receive information about the SCS's roles in social order maintenance (i.e., punishing a drunk driver), political repression (i.e., punishing a citizen who criticized the government), or both. In the control scenario, respondents receive no information about the role of the SCS. Note that if the levels of violations and associated punishment are different between the social order treatment and the political repression treatment, the treatment effects may not capture information revelation but reflect the differences in the levels of violation and punishment. To mitigate this concern, we fix the level

of punishment for both treatment conditions and make the levels of two rule violations as similar as possible. See Section A.2 in Online Appendix for more details about the treatment vignettes.

Table 1: Experimental Design for Attitude toward the SCS

	Group 1	Group 2	Group 3	Group 4
Assignment:	Control	Treated	Treated	Treated
Information Treatment:	No Info.	social Order Maintenance	Political Repression	Social & Political
N:	204	162	197	178

This factorial design (Table 1) allows us to utilize the entire sample of 752 respondents for statistical analysis. Specifically, we estimate the following equation:

$$Y_i = \alpha + \delta\, social_i + \pi\, political_i + \lambda\, social\,\&\, political_i + X_i'\,\Psi + \alpha_u + \epsilon_{iu} \tag{2}$$

where Y_i indicates individual i's support for the SCS; $social_i$ is the information treatment regarding social order maintenance; $political_i$ is the information treatment regarding political repression; $social.political_i$ is the treatment with both types of information; X_i' is a set of individual controls; and α_u indicates university fixed effects.

Due to the relatively small sample size, we use block random assignment to mitigate potential imbalances among groups. The easily identifiable variables that could predict public support of government coercion are gender and region (Conrad et al. 2018). Thus, we partition the subjects into 6 blocks (two gender groups by three regions/universities), and randomize within each block. Table B.3 shows that the randomization is successful and the four groups are well-balanced.

5.2 Experimental Findings

Total Effects

Our theory suggests that framing the SCS as a tool to maintain social order should not increase individuals' support for the SCS, whereas revealing information about its role in

political repression should decrease their support. Evidence from Figure 5 is consistent with this prediction. Note that the joint treatment in the factorial design is basically an interaction term so that the total effect of each single treatment should include the coefficient of the joint treatment. The upper panel of Figure 5 reports the point estimates of Model 2. The lower panel reports the total effects of the two main treatments. In particular, reminding respondents of the SCS's role in maintaining social order (e.g., punishing a drunk driver who a caused traffic accident) has little impact on their support for the SCS, but revealing information about the SCS's role in political control (e.g., punishing a citizen who criticized the government) largely reduces respondents' support for the SCS (by 0.16 SDs).[16]

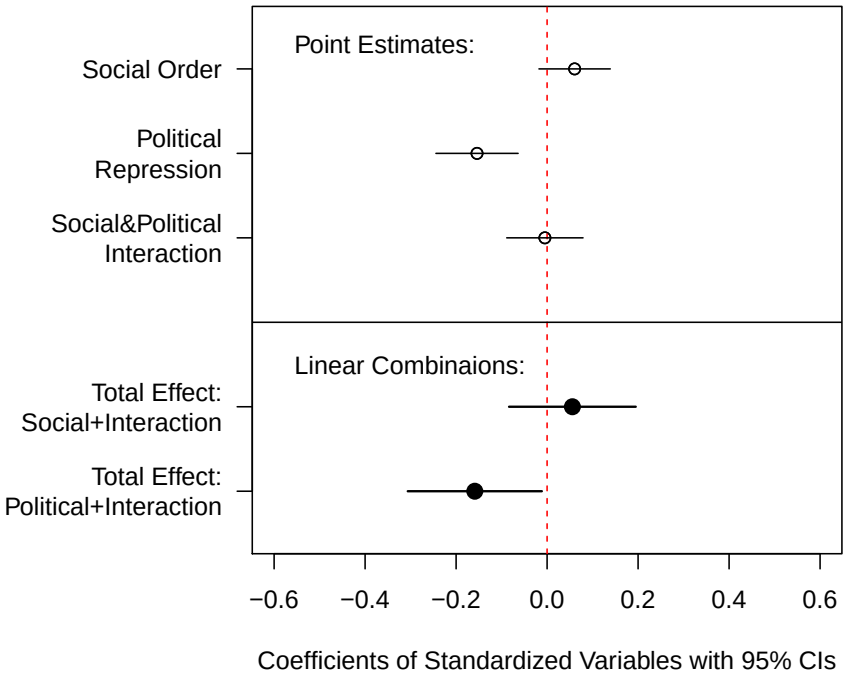

Figure 5: Information Treatment Effects: Full Sample

Figure 6 reports the marginal effects of repression information treatment conditional on the social order treatment using the original scales of the measures (i.e., non-standardized

[16]Note that the total effect of the repression information treatment reflects the fact that half of the respondents received the social-order information treatment, while the point estimate of repression information treatment indicates its effect on respondents who did not received the social-order information treatment.

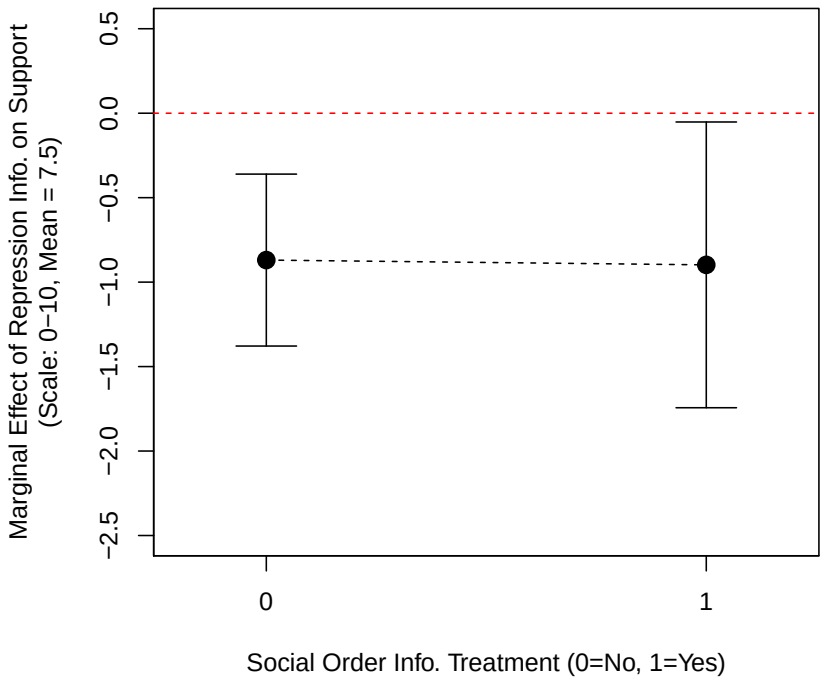

Figure 6: Marginal Effects of Repression Info. on Support for the SCS

measures). The results suggest that, regardless of the social order treatment, revealing information about repression reduces individuals' support for the SCS by around 12% and the effects are statistically significant. These findings imply that individuals are probably well-informed about the SCS's order maintenance function but largely lack information about its repressive potential.

The upper panel of Figure 5 also shows that the joint treatment of social order maintenance and political repression information has little impact. This means that the negative effect of repression information is not conditional on framing the SCS as a tool of social order maintenance or not (see also the flat slope in Figure 6). This is consistent with our expectation since citizens may have already known the SCS's social functions from various sources so that such framing will not make them more supportive.

Heterogeneous Effects by the Levels of Informativeness

We find a strong, negative effect of repression information revelation on individuals'

support for the SCS. To provide further evidence for the information mechanism we proposed, we examine the heterogeneous effects of information treatments among citizens who have different levels of information. If our information argument holds, this treatment will have a smaller effect on individuals who are better-informed about the SCS's repressive potential.

We use the sources where individuals obtain information about the SCS to construct a proxy for how informative they are. Individuals who obtain information from *only* state media outlets are considered less informative and categorized into the "less informative" sample, while all other individuals are considered more informative and categorized into the "more informative" sample. The reason is that Chinese state media rarely reports negative news concerning the SCS whereas other information sources such as social media and non-state media outlets are more likely to reveal the SCS's repressive potential. Thus, if an individual only obtains information from state media, her knowledge about the SCS's repressive potential will be very limited.

We identify 178 less-informative respondents and 547 more-informative respondents and then estimate Equation (2) on these two samples respectively. The lower panel of Figure 7 shows that the repression information treatment has a negative and statistically significant *total effect* on individuals' support for repression in the less-informative sample. In contrast, the total effect of this treatment among more informative respondents is much smaller and statistically insignificant. These heterogeneous effects suggest that the repression information poses a greater shock to less-informative respondents, which provide further evidence for our information argument.

5.3 Discussion

One may be concerned that the negative impact of the repression information on support for the SCS is because citizens simply dislike repression rather than lack information about the SCS's repressive potential. Another concern is that our repression information treatment is too strong to reflect the real-world "dosage" of repression through the SCS, so that the

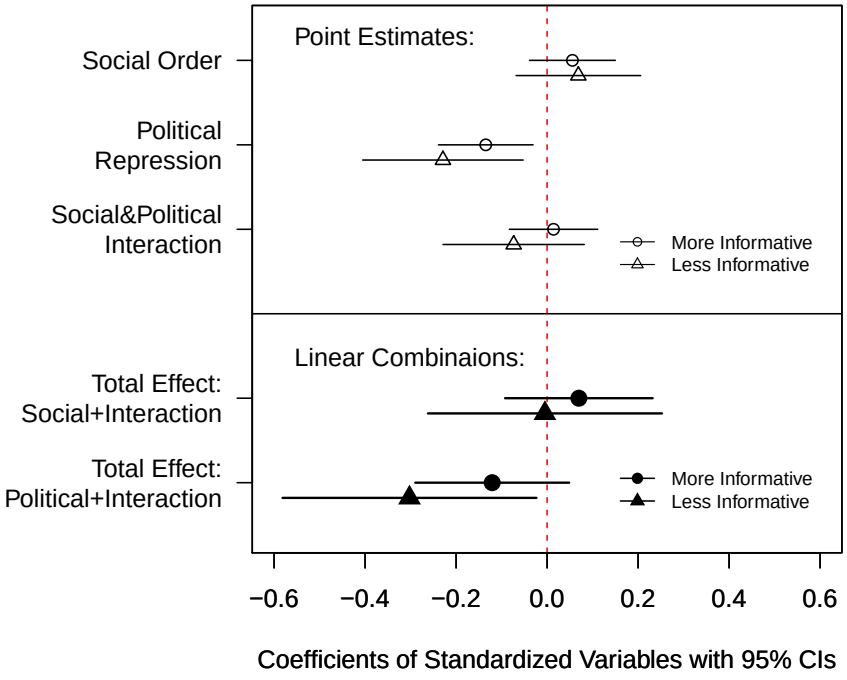

Figure 7: Information Treatment Effects, By Information Sources

treatment effect is not caused by lack of information but our unrealistic framing. However, if citizens' distaste for repression or the unrealistic framing were the only reason, we would not expect the repression information treatment to have different impacts on individuals with different levels of information. As shown above, the repression information has a larger effect on less informative individuals (Figure 7). This finding suggests that citizens indeed have limited information, though other mechanisms might also play a role here.

We further control for a number of other variables that could influence citizens' support for digital surveillance. As shown in Table B.6 in Online Appendix, the results remain robust after controlling for social distrust, self-reported social rule violations, family income, gender, age, and party membership.

6 Conclusion

The explosion of data in the new century have dramatically shaped people's economic and social life. Yet, it also opens new doors for governments to exercise political control. China's social credit system is such a new development that could tremendously affect citizens' social and political behavior. Despite that the SCS was created to enforce law and maintain order, it could be abused for political repression given its civil-law tradition and the unconstrained power of score-evaluating entities. This paper argues that public support for the SCS is partly due to citizens' lack of information concerning the SCS's repressive potential. This information problem is exacerbated by invisible, targeted repression under the SCS, government information control, and citizens' isolation of discredited peers. We conduct two original surveys to show that citizens' exposure to state media and changing attitude toward discredited friends are positively associated with their support for the SCS. A survey experiment further finds that respondents are not more supportive of the SCS when receiving information about its order-maintenance role but become much less supportive when knowing the SCS's function in targeted repression. These findings are consistent with our argument about the informational cause of support for the SCS.

The theory and findings have several important implications. First, the secret nature of repression under the SCS is attractive to repressive apparatus who may use the SCS for political repression. Second, the finding that citizens know much about the SCS's social-order-maintenance role but little about its repressive function implies that digital surveillance can be easily disguised to garner public support. Third, the strong effect of exposure to state media on support for the SCS suggests that government agenda setting can substantially influence public opinion about state coercion. Fourth, the relationship between social distrust and support for the SCS implies that the government can exploit citizens' demand for law and order to enhance its control over society, particularly in dictatorships where law and order are inherently weak.

Though it is not our main focus, this paper discusses the SCS's civil-law tradition as

opposed to Taobao juries' common law tradition. We mentioned that social scores in state-run SCSs are evaluated by state entities whereas scores on e-commerce platforms rely on the judgements of users and independent juries. As the Chinese government claims that the SCS was created to promote law abidance and trustworthiness in society, it would be interesting to examine whether the SCS is substitutable or complementary to the legal infrastructure provided by e-commerce platforms. In addition, an important argument in this paper is that socially isolating discredited individuals make targeted repression even more secret because the system mixes individuals' political acts with other behaviors to construct a single social score. We provides initial evidence that citizens are more supportive of the SCS when they change attitude toward discredited friends. But we acknowledge that this relationship is not causal and could be biased by potential confounders, particularly some unobserved personal traits. It would be interesting to explore this relationship with experiments. Future research on these directions are worth exploring.

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Online Appendix

Information Asymmetry and Public Support for Social Credit Systems in China

Xun Cao, Genia Kostka, & Xu Xu

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A Survey and Experimental Design

A.1 Ethical Considerations

We take extra cautions to minimize any potential risks on respondents, field staff, and the researchers. Both online and field surveys are anonymous. In the online survey, we made the questions as non-sensitive as possible to protect respondents and to mitigate self-censorship. The field survey is a five-minute opinion survey with minimal risk, which is granted an IRB exemption.[1] In particular, we take the following efforts to protect the rights and wellbeing of research participants and field staff in the field survey.

First, for the political repression scenario, we use the information available on state media website.[2] In fact, there were debates about whether the SCS should be implemented nationwide, and any netizens in China could find the information on the Internet about the SCS's role in political control if they want. Thus, the information revealed by our survey is tolerable by Chinese government. Second, we state earlier in the questionnaire that scenarios are hypothetical, which mitigates the potential risk of information revelation even if the information might change some students' belief. Third, we interviewed some of the respondents (for evaluating the questionnaire design) and they were not scared of the revealed information. During the recruitment and survey procedures, no student refused participation because of the content of the questionnaire. Fourth, we use an online criticism of the government instead of other political actions because online criticism is less sensitive and safer for respondents, field staff, and the researcher. Fifth, in each university, we consulted with several faculty members and students to proofread the questionnaire to ensure it did not incur any risk to respondents. Finally, the survey is anonymous and the enumerators were requested to stay away when respondents answered questions. A questionnaire that does *not* collect personal information reduces the risk of a loss of confidentiality and any other risks related to identity. These strategies not only reduce potential risks to respondents, but also minimize

[1] The exemption is granted by the Institutional Review Board (IRB) at Penn State University.

[2] See, for example, Credit Rating Should not Harm Citizens' Basical Rights (in Chinese): http://www.bjnews.com.cn/opinion/2014/06/20/321658.html.

respondents' social desirability bias and self-censorship in answering questions.

A.2 Experimental Treatments and Measures

Respondents were randomly assigned into on control group and three treatment groups. Table 2 shows vignettes for the control and treatment scenarios.

Table A.1: Control and Treatment Scenarios

Control Scenario: No Information

Many public spaces are equipped with facial recolonization and ID scanning; there are also surveillance cameras everywhere. It is very easy to record citizens' behaviors. In addition, a number of city governments are piloting Social Credit Systems that assess citizens' "creditworthiness". The SCS score can influence citizens' transportation options, school entrance, employment, social security status, and bank mortgage application, etc. Do you approve or disapprove this trend of management?

Treatment 1: Social Order Maintenance

... application, etc. *Recently, one citizen in an eastern city drove drunk and caused chain-reaction accidents (although no one was hurt).*[a] *Being downgraded in social credit, this person is stopped from buying air tickets or hopping on high-speed trains. Now this person can only travel by bus or slow train.* Do you approve...

[a] We use the case in an *eastern* city because East China is known for its repid development of social credit systems.

Treatment 2: Political Repression

... application, etc. *Recently, one citizen in an eastern city often posted criticisms online to blemish the government's image. Being downgraded in social credit, this person is stopped from buying air tickets or hopping on high-speed trains. Now this person can only travel by bus or slow train.* Do you approve...

Treatment 3: Social and Political Interaction

... application, etc. *Recently, one citizen in an eastern city drove drunk and caused chain-reaction accidents (although no one was hurt). Another citizen in an eastern city often posted criticisms online to blemish the government's image. Being downgraded in social credit, these two persons are stopped from buying air tickets or hopping on high-speed trains. Now they can only travel by bus or slow train.* Do you approve...

To measure respondents' opinion towards the SCS, we ask them to what extent they support the SCS on a 0 to 10 scale, and whether the government or third party credit organizations should manage the SCS. We also include a question that asks where respondents obtained information

about the SCSs, such as state media, non-state media, commercials, self-experience, and/or friends. This question allows us to examine whether state propaganda can increase public support of the SCS. In addition, as scholars argue that the public may support a coercive tool if they are not victims but beneficiaries of state coercion, we further ask respondents to guess their future social credit levels if a nationwide SCS were about to take place.

A.3 Summary Statistics

Table A.2 reports the summary statistics of the selected variables in the nationwide online survey.

Table A.2: Summary Statistics (Nationwide Survey)

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Credit Systems Approval	2,027	4.29	0.81	1	4	5	5
Social Distrust	2,027	4.16	0.92	1	4	5	5
Tendency to Isolate	2,028	0.38	0.49	0	0	1	1
Info. Control	2,028	0.68	0.47	0	0	1	1
Info. Cntl. (TV/Newspaper)	2,028	0.17	0.37	0	0	0	1
Female	2,028	0.42	0.49	0	0	1	1
Age	2,028	30.63	8.91	18	24	36	64
Income	2,027	7.72	2.74	1	6	10	11
CCP Member	2,027	0.22	0.42	0	0	0	1
Public Employment	2,028	0.33	0.47	0	0	1	1
Living in Pilot City	2,003	0.46	0.50	0	0	1	1
Credit Decision Influence	2,027	0.74	0.44	0	0	1	1
Government Confidence	2,027	3.30	0.74	1	3	4	4
Credit Score Fairness	1,224	3.33	0.60	1	3	4	4
Education	1,978	3.64	0.69	1	4	4	4
Urban/Rural	2,028	0.84	0.37	0	1	1	1
Privacy	2,027	1.61	0.59	1	1	2	3

With respect to the field survey experiment, Table A.3 reports the covariate balance across control and treatment groups on a number of background questions, including age, gender, family income, income satisfaction, party affiliation, membership in official university organizations, membership in student societies, community service, interest in discussing politics, media usage, social distrust, online expression. As shown in Table A.3, randomization is successful and the treatment is balanced across all these covariates.

Table A.3: Balance Check (Field Survey)

	obs.	Control	Social	Political	Social&Political	p-value
Age	685	21.45	21.46	21.00	21.15	0.215
Female (F=1)	722	0.51	0.49	0.55	0.47	0.466
Income (1-9)	718	6.84	6.59	6.80	6.84	0.447
Income Sat. (0-10)	727	6.72	6.71	6.74	7.03	0.515
Party (Yes=1)	727	0.16	0.16	0.17	0.13	0.670
Offical Org. (Yes=1)	728	0.48	0.44	0.51	0.46	0.638
Stud. Org. (Yes=1)	727	0.61	0.62	0.63	0.63	0.975
Commu. Serv. (1-5)	728	2.52	2.49	2.49	2.54	0.952
Speech (1-5)	726	3.15	3.13	3.17	3.14	0.963
Media: News (1-5)	714	2.04	2.10	2.14	2.11	0.681
Media: TV (1-5)	718	2.97	3.11	2.90	2.99	0.304
Media: Phone (1-5)	727	4.76	4.74	4.67	4.73	0.386
Distrust (0-10)	726	4.36	4.03	3.91	4.33	0.336
Diss. Politics (1-5)	726	2.28	2.17	2.23	2.16	0.598

B Empirical Results

B.1 Nationwide Online Survey

Table B.4 reports the results of the Nationwide Online Survey with additional controls. Column (1) shows the main regression results as plotted in Figure 2 in the main paper. In Column (2), we include the variable SCS Fairness to control for individuals' credulity. This question asks the users of Tencent or sesame SCSs: "Do you think your credit score is fairly calculated?". In Column (3), we use a question regarding privacy protection to capture individuals' risk preference, that is "Have you ever decided to not use a website or app because you didn't want to share personal information?". The results show that the effect of social isolation is large and statistically significant after controlling for these two variables. In Column (4), we control for individuals' social desirability by including a question that asks respondents to compare their scores with others: "Is your Sesame or Tencent score higher or lower than most of your family's and friends' scores?" The effect of Social Isolation remains large and statistically significant.

Note that the effect of information control is not very robust to the credulity and social desirability controls. As we discussed in the main paper, in the online survey, we only asked individuals from where they knew commercial SCSs such as Tencent and Sesame SCSs. We also used TV and newspaper as a proxy for state media. This imperfect measure likely correlates with individuals'

evaluation of the SCS's fairness and self-reported score comparisons. In the Field Survey, we used more accurate measure of exposure to state media and the result becomes very robust (Table B.5).

Table B.4: Information Asymmetry and Support for the SCS: Nationwide Survey

VARIABLES	(1) Support	(2) Support	(3) Support	(4) Support	(5) Support
Info. Control	0.069***	0.005	0.063***	0.025	0.006
	(0.017)	(0.016)	(0.018)	(0.017)	(0.017)
Isolation	0.178***	0.112***	0.181***	0.159***	0.111***
	(0.019)	(0.016)	(0.018)	(0.023)	(0.016)
Distrust in Society	0.300***	0.176***	0.306***	0.208***	0.183***
	(0.020)	(0.032)	(0.021)	(0.027)	(0.030)
SCS Fairness (Credulity)		0.216***			0.196***
		(0.017)			(0.020)
Privacy (Risk Preference)			0.068***		0.067**
			(0.022)		(0.026)
Selfscore (Social Desirability)				0.104***	0.063***
				(0.022)	(0.021)
Other Controls	Yes	Yes	Yes	Yes	Yes
Region FEs	Yes	Yes	Yes	Yes	Yes
Constant	0.008	0.183***	0.008	0.164***	0.187***
	(0.020)	(0.035)	(0.023)	(0.022)	(0.034)
Observations	1,948	1,197	1,948	1,292	1,131
R-squared	0.229	0.213	0.233	0.172	0.220

Robust standard errors are clustered on provinces. Other controls include age, education, gender, income, public employment, SCS pilot city, urban/rural status, CCP membership, etc.
*** p<0.01, ** p<0.05, * p<0.1

B.2 Field Survey

Table B.5 reports the results of the university field survey with additional controls. Column (1) shows the OLS results plotted in Figure 4 in the main paper. In Column (2), we control for self-reported score comparison to address social desirability bias. In particular, the question asks: "If the SCS will be implemented nationwide to rate every citizen, how do you estimate your own social credit score? A. Far above average ... E. Far below average." In Column (3), we use individuals' willingness to discuss politics online as a proxy for their risk preference. The question is "Do you usually discuss political affairs and trending news on the Internet (Weibo, WeChat, Blogs, etc.)? 1.Never ... 5.Very Frequently." In Column (4), we use individuals' willingness to petition an unfair

university policy to control for their tendency to obey authority. The results show that the positive relationship between exposure to state media (Info. Control) and support for the SCS remains robust after controlling for these personal traits.

Table B.5: Information Asymmetry and Support for the SCS: Field Survey

VARIABLES	(1) Support	(2) Support	(3) Support	(4) Support
Info. Control	0.218**	0.213**	0.219**	0.219**
	(0.035)	(0.026)	(0.030)	(0.026)
Social Distrust	0.073**	0.051***	0.052***	0.053***
	(0.014)	(0.001)	(0.001)	(0.002)
Personal Distrust (Insecurity)	-0.040	-0.029	-0.029	-0.029
	(0.039)	(0.040)	(0.041)	(0.042)
Selfscore (Social Desirability)		0.184*	0.182*	0.184*
		(0.050)	(0.050)	(0.049)
Discuss Politics (Risk Preference)			-0.041	-0.041
			(0.033)	(0.034)
Petition (Non-Obedience)				-0.019
				(0.044)
Other Controls	Yes	Yes	Yes	Yes
University FEs	Yes	Yes	Yes	Yes
Constant	-0.012	-0.022	-0.028	-0.027
	(0.041)	(0.034)	(0.031)	(0.031)
Observations	664	664	662	659
R-squared	0.073	0.102	0.105	0.105

Robust standard errors are clustered on provinces. Other controls include age, gender, income, CCP membership, Social Conformity, Social Service, etc.
*** p<0.01, ** p<0.05, * p<0.1

B.3 Field Survey Experiment

Table B.6 shows the results of the experiments with additional controls. In this table, we use the original scales of the variables instead of standardized values. The results show that the effect of repression information on respondents' support for the SCS is strong and statistically significant even we control for a variety of variables.

Table B.6: Information Revelation and Support for the SCS: Experimental Evidence

	(1) Full Sample	(2) State Info.	(3) Nonstate Info.	(4) Full Sample	(5) State Info.	(6) Nonstate Info.
VARIABLES	Support	Support	Support	Support	Support	Support
Social Order	0.389	0.438	0.354	0.330	0.181	0.361
	(0.239)	(0.414)	(0.288)	(0.238)	(0.400)	(0.295)
Political Repression	-0.880***	-1.293**	-0.773***	-0.859***	-1.361***	-0.784**
	(0.259)	(0.505)	(0.298)	(0.268)	(0.499)	(0.318)
Social & Political	-0.026	-0.429	0.088	-0.047	-0.386	0.044
	(0.247)	(0.458)	(0.286)	(0.256)	(0.458)	(0.308)
Info. Control				0.531***		
				(0.102)		
Social Distrust				0.192	0.230	0.192
				(0.117)	(0.215)	(0.138)
Personal Distrust				-0.128	-0.087	-0.140
				(0.122)	(0.219)	(0.145)
Age				0.086	0.026	0.115*
				(0.054)	(0.079)	(0.067)
Female				-0.520***	-0.906**	-0.310
				(0.182)	(0.352)	(0.221)
Income				0.057	-0.075	0.130**
				(0.053)	(0.092)	(0.064)
CCP Member				-0.170	-0.060	-0.384
				(0.312)	(0.509)	(0.367)
Social Conformity				0.094	-0.058	0.164
				(0.088)	(0.149)	(0.103)
Social Service				0.186	-0.479	0.553**
				(0.201)	(0.342)	(0.248)
University FEs	Yes	Yes	Yes	Yes	Yes	Yes
Constant	7.785***	7.937***	7.716***	5.196***	8.965***	3.302*
	(0.213)	(0.438)	(0.242)	(1.375)	(2.142)	(1.683)
Observations	731	179	552	664	158	506
R-squared	0.039	0.082	0.037	0.103	0.171	0.064
Total Effects (Linear Combinations):						
Social + Interaction	0.363	0.009	0.442	0.283	-0.205	0.405
	(0.419)	(0 .774)	(0 .488)	(0.424)	(0.751)	(0.516)
Political + Interaction	-0.907**	-1.722**	-0.685	-0.905**	-1.747**	-0.739
	(0.430)	(0.815)	(0.492)	(0.440)	(0.798)	(0.526)

Robust standard errors are in parentheses. Variable values are in their original scale. Column (1) and (4) report the results from the full sample. Column (2) and (5) report the results from a subsample of respondents who obtained information about the SCS from state media only (less informative group). Column (3) and (6) report the results from a subsample of respondents who obtained information about the SCS from non-state sources (more informative group).
*** p<0.01, ** p<0.05, * p<0.1