The Impact of Media Censorship: 1984 or Brave New World?

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Abstract

Media censorship is a hallmark of authoritarian regimes. We conduct a field experiment in China to measure the effects of providing citizens with access to an uncensored Internet. We track subjects' media consumption, beliefs regarding the media, economic beliefs, political attitudes, and behaviors over 18 months. We find four main results: *(i)* free access alone does not induce subjects to acquire politically sensitive information; *(ii)* temporary encouragement leads to a persistent increase in acquisition, indicating that demand is not permanently low; *(iii)* acquisition brings broad, substantial, and persistent changes to knowledge, beliefs, attitudes, and intended behaviors; and *(iv)* social transmission of information is statistically significant but small in magnitude. We calibrate a simple model to show that the combination of low demand for uncensored information and the moderate social transmission means China's censorship apparatus may remain robust to a large number of citizens receiving access to an uncensored Internet.

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> What Orwell feared were those who would ban books. What Huxley feared was that there would be no reason to ban a book, for there would be no one who would want to read one.
>
> Neil Postman, *Amusing Ourselves to Death*

1 Introduction

Media censorship is a hallmark of authoritarian regimes.[1] Countries such as China spend a tremendous amount of resources to block foreign websites so that uncensored, regime-threatening information is out of citizens' reach. Scholars have long suggested that censorship is key to the popular support and stability of these regimes (Ford, 1935). Nonetheless, direct empirical evidence about the effect of censorship is limited.

In this paper, we ask two questions. Does providing access to an uncensored Internet lead citizens to acquire politically sensitive information? Does the acquisition of politically sensitive information change citizens' beliefs, attitudes, and behaviors? Answers to these questions are far from clear. Citizens with access to uncensored Internet may not seek out politically sensitive information, due to lack of interest in politics, fear of government reprisal, and unawareness or distrust of foreign news outlets. Even if they do acquire such information and become fully informed, their attitudes and beliefs may not change.

We conduct a field experiment in China in order to answer these two questions. We randomly assign 1,800 university students in Beijing to either a control condition in which their Internet use is subject to *status quo* censorship, or to a treatment condition in which they are given tools to bypass Internet censorship for free for 18 months. A subset of the treated students also receive temporary encouragement for 4 months to visit Western news outlets otherwise blocked by China's censorship apparatus. We directly observe all browsing activities of foreign websites by the treated students. We also observe students' decisions to purchase access to uncensored Internet themselves after the experiment ends. Using surveys, we repeatedly measure a wide range of outcomes, including students' knowledge of current and historical events, beliefs and attitudes towards media, economic beliefs, political attitudes, and intended behaviors.

We find four main results. First, access to uncensored Internet alone has little impact on students' acquisition of politically sensitive information. Nearly half of the students do not use the tools to bypass censorship at all. Among those who do, almost none spend time browsing foreign news websites that are blocked. These numbers indicate that students' low demand for uncensored, politically sensitive information is an important reason why they do not consume such information, in spite of the low cost.

Second, modest and temporary incentives to visit Western news outlets lead to a persistent increase in students' acquisition of politically sensitive information. Students spend more time on foreign news websites even after the incentivized encouragement ends. This persistent increase suggests that demand is not inherently low. In particular, fear of government reprisal is unlikely the reason students do not demand sensitive information. Rather, an important factor shaping students' low demand appears to be their underestimation of the value of uncensored information. A period of exposure to foreign news outlets increases students' reported trust of these outlets, and makes them willing to pay a higher price for the access. The temporary intervention, by raising demand, has resulted in a lasting increase in students'

[1] Freedom House's *Freedom of the Press Report* shows that 86% of the world's population does not enjoy media free from censorship. In particular, states with "unfree" media are concentrated among regimes that are undemocratic and grant limited political rights for their citizens. Source: `freedomhouse.org/report/freedom-press/2016/china`, last accessed on December 11, 2016.

acquisition of uncensored information. By the end of the experiment, about 23% of the newly exposed students pay to continue their uncensored Internet access.[2]

Third, acquisition of politically sensitive information brings broad, substantial, and persistent changes to students' knowledge, beliefs, attitudes, and intended behaviors. Acquisition, as a result of free access and temporary incentives, makes students: *(i)* more knowledgeable of current events censored on domestic media, as well as politically sensitive events in the recent past; *(ii)* more pessimistic about Chinese economic growth and stock market performance in the near future, revealed in an incentive-compatible manner; *(iii)* more skeptical of the Chinese government, less satisfied with its performance, and more likely to demand changes in Chinese institutions; and *(iv)* more likely to plan on exiting through foreign graduate schools (albeit no change in direct engagement with the regime such as protesting), and more likely to report having pulled out investments in the Chinese stock market (among the small number of investors). If we rank students across all these dimensions, the access and encouragement combined have moved the median student from the 47th percentile of the distribution before the experiment to the 56th percentile by the end of the experiment.

Fourth, students who acquire politically sensitive information transmit some of their knowledge to their peers, but the magnitude of such spillovers is small. Exploiting the variation in treatment saturation across dorm rooms, we find that if a student actively browses foreign news websites and is informed of a sensitive news event, her roommate is on average 12.7 percentage points more likely to correctly answer a quiz on that same event. This rate implies that direct comparisons between treatment and control groups are not substantially downward biased. Moreover, a simple calibration exercise suggests that the social transmission is too moderate to qualitatively affect the knowledge level among the entire student population, given the proportion of students who have had access to uncensored information prior to our experiment. We speculate factors that dampen social transmission of politically sensitive knowledge in Section 5.2. We note, however, that our data only allows us to observe transmission among roommates, and hence can underestimate the overall social transmission of information.

Taken together, our findings suggest that censorship in China is effective not only because the regime makes it difficult to access sensitive information, but also because it fosters an environment in which citizens do not demand such information in the first place. Several limitations regarding the external validity and general equilibrium effects are worth stressing when one interprets our experimental results. In the final section of the paper, we take the partial equilibrium effects estimated from the experiment and calibrate a simple model to show that: *(i)* the share of students who have access to uncensored Internet prior to the experiment is too low for sensitive information to spread throughout the population; and *(ii)* the porous censorship apparatus would be robust even if the (unencouraged) access were provided to a substantially larger share of students. The robustness is driven by the low demand for, and the moderate social transmission of, uncensored information, even among the young and educated population. Importantly, we note that various general equilibrium effects that could undermine the robustness are held fixed given the relatively small scale of the experiment.

Our model simulation demonstrates that the censorship apparatus can also be fragile, precisely because its effectiveness depends on citizens' suppressed demand for uncensored information. Exposure to foreign

[2]Similar results are found regarding other unfamiliar but beneficial technology. For example, Dupas (2014) finds that a one-time subsidy on antimalarial bed nets has a positive impact on Kenyan villagers' willingness to pay a year later, which is predominately driven by villagers learning about the value of bed nets.

media can change citizens' beliefs regarding its value, and hence persistently raise their demand for uncensored information. If we were to provide encouragement at the level of this experiment to all students in addition to free access, enough students would begin to actively acquire sensitive information, so that the entire student population would become informed, taking into account the social transmission of information. These students could destabilize the censorship apparatus and impose substantial pressure on the regime to tighten its grip.

Our paper contributes to the large body of literature on the political economy of mass media. Our study adds an important data point to our understanding of how mass media influences citizens' political preferences and shapes aggregate outcomes.[3] We investigate the case of China, the largest country engaging in state-led information control, and we provide the first causal evidence via a field experiment to identify how Internet censorship shapes citizens' knowledge, economic beliefs, political attitudes, and behaviors. We show that state control of information is effective, making citizens more supportive of the regime. This relates to the broad literature on media capture (see Prat (2015), Enikolopov and Petrova (2015), and Strömberg (2015), among others). The extent to which a censored Internet affects citizens also complements our knowledge on the operation and underlying objectives of China's censorship apparatus.[4]

In particular, this paper relates to the strand of the literature on mass media that emphasizes the importance of demand-side factors (e.g. Mullainathan and Shleifer (2005), Gentzkow and Shapiro (2006); see Gentzkow, Shapiro, and Stone (2015) for a survey). In the domain of censorship, while many model censorship primarily as the government obstructing access to valuable information (see Guriev and Treisman (2015), Schedler (2009), and Shadmehr and Bernhardt (2015), among others), Gehlbach and Sonin (2014) build on the framework and endogenize citizens' media consumption. Our findings show that one cannot understand the impact of media censorship without taking into account of citizens' demand for uncensored information. Specifically, such demand is inelastic if citizens are uninformed about the extent of censorship, but demand becomes elastic once they have been exposed to uncensored outlets. This is consistent with Abramitzky and Sin (2014) who find that inflow of Western knowledge into Eastern Europe after 1989 reflected underlying demand differences across of these countries; Simonov and Rao (2018) who find that news demand responds to the bias in state-controlled media in Russia; Hobbs and Roberts (2018) who document the increased demand for censorship circumvention tools due to the sudden block of Instagram; and Roberts (2018) who shows that the Chinese censorship apparatus deploys frictions such as slowing down connections to achieve information control.

These findings also contribute to the growing empirical literature on the endogenous formation of beliefs and preferences when authoritarian regimes have a direct incentive to intervene. Among others, state indoctrination (Voigtlander and Voth, 2015; Cantoni et al., 2017) and historical experiences (Alesina and Fuchs-Schündeln, 2007; Fuchs-Schündeln and Schündeln, 2015; Chen and Yang, 2015) have been identified as generating lasting impacts on citizens' political attitudes. We show that censorship can effectively manip-

[3]For example, DellaVigna and Kaplan (2007) and Gerber, Karlan, and Bergan (2009) on the US; Yanagizawa-Drott (2014) on Rwanda Genocide; Adena et al. (2015) on Nazi Germany; and Enikolopov, Petrova, and Zhuravskaya (2011) on contemporary Russia. DellaVigna and Gentzkow (2010) review the empirical literature on persuasion across broader domains, and Prat and Strömberg (2009) provide a more recent survey of this literature, particularly in the domain of politics.

[4]King, Pan, and Roberts (2013, 2014) show that the censorship algorithm prioritizes to eliminate information related to collective actions. Lorentzen (2013) and Huang, Boranbay-Akan, and Huang (2016) argue that the Chinese government strategically allows a limited amount of sensitive information to flow on domestic social media in order to facilitate the central government addressing popular discontent more effectively. More recently, Qin, Strömberg, and Wu (2017) argue that social media content can be deployed to enhance state surveillance, effectively detecting and predicting offline protests.

ulate citizens' beliefs, attitudes, and preferences along the direction of the regimes' intentions. In particular, despite citizens' moderate level of awareness and sophistication regarding media censorship and the biases in censored information, they cannot fully debias themselves from the distorted information environment.[5]

In what follows, we provide a brief overview of Internet censorship in China in Section 2. In Section 3, we describe the experimental design, outcome variables of interest, and other empirical setups of the field experiment. In Section 4, we present results on whether providing access increases acquisition of sensitive information, and in Section 5, we present results on whether acquiring sensitive information affects knowledge, beliefs, attitudes, and behaviors. In Section 6, we simulate the counterfactual scenarios of media censorship in China. Finally, in Section 7, we discuss lessons from our experimental results and speculate on the external validity of this study on other authoritarian regimes that deploy Internet censorship.

2 Internet censorship in China

The media landscape in China is among the most regulated and restricted in the world, and China's media freedom is ranked consistently towards the bottom. In particular, China's information control over the Internet, primarily through censorship, is second to none in terms of its scale and technological sophistication.[6] In this section, we briefly describe the infrastructure of the Great Firewall that serves as the building block of censorship, and the market for tools to circumvent Internet censorship in China. We briefly outline the administrative and legal framework of Internet regulations in China in Appendix A.

2.1 The Great Firewall

Media outlets based domestically would incur severe business and political costs from publishing content that the state deems threatening and objectionable. As a result, content on domestic media is either routinely self-censored during the editorial process, or censored and filtered according to orders from the Propaganda Department of the Communist Party of China. Among the most heavily censored topics in 2016 are government corruption, media censorship, civil society activism, ethnic tensions, health and safety scandals (Cook and Cook, 2016). Transmission of politically sensitive information on domestic social media such as Weibo and WeChat is also limited due to platform-wide keyword filters and *ex-post* content deletion.

Since the Chinese government does not have the jurisdiction to directly control foreign media outlets, an important aspect of China's Internet regulation is its effort to block Internet users in China from accessing specific foreign websites. The Great Firewall, a major part of the umbrella *Golden Shield Project* directed by China's Ministry of Public Security, has operated since 2003 and serves as the main infrastructure blocking access to potentially unfavorable incoming data from foreign media outlets.

[5]Some recent studies investigate how people update beliefs based on censored information. In an abstract setting, Enke (2017) documents that people form biased beliefs by neglecting absence and non-occurrence, failing to take into account the selection underlying the data-generating process. In political contexts, Bai et al. (2015) show that Chinese citizens have difficulties interpreting information on air pollution when the government-controlled media conflicts with uncensored sources; and Huang and Yeh (2017) find that exposing Chinese citizens to selected news articles from foreign media that report on foreign societies may induce, in the short run, more favorable attitudes toward China.

[6]China is home to the world's most sophisticated Internet censorship apparatus. The Freedom House's *Freedom of the Net Report* in 2017 labels China's "Net Freedom Status" as *not free*, and rates its "Internet Freedom Score" as 87 (out of 100, where 100 indicates the most unfree) — the "world's worst abuser of Internet freedom." Source: `https://freedomhouse.org/report/freedom-net/2017/china`, last accessed on November 26, 2017.

The Great Firewall deploys several technologies to block entire websites or specific webpages from being accessed by IP addresses located in China. During the time frame of our field experiment, 12 of the 100 most trafficked websites in the world (and 161 of the Alexa top 1000 global websites) have been blocked by the Great Firewall. Some prominent examples are: Google, YouTube, Facebook, Twitter, Instagram, Blogspot, Tumblr, Dropbox, Blogger, Vimeo, Soundcloud, and Flickr. In particular, 9 of the top 20 news websites ranked by Alexa are blocked by the Great Firewall: for example, *CNN*, *The New York Times*, *The Guardian*, *BBC*, *Bloomberg*, *The Wall Street Journal*, and *Reuters*.[7]

Our project focuses on the blocked foreign news websites, a primary source of politically sensitive information and could potentially shape Chinese readers' knowledge, beliefs, and attitudes. In sharp contrast to their domestic counterparts, foreign news websites report politically sensitive news events and often feature uncensored investigative journalism on sensitive topics in China (Qin, Strömberg, and Wu, 2018).

2.2 Tools to bypass censorship

Access blockage introduced by the Great Firewall can be bypassed through proxy servers or traffic data encryption (e.g. the virtual proxy network, or VPN). This has led to a range of censorship circumvention tools and services to aid Internet users in China in gaining access to websites blocked by the Great Firewall.

There are more than a dozen tools for bypassing censorship available to Chinese Internet users. As of beginning of our field experiment, there was *no* law in China that explicitly regulates the use of VPN and similar services in China. In fact, as Roberts (2018) describes, "[b]ecause the government focuses control on gatekeepers of information, rather than individuals, from the perspective of an ordinary citizen in China the information control system poses very few explicit constraints." However, the enactment of the Cybersecurity Law in late 2016 indicates that the Chinese government may begin to take measures to regulate the VPN market in the near future.

The prices of censorship circumvention tools range from free of charge to US$ 25 per month — fairly inexpensive even from a college student's perspective. Faster and more stable tools typically charge a premium.[8] For example, the Chinese government *temporarily* shuts off the connection of some lower priced VPN services during periods such as the annual March meeting of the People's Congress. This suggests that while the government is technologically capable of thoroughly disrupting censorship circumvention tools, it chooses to neither do so during majority of the days in the year nor target all the tools, presumably because many businesses operating in China rely on these tools to ensure a global Internet connection.

Approximately 3% of Internet users in China regularly purchase tools to bypass censorship (Roberts et al., 2010).[9] As a result, all 10 of the top 10 most trafficked websites in China, as of 2017, are domestic, a much higher ratio compared to that in Hong Kong (4 out of 10), Taiwan (5 out of 10), and South Korea (3 out

[7] Information on website blockage is provided by `greatfire.org`, an organization that monitors the activities of the Great Firewall. The full Alexa ranking of global news websites can be found at `http://www.alexa.com/topsites/category/News`, last accessed on December 11, 2016. Not all foreign websites are blocked by the Great Firewall, and not all blockages start at the same time. For example, while Microsoft Bing services remain unblocked by the Great Firewall as of today, IP addresses located in China have been unable to access almost all Google services (including Google search, Gmail, Google Scholar, etc.) since 2011.

[8] "Circumvention Central," from `greatfire.org`, provides reviews of some popular tools. Similar reviews can be found in "Leap Over the Firewall: A Review of Censorship Circumvention Tools" published by *Freedom House*.

[9] The US Congressional Research Report "China, Internet Freedom, and U.S. Policy," published in 2012, estimates that the usage rate ranges from 1 to 8%. Source: `https://fas.org/sgp/crs/row/R42601.pdf`, last accessed on June 22, 2017. More recently, China Urban Governance Survey (2015) reports that approximately 5% of urban residents actively circumvent Internet censorship (Roberts, 2018). The total number of Internet users in China was estimated to be more than 721 million in 2016. Source: *Internet Live Stats*, `www.InternetLiveStats.com`, last accessed on December 11, 2016.

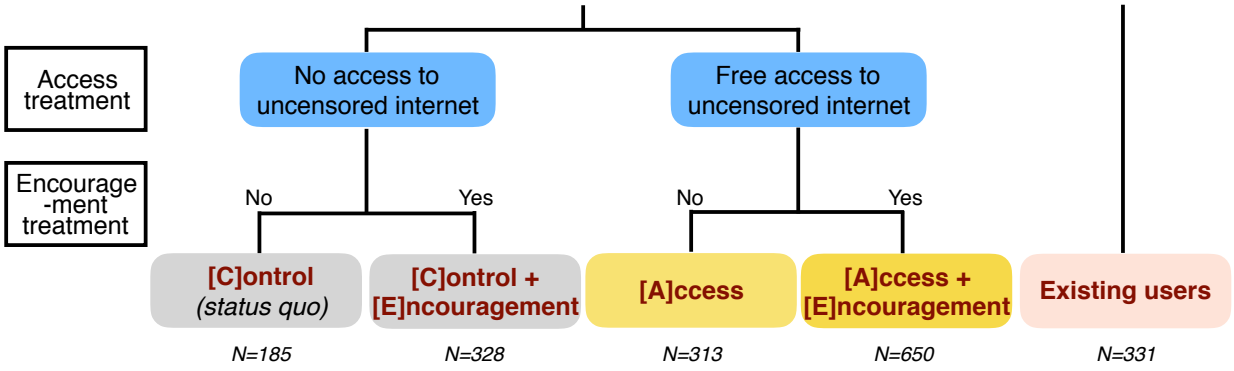
of 10).[10] The low usage of censorship circumvention tools, albeit their relatively inexpensive availability, provides *prima facie* support that citizens may not demand the access to uncensored Internet.

We may expect Chinese citizens to be afraid of using tools to bypass censorship and browsing politically sensitive information, regardless of the legal conditions. To the extent that evidence exists, it suggests that Chinese Internet users exhibit limited fear in browsing or posting sensitive content (Qin, Strömberg, and Wu, 2017). In fact, explicit censorship and salient actions to block information access can backfire — information consumption may actually increase, similar to the so-called "forbidden fruit effect" (Hobbs and Roberts, 2018). When a subgroup of students in our study recognized that *The Economist* magazine was blocked by the Great Firewall in April 2016 as a result of its coverage of top Chinese leaders' repressive policies, they spent significantly *more* time on *The Economist*. Importantly, to the extent that there is fear, this is be an important source of the low demand for sensitive information we test for in the experiment.

3 Experimental design

In Section 3.1, we describe our experimental treatments — providing free access to uncensored Internet and encouraging visits to foreign news outlets. We describe outcomes related to students' acquisition of uncensored content in Section 3.2, and those related to knowledge, economic beliefs, political attitudes, and intended behaviors in Section 3.3. Finally, in Section 3.4, we describe the logistics of the field experiment, discussing the timeline, recruitment, treatment assignment, panel surveys, and sample retention.

3.1 Access and encouragement treatments



The experimental design can be summarized in the above figure. Prior to treatment assignment, we identify in a baseline survey those students who have already purchased and are currently using tools to bypass censorship. We exclude these *existing users* in our subsequent treatment assignment, but we follow them throughout the study since they serve as useful benchmarks to interpret the treatment effects. For those who are not existing users of censorship circumvention tools, we randomly assign them to either a *control* condition in which they are subject to censorship as in the *status quo*, or an *access (A)* treatment in which they receive free access to uncensored Internet for 18 months. Among a random subgroup of the students who receive the access treatment, we also assign an *encouragement (E)* treatment, where we encourage them to visit foreign news websites blocked by the Great Firewall.

[10] Source: Alexa top websites by country, `http://www.alexa.com/topsites/countries`, last accessed on July 15, 2017.

To address concerns that the encouragement treatment alone generates an experimenter demand effect (e.g. explicit endorsement of specific foreign websites by the researchers) or changes students' perception of government suppression, we also provide the encouragement treatment to a random subgroup of students in the control group. These students are presented with the same encouragement treatment material, although they are not able to visit the blocked websites mentioned in the material.

Overall, our experiment creates 5 groups of students: *(i)* the control group students [C]; *(ii)* the control group students who are encouraged to visit foreign news websites [CE]; *(iii)* students who receive only the access treatment [A]; *(iv)* students who receive both the access and the encouragement treatment [AE]; and *(v)* the existing users.

3.1.1 Free access to uncensored Internet

The access treatment provides students with a free 18-month subscription to a censorship circumvention tool. The tool establishes a fast and stable connection to the Internet unrestricted by the Great Firewall, enabling students to access websites that are otherwise blocked. The tool does not affect connections to websites that are not blocked by the Great Firewall.

We choose one of the most premium censorship circumvention tools available in China, so that unfavorable features such as slow connection speed that may prevent students from using the tool are kept to a minimum. The tool requires less than 1 minute to set up, and students do *not* need to sign on each time they wish to browse uncensored Internet — the tool operates in each browsing session by default. The tool works on both computers and mobile devices. We provide a full list of the tool's features in Appendix B.1. An individual account costs US$ 25 per month. Although this does not exceed a typical college student's budget, almost all existing users chose cheaper censorship circumvention tools prior to our experiment.

The access treatment is distributed to assigned students in the form of a lottery after they complete the baseline survey. We inform treated students that this tool, while provided for free, is valued at US$ 25 per month and is a "professional and secure Internet service that allows [one] to browse Internet websites around the world without restrictions, access information in a speedy manner; and it is a service adopted by many business enterprises and professionals in China."[11] Treated students are given personal accounts for the tool, and they can activate the service and start the setup process right away, following detailed instructions on the service's website. We limit each account to simultaneously operate on a maximum of 2 devices in order to prevent multiple students from sharing one account. We, however, cannot rule out the possibility that students lend or sell the entire account to another student.

At the same time, we also randomly draw 100 students to win a one-year VIP-account of Youku (worth approximately US$ 30), a Chinese video streaming service similar to Netflix. This serves as a placebo and obfuscates the study's explicit focus on censorship circumvention tools.

[11] Students can learn more about the censorship circumvention tool itself and track their usage status on the service website. We intentionally keep the language introducing the tool vague to avoid political pressure from the school administration. Almost all participants in our study understand what censorship circumvention tools are and know what they are used for — according to our baseline survey, most of them have heard of the tools, or have people in their immediate social circle who have been using them. We communicate with study participants simultaneously, via email and WeChat (equivalent to WhatsApp) messages. In Appendix B.2, we present the translated email script in which we inform the treated students of the access treatment.

3.1.2 Temporary encouragement to visit foreign news outlets

In addition to access, we randomly provide temporary encouragement to visit foreign news outlets in order to examine students' demand for uncensored information. The encouragement consists of a variety of materials mimicking advertisement campaigns to promote foreign news outlets, and it is distributed in the format of bi-weekly "newsletters" to students' email and WeChat accounts. Students are told that we curate the content of these newsletters to help students stay informed.

We design two phases of the encouragement treatment, in order to distinguish whether demand for foreign news may be raised simply by informing students that foreign news outlets exist, or students need to actually consume content from these outlets. The first phase is purely informational. It consists of 4 newsletters introducing students to a variety of foreign websites that are blocked by the Great Firewall that students may have never heard of (e.g. the Chinese language edition of the *New York Times*). Moreover, it highlights that politically sensitive news events are often reported differently in domestic news outlets than in their foreign counterparts.

The second phase involves news quizzes with modest monetary rewards. These quizzes aim to encourage students to actually visit the Chinese edition of the *New York Times*, a website on which we focus exclusively to distill the impact of encouragement on students' foreign news consumption. We choose the *New York Times* Chinese edition because it provides extensive coverage on China-related news, offering politically sensitive content unavailable on the domestic media. The website represents one of the highest quality foreign news outlets in Chinese language that are blocked by the Great Firewall, and unlike its English counterpart, the Chinese edition does not impose a paywall. We design the quizzes such students can locate the answer within a couple of minutes if and only if they visit the front page of the *New York Times* Chinese edition. We implement 4 rounds of the quizzes, and students earn US$ 2.5 if they answer correctly in each round. We set the monetary incentives at a modest level, so that they are unlikely to overcome political fear — potentially a dominant factor that prevents students from browsing foreign news outlets.

The encouragement materials cover many news stories. For example, in one quiz, we ask students what percent of underground water is polluted as reported in an article on the *New York Times* Chinese edition front page. In addition to the underground water pollution, other topics covered in the quizzes include China's wealth inequality, censorship on key economic indicators, and labor unrest. In order to capture students' broad level of knowledge, we quiz students on both the news events explicitly covered in the encouragement materials, and those that are never mentioned. For instance, we measure students' knowledge of the Panama Papers episode, which is never covered in the encouragement treatment.

The encouragement to visit foreign news outlets started in December 2015, simultaneous with the distribution of the access treatment. There is no between-subjects randomization in the order we implement the two phases. Each phase of the encouragement lasts for 2 months, and we infer how students respond to each phase of the encouragement by changes in their behaviors over time. The temporary encouragement treatment ended in March 2016, 6 weeks prior to the midline survey.[12] Hence, there are two distinct periods during the experiment: *(i)* from December 2015 to March 2016, the encouragement treatment is in place and the value of visiting foreign news websites is boosted (especially during the second phase of encouragement); and *(ii)* from March 2016 until the end of the study in April 2017, the encouragement treatment

[12]We do not explicitly inform students that the last round of the incentivized quiz would be in mid-March. It is unlikely that students continue to regularly visit foreign news websites out of anticipation of future quizzes — they could always visit the *New York Times* to look for answers after they are presented with the specific quiz questions.

is no longer in place. Appendix C provides more details of the encouragement treatment, and Appendix Figure A.1, A.2, and A.3 present screenshots of the encouragement newsletters.

3.2 Outcomes: media

We measure the impact of uncensored Internet access on students' media consumption according to the following outcome categories.

Browsing foreign websites For students in the treatment group who have activated their censorship circumvention tool accounts, we directly observe all of their online activities that route towards websites hosted *outside* of China. We inform students that their online activities are logged as part of the censorship circumvention tool user agreement. Based on approximately 1.5 billion click-level activity logs recorded by the server, we construct the following 4 key outcome variables: *(i)* whether a student activates the tool; *(ii)* whether a student actively uses the service after activation; *(iii)* total time spent on browsing foreign websites each day once a student has activated the tool; and *(iv)* total time spent on each foreign website category, such as the Big 4 (Google, Facebook, YouTube, Twitter), news, entertainment, etc.[13]

We ensure study participants that the activities are recorded anonymously — rather than students' real identities, participants are only linked to their participant IDs. Approximately 77% (62%) of the study's male (female) participants use the censorship circumvention tool to browse pornography at least once — many pornographic websites are blocked by the Great Firewall. The prevalence of browsing pornography suggests that the perception of being monitored does not shy students away from content that may be considered socially undesirable.

Importantly, this measurement of information acquisition has two limitations. First, we do not observe the online activities of existing users of the censorship circumvention tools, students in the control group, or those treated students who do not activate the tool. In order to compare the exposure to foreign news websites across all study participants, we repeatedly ask all students to report the frequency with which they visit foreign websites to obtain information throughout the experiment (see Appendix D, Panel A for actual wording of these questions). Second, we do not observe browsing activities on websites hosted domestically, since the censorship circumvention tool need not reroute this online traffic. To assess whether the increased foreign news consumption affects time spent on its domestic counterparts, we ask students to rank the importance of various domestic and foreign media sources to their knowledge of news events.

Decisions to purchase access after experiment ends The free subscription to the censorship circumvention tool expires just before the endline survey, 18 months after the experiment starts. During the endline survey, we offer students who receive the access treatment an opportunity to renew their subscription (out of their own pockets) at a discounted price of US$ 4.50 per month. Interested students can subscribe to the service for a minimum of 3 months, and the service resumes immediately after they pay online. The

[13] We remove "passive" online activities such as those generated by automatic background refreshes, and we remove "inactive" browsing sessions where participants spend more than 30 minutes on a particular webpage without any additional activities. To categorize websites, we use the Alexa categorization of domain names, and we manually categorize domains that are not covered by the Alexa database. The category of top foreign news websites consists of top 20 news sites based on Alexa Top Websites rankings, excluding news portals, such as Google News. Source: `http://www.alexa.com/topsites/category/Top/News`, last accessed on January 8th, 2017.

average monthly price is set at the median level of treated students' elicited willingness to pay for the censorship circumvention tool at the time of the midline survey. In addition, using the same language we use to describe the access treatment, we introduce the censorship circumvention tool to students who have not received the access treatment and to the existing users of similar tools. We offer these students an opportunity to purchase the subscription at the same discounted price. We directly observe the subscription renewal decisions among treated students, and the new accounts created by the students in the control group and those who are existing users of similar tools. Finally, we ask all students to report whether they would purchase tools other than the one that we provide during the endline survey. This setup allows us to compare the access purchase and renewal behaviors across *all* study participants who completed the endline survey, regardless of their treatment status or whether they adopt the access tool we provide.

Beliefs and attitudes regarding media To assess the mechanisms behind the treatment effects on browsing foreign media outlets and acquiring uncensored information, we measure participants' attitudes and beliefs regarding media and censorship. Our questions cover: *(i)* valuation of the access to uncensored Internet and foreign news outlets (including a BDM-elicitation of willingness to pay); *(ii)* trust in domestic and foreign news outlets; *(iii)* belief in the actual media censorship level and its drivers; and *(iv)* justification for media censorship. In addition, both the baseline and midline surveys elicit students' calibration of reporting bias and censorship depending on the news events' nature.

3.3 Outcomes: knowledge, beliefs, attitudes, and behaviors

We examine the effects once students are exposed to politically sensitive information, on a comprehensive set of outcomes. We repeatedly measure 4 broad groups of outcomes in our panel survey (see Appendix D, Panels B-E, for detailed descriptions). These survey questions are elicited in a private manner, removing various social incentives (such as signaling, coordinating, conforming) that may affect students' answers.

First, we assess a range of knowledge from contemporary to historical and from politically sensitive to non-sensitive. For example, students are quizzed about current news events not covered in the encouragement newsletters, and are asked about their awareness of major political protests around the world. Second, we elicit students' economic beliefs in an incentive-compatible manner. Students are asked to guess, for example, China's GDP growth rate and its stock market performance by the end of 2017. They are rewarded with an additional bonus payment of up to US$ 3 if their guesses are sufficiently close to the true performance indicators published at the end of the year. Third, we measure a wide range of attitudes that students hold with respect to politics, broadly defined. For example, students are asked to report their trust in various institutions, and to evaluate the Chinese government's performance over the past year. Fourth, we ask students to self-report on a range of past behaviors and intended behaviors for the near future, such as their social interactions discussing political topics, political participation, investment in the Chinese stock market, and plans after graduation.

Whether foreign news exposure affects any or all of the 4 dimensions hinges on the nature of foreign news outlets. For example, do they convey information, sentiment, or both? In addition, which specific aspects of knowledge, beliefs, attitudes, and behaviors may be affected depend on the particular events that take place during the experiment.

Self-censorship in answering sensitive questions Students may not provide honest answers to survey questions on sensitive political attitudes.[14] Several facts suggest that self-censorship may not be a significant concern. First, more politically sensitive modules appear towards the latter half of the survey. We find that conditional on starting the survey and completing it through the politically non-sensitive module, less than 2% of the participants drop out upon seeing these sensitive questions.

Second, we use a modified "list experiment" (or "Item Count Technique") to explicitly measure participants' degree of self-censorship in expressing distrust towards China's central government.[15] The list experiment provides "cover" for expressing potentially sensitive and stigmatized attitudes (by removing individual level identification from each answer) and allows one to estimate the attitude's prevalence only at the population level. Hence, we are able to compare estimate of adherence to such attitude from our list experiment elicitation (among a random half of the study participants) to that based on the direct question (among the other random half of the study participants) about the same attitude, to determine whether any self-censorship exists (due to stigma, fear, or social desirability biases). When respondents are provided with "cover," we estimate that 69.7% of the participants indicate that they do *not* completely trust China's central government. When asked directly, 68.9% of the participants indicate such distrust. These two estimates are statistically indistinguishable from one another (p-value = 0.841), suggesting that the magnitude of self-censorship bias in this domain is small at the time of the baseline survey.

Concerns of multiple hypotheses testing Given the large number of survey outcomes we examine, the threat of multiple hypotheses testing and the possibility of false positives could be prominent. We do three things to address such concerns. First, we ask *every* outcome of interest elicited in the baseline survey in the subsequent midline survey. We ask a subset of questions in the endline survey, because of space constraints and the need for other experimental modules. We report the estimated treatment effects based on every question covered in the endline survey, and in Appendix E, we report treatment effects estimated from every question asked in the midline survey. Second, in order to reduce the number of hypotheses we test, we construct a z-score index variable for each category of outcomes we pre-registered to examine.[16] We standardize each component of the index and sum respondents' standardized outcomes, weighting each item by the inverse of the covariance matrix of the standardized outcomes (following Anderson (2008)). Finally, when we examine individual survey outcomes, we adjust p-values using the multiple hypotheses testing correction procedure with multiple outcomes and treatments (following List, Shaikh, and Xu (2016), Remark 3.7) and the false discovery rate (FDR) procedure (following Anderson (2008)).

[14] We emphasize to students that we are independent of the government. We promise study participants that we are committed to a high level of security, anonymity, and confidentiality with respect to the data that we collect. We assure participants that we will erase all survey data if we are faced with political pressure to share the data with government or school officials.

[15] We adopt a modified version of the standard list experiment. The modification is first introduced by Coffman, Coffman, and Ericson (2017) and subsequently adopted by Cantoni et al. (2018). A random half of the study participants (the "control group") are asked the total number of statements they agree with among a list of 4 non-sensitive statements. The other half of the participants (the "covered group") are asked the total number of statements they agree with, among the same list of 4 statements plus a sensitive statement of interest. We then append "covered" elicitation with the traditional survey method (namely, the direct question): the control group students in our list experiment setup (those who see 4 statements instead of 5) are asked the politically sensitive questions *directly* in the form of "yes" or "no." The sensitive political attitude of interest is: "I completely trust the central government of China," and we report the percentage of "no" as indicators of those who do not completely trust the central government.

[16] The category-level z-score indices are constructed from z-score indices of all corresponding subcategories of outcomes. We do not construct z-score index for the subcategories of outcomes where all variables are derived from a single survey question (e.g. indicators of top ranks in a single ranking question, as in Category A.7). The index also captures broad changes that are only imperfectly measured by any single survey question.

3.4 Timing and logistical details

Recruitment & baseline survey *(November 2015)* We recruit experiment participants from undergraduate students at two universities in Beijing: one is top ranked and considered the most liberal university in China, the other is ranked slightly lower. We believe that the group of students we study are of particular interest since elite students are core participants of anti-authoritarian movements to challenge the incumbent regime, not only in China but around the globe, and their views are likely to shape Chinese political discourse in the future. Nonetheless, one should be cautious when generalizing our results to other demographic groups in China. On one hand, elite (and often liberally-minded) college students in China are selected to be technologically savvy and intellectually curious. This may lead our estimated treatment effects to be larger than that for other Chinese citizens. On the other hand, many of our study participants come from advantaged backgrounds. They may benefit more from the regime at its status quo, and they are already fairly informed even prior to the experimental intervention. Elite students could also face tighter time constraints due to school work. These imply that our estimated effects may actually be smaller than the average effect among all Chinese citizens.

Recruitment is implemented via email and WeChat messages, and we end the recruitment process once the goal of 1,800 eligible study participants has been reached.[17] Potential participants are informed that this is an academic research project that aims to understand Chinese college students' beliefs, attitudes, and behaviors during the age of globalization, and it involves repeated surveys over the course of 18 months. The provision of the censorship circumvention tool (or, the Internet more broadly speaking) is never mentioned during the recruitment process, which assuages concerns about sample selection based on students' interest in uncensored information *a priori*. The baseline survey takes about 90 minutes to complete, and students are paid US$ 15 for participating, and an additional US$ 10 bonus payment, on average, depending on their survey answers. In addition to pre-treatment levels of outcomes of interest, the baseline survey collects a rich set of demographics and background characteristics, as well as participants' fundamental preferences including risk preferences, time preferences, and social preferences (see Appendix D, Panel F, for details). They serve as the basis for experimental balance checks and the criteria for heterogeneity analyses.

In total, we successfully recruit 1,807 study participants who complete the baseline survey (see Appendix Table A.1 for summary statistics). Among them, 1,490 are from the elite university (or 15% of its undergraduate population), and 317 from the lower ranked university (or 3% of its undergraduate body).

Treatment assignment *(December 2015)* After we conclude the baseline survey, we distribute the access treatment and the first encouragement newsletter simultaneously. This treatment assignment stage excludes 331 study participants — 22.0% of the students at the elite university and 3.4% at the lower ranked university — who have been using (any) censorship circumvention tools. We randomly assign two-thirds

[17] We restrict participation eligibility to full-time registered undergraduate students, and who are citizens of the People's Republic of China. Both universities offer a comprehensive set of undergraduate majors and academic programs. In order to protect the study participants, we conceal the identity of these two universities per IRB arrangement. Since the universities' administration prohibits campus-wide mass email, we deploy a combination of department level mass email and informal social recruitment via class heads. Our recruitment message reaches all undergraduate students at the elite university, which constitutes our sampling frame. We face severe political pressure when implementing the study at the lower ranked university, and we terminate the planned recruitment effort before it has been fully rolled out. Hence, it is difficult to estimate the exact number of students from this university eventually reached by our recruitment message. As a result, our sample is *not* representative of the university population by cohort and by major. This does not threaten the internal validity of our findings, but should be kept in mind nonetheless. We analyze the treatment effects heterogeneity along characteristics such as students' gender, age, and college major in Section 5.1.2.

of the 1,476 non-existing users to the access treatment, and cross-randomize another two-thirds to receive the encouragement treatment. The one-to-two ratio is chosen to maximize power, accounting for the potential low take-up rate for the access and encouragement treatments. We stratify the randomization at the university-gender-cohort level.

Midline *(May 2016)* and endline surveys *(April 2017)* We invite all participants to a midline survey and an endline survey 6 months and 18 months after we distribute the treatment, respectively. Each survey takes approximately 60 minutes to complete, and students are rewarded US$ 20 for participation, with an additional US$ 10 bonus payment, on average, depending on their survey answers. A total of 1,617 students complete the midline survey, and 1,372 students completed the endline survey (see Appendix Table A.2 and A.3 for summary statistics). These 1,372 students constitute the paper's main sample throughout.

Attrition and balance checks The attrition rate is 24.1% between the baseline and endline surveys. The relatively high attrition is likely due to the fact that we could not collect students' dorm room address and hence communication with study participants is restricted to online methods. We do not think attrition severely biases treatment effects estimations. First, survey attrition does not affect tracking of treated students' online activities, so long as they do not actively uninstall the censorship circumvention tool. Second, there is little evidence of selective attrition: *(i)* attrition rate does not differ by treatment status (p-value = 0.782); *(ii)* we cannot reject the null hypotheses that the baseline sample and endline samples are identical across the main demographics, background characteristics, and fundamental preferences examined in Table 1 (column 1 presents summary statistics of baseline participants; column 2 presents those for endline participants; column 3 reports the p-values of t-tests comparing their means; and Appendix Table A.4 provides comparisons of all baseline survey variables); and *(iii)* none of the 5 outcome categories measured at baseline significantly predicts attrition, and importantly, the magnitudes of these associations are small (Appendix Table A.5 reports results where we predict whether a participant attrits from the endline survey with a z-score index summarizing all variables in a given outcome category, her treatment status, and their interaction). Finally, we present three robustness exercises: *(i)* results on acquisition of sensitive information is robust if we exclude subjects attrited in the endline survey; *(ii)* bounds of estimated treatment effects taking into account of attrition are constructed (following Lee (2009)); and *(iii)* majority of the results are robust if we re-estimate the treatment effects using midline survey with a less attrited panel sample, although we acknowledge that outcomes of interests such as renewal of censorship circumvention tool are not elicited in the midline survey.

Among the 1,372 study participants who have completed the endline survey, Table 1 presents the summary statistics of those who are existing users (column 4), and those assigned with each of the 4 treatment groups separately (columns 5-8). For each characteristic, we conduct an ANOVA test against the null hypothesis that students across the 4 experimental treatment groups are not jointly different from each other, and we report the p-value in column 9. Existing users are from households significantly richer and more politically connected than those who have not purchased such tools prior to the treatment assignment. By contrast, members of the 4 experimental treatment groups are statistically indistinguishable from one another, in regards to 13 out of 17 characteristics examined. The imbalance is driven by imperfect randomization rather than differential attrition across treatment groups, and the estimated treatment effects are robust to controlling for all the imbalanced characteristics.

4 Does access increase acquisition of sensitive information?

4.1 Free provision of access alone does not increase acquisition

Only 55% of the students who receive the free access to uncensored Internet actually activate the tool, despite repeated reminders (Appendix Figure A.4 shows the cumulative activation rate during the first 6 months of the experiment). The low activation rate is unlikely to be an artifact of the treatment distribution modes, because 86% of the students who randomly receive the free Youku VIP (similar to Netflix) account via email and WeChat messages at the same time choose to activate that account within a week. Furthermore, 27% of students who activate the tool are not actively using the tool (defined as a student using the tool on more than 40 days after the encouragement treatment ends; robust to alternative definitions; see Table 2, Panel A, column 1). This is very likely the result of deliberately choosing to uninstall the tool.

These *Group-A* students spend virtually no time on browsing foreign news websites throughout the experiment (see Table 2, Panel B, column 1; assuming that students without activated accounts spend zero minute on these websites). This is true even among the positively selected subgroup who actively use the tool to bypass censorship (see Table 2, Panel C, column 1; Appendix Table A.6 reports predictors of activating the censorship circumvention tool, and Appendix Table A.7 reports predictors of active usage of the tool). The pattern is very similar if we restrict attention to students who completed endline survey (Appendix Table A.8). Overall, less than 5% of the students who actively use censorship circumvention tool regularly browse foreign news websites (if they visit these websites more than twice per week on average; Appendix Figure A.5 shows the cumulative density plot of the average number of days and total minutes per week students visit the *New York Times*). Moreover, we do not observe a trend in which active users gradually start to browse any foreign news websites even months after the tool is distributed, as we trace the weekly time they spend on the *New York Times* (Figure 1, solid blue line) and all top foreign news websites (Appendix Figure A.6). Finally, there is little evidence that these *Group-A* students acquire politically sensitive information from other foreign sources. The total time they spend browsing foreign websites is uncorrelated with the occurrences of politically sensitive events (p-value = 0.552), measured as the share of articles published on the *New York Times* Chinese edition that report such events.[18]

Taken together, these results demonstrate that the free access to uncensored Internet alone has little effect on students' acquisition of politically sensitive information from foreign news outlets. Students' demand for sensitive information may be low to begin with, which we investigate next.

4.2 Temporary encouragement boosts immediate information acquisition

When we encourage students to consume uncensored information from foreign news outlets, they respond. Students in *Group-AE* are 14 percentage points (25%) more likely to activate the censorship circumvention tool, compared to those who are only given the access treatment (Table 2, Panel A; see Appendix Figure A.4 for divergence in cumulative activation rates).

[18]On average, *Group-A* students who actively use the tool spend 79.2 minutes per day browsing foreign websites. The top 4 websites they spend time on are: Google and related services such as Google Maps and Gmail (17.5 minutes per day, or 22% of daily browsing time), YouTube (9.1 minutes per day, or 11% of daily browsing time), Facebook (7.7 minutes per day, or 10% of daily browsing time), and Twitter (7.1 minutes per day, or 9% of daily browsing time). Since these websites are encrypted, we observe neither the search inquiries on Google, nor the specific urls that students click through.

More importantly, the financial incentives to visit the Chinese edition of the *New York Times* increases the time students spend on this outlet during the encouragement period. The solid red line in Figure 1 traces the average weekly time spent on the *New York Times* among *Group-AE* students who activate the tool. Small monetary incentives during the 2nd phase of the encouragement treatment increases these students' time spent on the *New York Times* to 5.6 minutes/week during that period. Similar pattern is observed in the extensive margin as we trace the percentage of students who regularly browse the *New York Times* over time (see Appendix Figure A.7).

Students' lack of response during the 1st phase of the encouragement treatment, which is purely informational, suggests that ignorance of foreign news outlets and their whereabouts is unlikely to be the primary reason that students do not demand access to uncensored information. In addition, their responsiveness to financial incentives of modest magnitudes during the 2nd phase suggests that political fear is unlikely a dominate reason they choose not to browse sensitive information. Note that the contrasting responses to 1st and 2nd phases of the encouragement are unlikely to be driven by general shifts in students' demand for foreign news that precisely coincide with the timing we switch phases, because we do not observe a sharp change among *Group-A* students.

4.3 Increase in information acquisition persists after encouragement ends

When the 4-month encouragement treatment ends, the increase in students' information acquisition from foreign news websites persists (Figure 1). The encouragement treatment increases the browsing time on the *New York Times* by 3.4 minutes/week, among all students receiving the access treatment (assuming that those without activated accounts spend zero minute on the *New York Times*). Similar pattern is evident among active users only, despite the negative selection of the marginal active users in *Group-AE* (increased by 6.7 minutes/week; see Table 2, Panels B and C; also see Appendix Table A.8 for similar comparisons among those who completed endline survey). This is corroborated by students' self-report, as *Group-AE* students are significantly more likely to state in the endline survey that they visit foreign news outlets more frequently to obtain information (Appendix Figure A.8 and Appendix Table A.9).

This increase is not driven by the encouragement treatment changing the underlying selection of who browse foreign news websites, since essentially no students spend time on the foreign news websites without the encouragement. Neither is the increase driven by a small number of students, and the comparison of the median student who activate the tool demonstrates an even sharper difference (Appendix Figure A.5 compares the overall distribution between *Group-A* and *Group-AE* students). Finally, the increase in the *New York Times* browsing time is unlikely a result of students switching away from other foreign news websites, since the total time they spend on top foreign news websites other than the *New York Times* remains very close to zero minutes throughout the experiment.

Although the absolute minutes increased seem low, the raised *New York Times* consumption represents a substantial change. Even the 0.9 million paid subscribers of the *New York Times* in the US only spend 12.9 minutes/week on average on the website.[19] Moreover, the encouragement treatment leads students to seek out information from blocked websites beyond the one we encourage them to visit. In particular, *Group-*

[19]Source: "Social, Search and Direct: Pathways to Digital News" by Pew Research Center 2014, which is based on data collected by ComScore. `http://www.journalism.org/2014/03/13/social-search-direct/`, last accessed on January 8th, 2017. Assuming that an average Chinese reader can read 700 characters per minute, the increased *New York Times* browsing time is approximately equivalent to the time needed to read 17 headlines and news excerpts, or to skim through one medium-length article every weekday.

AE students begin to spend more time on Wikipedia, as shown in Table 2, Panels B and C. We speculate that sensitive news events reported on the *New York Times* prompt students to explore similarly sensitive, censored events in history, of which Wikipedia is a primary source of information. There could be other increases that we do not explicitly categorize. However, interestingly, *Group-AE* students do not begin to regularly visit other foreign news websites, presumably because the value added of browsing a second foreign news website (e.g. the *Wall Street Journal*) is limited after having already visited the *New York Times*. Finally, the increased browsing time in the *New York Times* can be complementary to acquisition of sensitive information from social media platforms. While students in *A* and *AE* groups spend similar amounts of time on Facebook, Twitter, and YouTube, it is likely that *Group-AE* students begin to consume different types of information on these platforms. We unfortunately cannot observe what students browse on these websites since traffic towards them is encrypted.

***Group-AE* students respond to news shocks** To test whether *Group-AE* students acquire politically sensitive information from the *New York Times*, we examine the extent to which their browsing time responds to sensitive news shocks. We first measure "news peaks" as the weekly share of articles published on the *New York Times* Chinese edition that report politically sensitive events not covered by domestic Chinese news outlets.[20] This measure ranges from 26% during the 50th anniversary of the *Cultural Revolution* in May 2016 to 4% during the 2017 Chinese New Year.

We then superimpose this measure on students' *New York Times* browsing time during the corresponding week (dotted line in Figure 1). They closely track each other. For example, when news on the Panama Papers broke (the week of April 4th, 2016) and when President Trump called the President of Taiwan (the week of December 5th, 2016) — two of the highest news peaks during the experiment — *Group-AE* students increased their weekly browsing time on the *New York Times* by 157% and 180% compared to their average consumption, respectively. Overall, a 10% increase in the share of politically sensitive articles published corresponds to students spending 1.8 more minutes on the website during that week (see Appendix Table A.10 for regression results). Nonetheless, the extensive margin — measured as the percentage of *Group-AE* students who regularly visit the *New York Times* — does not vary nearly as much as the browsing time. This suggests that *Group-AE* students visit the website at a fairly stable frequency, but spend additional time browsing during the weeks when there are more articles they have not yet seen on domestic news websites, which remain as most students' primary source of information (see Appendix Table A.9, Panel A).

Encouragement raises willingness to pay for uncensored Internet access The persistent increase in students' acquisition of sensitive information may reflect their raised demand for such information, and for uncensored Internet access, more broadly. To test this hypothesis, we compare the average level of willingness to pay for any kind of censorship circumvention tools across different groups of students. Figure 2 plots the willingness to pay in US$/month, repeatedly elicited using a BDM method. As one would expect, at the time of the baseline survey (prior to treatment assignment), existing users are willing to pay 70% more for the access to uncensored Internet, compared to those students who have not purchased a censorship circumvention tool yet. Students in the *AE* group increase their willingness to pay by US$ 1.05/month,

[20] For each article published on the *New York Times* Chinese edition, we categorize it as politically sensitive either if it covers the topics explicitly mentioned in censorship commands issued by the Chinese Communist Party's Propaganda Department (source: *China Digital Times*, collected by the Berkeley Counter-Power Lab), or if a Baidu query of the article title fails to return a relevant news story among the first 5 pages of the query outcomes.

or 34%, considerably closing the gap with that of existing users by the endline survey.

Group-AE students' increased demand is also captured by their decisions to purchase uncensored Internet access. At the endline survey, we provide all study participants with an opportunity to purchase or renew their subscription to access uncensored Internet. Approximately 23% of the *Group-AE* students renew their access, and they pay on average US$ 21.50 up front for a seasonal subscription (darker bars in Figure 3).[21] If we count the students who intend to purchase censorship circumvention tools other than the one we provide (lighter bars in Figure 3), then 52% of the *Group-AE* students are likely to continue having access to uncensored Internet after the experiment, in contrast to their lack of interest 18 months earlier.

While *Group-AE* students' desire to acquire politically sensitive information plays a crucial role in explaining their raised demand for uncensored Internet access, sensitive information is not the exclusive reason they decide to continue the access. Nearly 21% of the *Group-A* students also intend to renew their access. Since almost no *Group-A* students use the censorship circumvention tool to browse foreign news websites, this suggests that access to Google, social media, and entertainment websites may be a nonnegligible component of *Group-AE* students' raised demand.

4.4 Why is demand for uncensored information low?

Taken together, the evidence presented above suggests that students' low demand for uncensored information is unlikely to be caused by inherent or fixed factors, such as an intrinsic lack of interest in politics or fear of government reprisal. In fact, students in our experiment are politically engaged and not afraid to consume politically sensitive information. Once students become familiar with a reliable foreign news outlet where they can look for uncensored information, they are willing to spend time browsing articles reporting heavily censored news events.

An important — although not necessarily exclusive — reason students exhibit low demand for uncensored information is their belief that such information is not valuable. While less than 1% of the students state, in the baseline survey, that they are unaware of Internet censorship in China, they hold considerably diverse beliefs regarding the extent to which content on domestic media is censored. Specifically, a key dimension of this belief is students' assessment of the value difference between foreign and domestic news outlets, and whether the value-added of foreign outlets justifies the cost of access. Among other questions, we ask students:

> Suppose you have already read about a particular piece of news from a domestic news outlet (e.g. *Xinjin* Paper; *Caijin*; The *Southern Weekend*), how much extra information will you learn if you read news stories from foreign news outlets (e.g. The *New York Times*; The *Wall Street Journal*; The *Financial Times*) in addition?
> 0 = no extra information will be learned;
> 10 = I will learn almost everything from the foreign news outlet.

This dimension of belief on foreign news outlets strongly predicts the usage of censorship circumvention tools prior to the experiment: during the baseline survey, existing users are more likely to believe that foreign news outlets are high value-added compared to non-users (p-value < 0.001). Moreover, while

[21] This is a significantly higher renewal rate compared to that among the *Group-A* students. Less than 1% of *Group-C* students purchase the subscription of the tool that we offer. Approximately 8% of the existing users take up the offer. They switch from the service that they are currently using, suggesting a combination of search friction (e.g. they may not have heard of this particular premium tool before) and price discounting (e.g. the offered subscription may be cheaper than their current options).

students in the control group continue to believe that foreign news outlets are not particularly valuable, as *Group-AE* students become exposed to reputable foreign news outlets, they significantly raise assessment of the value of these outlets (Appendix Figure A.9, Panel A, 2nd graph).

We observe similar patterns across many dimensions of media-related beliefs (Appendix Figure A.9, Panel A, summarizes belief subcategories into z-score indices; Appendix Figure A.8 presents individual dimension of beliefs; and Appendix Table A.9, Panel A, presents regression results). For example, *Group-AE* students become more likely to believe that content on domestic media outlets is heavily censored. Relatedly, they become less likely to trust domestic outlets, and more likely to trust the foreign counterparts. Note that there can be other belief changes such as perceiving content on foreign outlets as more entertaining that we do not explicitly capture in the survey.

If we assume that exposure to foreign news outlets makes beliefs about their quality and value more accurate (as we would expect if students are Bayesian), the patterns above imply that students' beliefs about the quality and value of foreign news outlets are biased downward at the baseline survey.[22] In Appendix F, we develop a formal model of students' consumption of foreign news outlets using the one-armed bandit problem framework.[23] Following this framework, if students sufficiently underestimate the value of foreign news outlets, they may never choose to acquire information from these outlets. However, consumption of information on foreign news outlets would increase *both* during and after the period during which we encourage students to visit these outlets. In particular, one would expect that acquiring information from foreign news outlets during the encouragement period allows students to upwardly update their beliefs regarding the value of these outlets, which would result in a persistent increase in consumption of such outlets. This is precisely what we observe among *Group-AE* students.

It is important to emphasize that the evidence presented here does not rule out mechanisms other than learning that may explain the persistent increase in the demand for uncensored, sensitive information. For example, students may hold accurate prior beliefs about foreign media, but exposure induces upwardly biased belief updating. Beyond the belief-related mechanisms, visiting foreign news websites may be associated with a one-time, substantial mental cost. In addition, students may procrastinate in setting up the censorship circumvention tools. Another prominent candidate is habit formation that features intertemporal complementarity in consumption (e.g. Charness and Gneezy (2009) and Hussam et al. (2016)). While our experiment is not designed to distinguish between belief-driven and preference-driven models of media consumption, it is nevertheless worth noting that habit formation alone does not necessarily generate the same pattern of belief updating that we document (see Appendix G for a discussion on habit formation and rational addiction). Yet another hypothesis is gift exchange, since the *Group-AE* students receive additional bonus payment from the experimenter. While we cannot fully rule out the income effect, it is important to note that control group students are indistinguishable from those whom in addition receive

[22] Downwardly biased beliefs may be an outcome of underexposure to blocked foreign news outlets. Another potential factor is the propaganda campaigns launched by the Chinese state regarding Western news media. In fact, *Foreign Policy* notes that while China ranks among the lowest in terms of media freedom, intriguingly, the conversation among Chinese citizens "regularly centers around perceived media bias elsewhere." Source: `https://foreignpolicy.com/2016/03/04/china-won-war-western-media-censorship-propaganda-communist-party`, last accessed on June 20th, 2017. This pYet another consistent hypothesis is that citizens in authoritarian regimes do not discuss alternative information sources with each other, because they do not know what others believe (Kuran, 1997).

[23] Armed bandit problems have been extensively used to study technological adoption decisions in many development contexts, and they highlight the process of people learning the value of new and unfamiliar technology. See Foster and Rosenzweig (2010) for a survey of the literature. Lack of consumption of uncensored, costly media outlets is also consistent with rational inattention (e.g. Caplin and Dean (2015)).

the encouragement treatment (*Group-CE*) in terms of their media-related beliefs during midline and endline surveys. This assuages the concern that the belief updating and persistent increase in media consumption among *Group-AE* students is entirely driven by experimenter demand effects (Appendix Figure A.10).

Finally, the mechanism that citizens learn about unfamiliar media outlets or build habits of browsing could be a generic one. Even in societies absent of explicit censorship, a temporary encouragement may induce persistent increase in news consumption, and our experimental structure can be readily ported to contexts beyond authoritarian regimes.

5 What is the impact when students acquire sensitive information?

So far, we have shown that when the access treatment is combined with temporary encouragement, it effectively induces students to acquire uncensored, sensitive information. Does the acquisition of sensitive information affect students' knowledge, economic beliefs, political attitudes, and behaviors? If so, does the impact spill over to others in the social network?

5.1 Impact on students directly exposed

To measure the impact of uncensored information on those students who are directly exposed, we exploit the variation in their acquisition of such information generated by the experimental treatment. Table 3 presents regression results where we summarize all endline questions in each outcome category preregistered with an z-score index. Panel A represents the *intent-to-treat* effects, as well as bounds on *Group-AE* effect taking into account of attrition; and Panel B shows two stage estimates, representing *treatment-on-the-treated* effects, where we regress treatment status on being an active user of the censorship circumvention tool as the first stage. The baseline results are robust to a range of alternative specifications (Table A.11).

We report the regression estimates on all individual endline questions in Appendix Table A.9, where we control for the demographic and background characteristics that are imbalanced across treatment groups, as well as students' answers to these questions in the baseline survey when applicable (see similar regression estimates on all midline survey outcomes in Appendix E). Appendix Figure A.9 presents the results graphically, broken down by sub-categories. Appendix Figure A.11, A.12, and A.13 show comparisons across all individual questions in the endline survey. For simplicity, we pool control group students with and without the encouragement treatment together (labeled as *Group-C*) in these figures and in our discussions below, since these students do not differ in almost any dimension. Appendix Figures A.14, A.15 and A.16 present results comparing *C* (unpooled) and *CE* students.

More informed of sensitive events Treated students are more informed of current events that are politically sensitive. We administer a set of 7 quizzes on such events that occurred within 3 months of the endline survey *(Category B.2 of the survey)*. These events range from President Trump's business in China to the Xinjiang government's surveillance effort of automobiles. None of these events are explicitly covered in the encouragement material. Students in the *AE* group can answer 0.902 more quizzes correctly. Importantly, the quizzes are able to capture knowledge stock: treated students' access subscription terminates just before the endline survey, making them unable to look up answers on Google or the *New York Times* until they are given the chance to renew the tool in the later part of the survey. In contrast, the acquisition

of sensitive information does not enable *Group-AE* students to correctly answer more quizzes for events covered by the domestic media during the same period. Students in all groups are equally likely to know events such as China stopped importing coal from North Korea in response to the newly enacted sanction. This not only indicates that acquiring uncensored information increases knowledge specifically in domains that are otherwise unavailable on domestic news outlets, but also suggests that foreign news consumption does not substantially crowd out attention on domestic news websites.

As newly exposed students realize that sensitive contemporary events remain unreported on domestic news outlets, they may suspect that censored events exist throughout history. Indeed, *Group-AE* students become 42.4% more likely to have heard of protest events in Greater China during the past decade (e.g. the Hong Kong Umbrella Movement in 2014), and 13.7% more likely to have heard of foreign protests and independence movements (e.g. the Arab Spring in 2011), all of which are highly politically sensitive and tightly censored *(Category B.3)*. A likely source of such information is Wikipedia, of which we observe an increased consumption among *Group-AE* students. As a placebo, we ask students whether they have heard of the "Tomorrow Revolution", a fake protest we create. The overall proportion of students indicating that they have heard of this event is indistinguishable from zero.

Finally, acquiring uncensored information also affects students' assessments of their own informedness *(Category B.5)*. We find that *Group-AE* students become more likely to consider themselves better informed of political issues in China in absolute terms. Interestingly, when comparing themselves to their peers, *Group-AE* students also become more optimistic about other students' level of informedness.[24]

More pessimistic about China's economic performance When students are asked to guess China's GDP growth rate in 2017 in an incentive-compatible manner, those in the *AE* group believe that the actual growth rate would be 5.92% (0.90 percentage points lower than that of the *Group-C* and *Group-A* students). This is a substantial decrease in optimism, and it falls below the government's explicit target (6.50%) and predictions by the Chinese Academy of Social Sciences (6.60%).[25] Moreover, *Group-AE* students lower their predictions of the closing level of the Shanghai Stock Composite Index at the end of 2017 by 317.3 index points (to 3,046.2; the closing level was 3,154.7 at the time when students made predictions). They actually become slightly too pessimistic given that the realized year-end closing level was 3,307.2, albeit the precise welfare implication remains difficult to assess.

Contrary to the increased pessimism on China, exposure makes *Group-AE* students more optimistic about US economic performance, again elicited in an incentive-compatible manner *(Category C.3)*. For example, their prediction about the US's GDP growth rate during 2017 is 1.19 percentage points higher than that of *Group-C* students. Many students anchor the US's growth rate by halving their guess on China, resulting in an average guess (2.69%) considerably higher than the past growth rate in the US (1.60% in 2016). Hence, optimism about the US moves *Group-AE* students further away from the realized growth rate.

Interestingly, we find that while uncensored information significantly affects students' economic beliefs, it barely changes their levels of confidence regarding their own predictions *(Category C.2 and C.4)*.

[24] We explicitly study beliefs regarding others in a companion paper (Chen and Yang, 2017). In particular, we find that *Group-C* students believe that students who have never used the censorship circumvention tool are equally likely to correctly answer news quizzes compared to those who have been using the tool before the experiment starts. This suggests that an important reason for low demand for uncensored Internet access is that students do not realize that uncensored information can make a difference.

[25] Source: "Outlook of the 2017 Chinese Economy" by the Chinese Academy of Social Sciences, `http://world.people.com.cn/n1/2017/0502/c190967-29248328.html`, last accessed on May 10, 2017.

More skeptical of China's governance Uncensored information changes students' political attitudes. For example, when we ask students to evaluate the government's performance in the realm of economics (and politics) during the past year (on a scale of 0-10, where 10 indicates full satisfaction), newly exposed students in *Group-AE* report a rating 1.254 (and 1.308) lower than that of the students in the *C* and *A* groups. Moreover, the newly exposed students report lower trust towards China's central government by 1.58 (on a scale of 0-10, where 10 indicates complete trust), representing a decrease in political trust of 21.3%, compared to that of the unexposed students.

In fact, treatment effects are observed across a broad range of political attitudes. Compared to unexposed students, *Group-AE* students become more likely to believe that both the economic and political systems in China need fundamental changes *(Category D.1)*; more likely to express distrust of China's central, provincial, and local governments, and domestic financial institutions, while more likely to state a higher trust of Japanese and the US governments *(Category D.2)*; more likely to be unsatisfied with the Chinese government's performance in economic development and domestic politics (while their level of satisfaction in the domain of diplomatic affairs is unchanged) *(Category D.3)*; more likely to consider living in a democratic society important *(Category D.6)*; and slightly more likely to state that they are willing to battle illegal actions conducted by the government and to stand up to fight for the weak (although unchanged in terms of their willingness to report the government's misconduct) *(Category D.8)*.

Changes in behaviors and planned behaviors Finally, acquiring uncensored information leads to changes in some of the self-reported behaviors. Compared to unexposed students, *Group-AE* students become more likely to report that they discuss political topics with other students, an increase by 0.67 on a scale of 10 *(Category E.1)*; and more likely to report, among the 4% of students who were invested in the Chinese stock market, that they have pulled investments out *(Category E.3)*.[26] *Group-AE* students, however, are *no* more likely to report participating in various political activities, such as protests concerning social issues, and voting for the local People's Congress Representatives *(Category E.2)*.

Uncensored information also affects newly exposed students' future plans. *Group-AE* students are 13.5 percentage points more likely to plan on applying to overseas graduate schools and hence leaving China in the near future, a substantial increase compared to the 21.1% of students in *C* and *A* groups who report having such plans *(Category E.4)*. Exposure to uncensored information also makes students more likely to prefer foreign cities for future work and residence, although they do not change the sectoral preferences of their careers *(Category E.5)*. These results suggest that uncensored information primarily leads to plans on exiting, rather than actively engaging with the regime.

5.1.1 Magnitude of the effects

The magnitude of the treatment effects is specific to the study sample (e.g. the elite student population), the time frame (e.g. 2016 and 2017 are two unusually eventful years), the specific foreign news outlet we encourage students to visit, and the relatively small scale of the experiment. With this in mind, the *local* effects of acquiring politically sensitive information that we identify are substantial in magnitude. The two stage

[26] We do not know what portfolio students hold prior to the experiment. If we assume that the average student holds a portfolio that tracks the Shanghai Stock Index, then pulling out of stock market makes students better off. The Chinese stock market was among the world's worst performers in 2016: the Shanghai Composite Index decreased by 12.5% in 2016, compared to the Hong Kong Hang Seng Index's 0.6% fall.

estimates, shown in Table 3, Panel B, suggest that actively browsing foreign uncensored websites increases students' knowledge on politically sensitive events by 0.63 of a standard deviation, for instance. Such changes significantly close the gaps between students newly exposed to uncensored information and the existing users in terms of their knowledge, economic beliefs, political attitudes, and behaviors. Nonetheless, convergence with existing users does not necessarily mean converging towards truth.

Another way to quantify the magnitude of the treatment effects is to measure the quantile movement of a median *Group-AE* student (Appendix Table A.12). If we rank students across all dimensions of the outcomes of interest, we find that the median *Group-AE* student is ranked at the 47th percentile of the distribution of all study participants at the baseline survey, before the experiment starts. The treatment has moved these students to the 56th percentile of the distribution by the endline survey.

Yet another way to benchmark the effects is to compute the "persuasion rate" (following DellaVigna and Kaplan (2007)), which indicates the estimated percentage of students who do not initially hold, say, skepticism towards the Chinese government ("uncensored attitude") but change their attitudes once they are treated. Note that the name of this measure by no means suggests we could distinguish between foreign media "persuading" students or providing students with objective information, since we are unable to benchmark truth. For each outcome of interest, we calculate this as the *treatment-on-the-treated* effect of the access plus encouragement treatments, divided by the share of *Group-AE* students who do not hold "uncensored attitudes" at the time of the baseline survey. We find that the median persuasion rate across all outcomes of interest is 40.1% (s.e. = 9.17%; Appendix Table A.13). This is considerably larger than the persuasion rates estimated with respect to media in democratic societies, but of a similar magnitude to those found in authoritarian regimes that typically have highly regulated media markets.[27]

5.1.2 Treatment effects heterogeneity

To shed light on the mechanisms of exposure effect, we investigate who is more affected by politically sensitive information. We examine treatment effect heterogeneity across all baseline outcome categories, demographic characteristics, and fundamental preferences (Appendix Figure A.17 plots results from split-sample regressions; Appendix Table A.14 presents regression results, interacting treatment status with all subsample indicators). Due to the large number of heterogeneous effects simultaneously tested and the right-censoring of survey measures, one should interpret these results with caution.

We find four broad patterns. First, acquisition of uncensored information more heavily affects students with low level of baseline knowledge. This suggests that the treatment effects are unlikely to be driven by a "news junkie" type who simply shifts news consumption from domestic to foreign sources once they have access to uncensored Internet. Second, treatment generates larger effects among students who hold more optimistic economic beliefs or more favorable political attitudes prior to the experiment. In other words, students pre-disposed towards China's governance are actually more affected by information contrary to their priors, although there could be short-run backlash that we are unable to capture. Third, treatment effects are much larger among students whose parents are not members of the Communist Party or from

[27] For example, DellaVigna and Kaplan (2007) estimate a persuasion rate from Fox News of approximately 3-8%. Enikolopov, Petrova, and Zhuravskaya (2011) find a persuasion rate of 65% regarding the impact of opposition messages from Russian TV stations on voting to the pro-government party. The persuasion rate we find in this paper is also larger than that documented with regard to school curriculum among a very similar demographic group (Cantoni et al., 2017). A noticeable exception concerns the impact of East Germans watching TV from the West, as Kern and Hainmueller (2009) document that they became more supportive of the East German regime.

households with lower incomes. These patterns are consistent with the hypothesis that students from relatively more disadvantaged backgrounds potentially lack alternative access to uncensored information, and hence the exposure induced by the experiment could lead to more dramatic shocks to their knowledge, beliefs, attitudes, and behaviors. Note that differential selection of students from distinct background admitted to elite colleges could also drive treatment heterogeneity. Finally, treatment effects are positive even among students who are, before the experiment, already fairly informed, less pre-disposed towards China's governance, or from more advantaged background. This indicate that direct access and exposure to uncensored Internet cannot be fully substituted by alternative access to information.

5.2 Social spillover of politically sensitive knowledge

Does the acquisition of uncensored information affect students beyond those who are directly exposed? The rate of information transmission allows us to adjust the naive estimates of direct effects, which are downwardly biased when there is a social spillover. More importantly, it enables us to assess whether a small number of informed students are sufficient to spread uncensored information to a majority of the student population.

We focus on the network of college dorm roommates.[28] The dorm room network, albeit by no means a complete mapping of social network, is closely aligned with the "conversation networks," which play a dominant role in information transmission among university students as demonstrated by Mobius, Phan, and Szeidl (2015). Overall, 57% of students without the access and encouragement treatments reside with at least one treated roommate, and 42% of treated students reside with at least one other treated roommate.

Simple reduced form analyses suggest that the social transmission of information is indeed present. We regress students' likelihood of correctly answering sensitive news quizzes on: *(i)* whether they have access to and actively browse uncensored Internet (either as existing users or students in *Group-AE*); *(ii)* whether they have roommates with access; and the interaction of *(i)* and *(ii)*. The coefficient on roommates' access indicate the differential likelihood of correctly answering news quizzes if a control group student has one treated roommate, relative to none. Table 4, Panel A, presents the results on a sample of 3 quizzes as well as the overall correct rate across 11 quizzes; Appendix Table A.15 shows results on each of the 11 quizzes. Take as an example students' knowledge of the Panama Papers. Among students who neither receive the access and encouragement treatments nor residing with treated roommates, 56% can correctly answer the quiz on the Panama Papers. If the students have one treated roommate, the proportion increases to 78%. The increase is more modest among other news events, but still statistically significant when we aggregate all news quizzes. Patterns of social spillover are mixed regarding outcome categories beyond knowledge (Appendix Table A.16).

To assess whether the magnitude of social spillover is economically meaningful, we next estimate a simple social learning model to quantify the social transmission rate of sensitive information. We consider the probability that a student correctly answer a sensitive news quiz as the sum of: *(i)* the probability that she learns the event from browsing foreign news outlets herself *(direct learning)*; and *(ii)* the probability that she learns about the event from her roommates who have learned about the event *(social learning)*. We allow the social transmission rates to differ across news, and across students with and without direct ac-

[28] A university dorm room in our experimental setting consists of 4 students from the same gender and cohort, assigned by the school administration. The exact algorithm of dorm roommates assignments is unknown, but they are likely to be randomly assigned within the university-gender-cohort-major cell.

cess themselves. Importantly, we assume that there is no information transmission from students who do not have direct access to uncensored Internet, since we cannot separately identify the transmission from students with and without access. This assumption is conservative when we evaluate the marginal contribution of having one additional student to receive access to uncensored Internet. We use the subsample of students with less than 2 treated roommates for parameter estimation (Table 4, Panel B), and those with 2 or more treated roommates for an "out-of-sample test" (Panel C). Appendix H presents the full model and estimation details.

Three patterns emerge. First, across all 11 news dimensions, the transmission rate from an informed student to her roommates without the access is 11.8%. Interestingly, this is a very similar social transmission rate of politically neutral information among Harvard undergraduates (10.3%; Mobius, Phan, and Szeidl (2015)). The calibrated model performs well when we use it to predict the knowledge of sensitive news events among students with 2 or more treated roommates. Given the number of students who have access to uncensored Internet prior to the experiment, this transmission rate is substantially lower than what is needed to induce the entire student population to be informed. Even if we assume that these existing users are randomly distributed across university dorms, the social transmission rate needs to be close to 100% in order to saturate the population. Second, the social transmission rates monotonically increase with the direct learning rates (see Appendix Figure A.18, where we plot the estimated direct learning rates against social transmission rates). If a student is more likely to learn about particular sensitive news event herself, she is also more likely to transmit that knowledge to her roommates. Third, the social transmission rate approximately doubles if the recipient is a fellow roommate who has no direct access herself, suggesting social substitutability in learning with respect to direct access to uncensored information.

Several factors may contribute to the relatively low social transmission rate of politically sensitive information. First and foremost, transmission of censored information is asymmetric: the uninformed students do not know what and when to ask. As a result, the informed students need to take the initiative to discuss sensitive topics. Informed students may not take such initiative, because spreading sensitive information, unlike consuming such information privately, may be perceived as politically risky. In addition, the treated and hence informed students demonstrate the "curse of knowledge": they tend to (mistakenly) believe that other students are equally informed of politically sensitive events (Chen and Yang, 2017). This may further prevent them from taking initiative to transmit the information. Even if informed students decide to spread the information, they face additional constraints. The transmission largely relies on word-of-mouth, since sensitive messages are censored on domestic social media and messaging platforms. Finally, existing users of censorship circumvention tools are highly clustered among a small number of dorm rooms, potentially due to social complementarity.[29] Such a high degree of clustering limits the scope of social transmission.

6 What does it take to undo censorship?

Our experimental results allow us to get a glimpse into what does it take to undo censorship, and what makes China's censorship apparatus effective, despite its porousness. Would most students become informed of sensitive events if a large share of them receive access to uncensored Internet? Would students'

[29] At the time of the baseline survey, 74.8% of the existing users have at least 1 other roommate (31.1% have 2 or more) who are also currently using censorship circumvention tools. In contrast, among students who have not used censorship circumvention tools, only 26.7% of them have at least 1 other roommate (and 9.3% with 2 or more) who are existing users.

low demand for uncensored information be partially offset by the social transmission of information?

Importantly, our experiment captures partial equilibrium effects, since it covers only 15% of the student population of two universities and is not a permanent intervention. On one hand, the general equilibrium treatment effects may be substantially larger because political fear could be eliminated, foreign news consumption becomes more socially acceptable and desirable, or the knowledge of uncensored Internet access is disseminated socially. Supply of sensitive information on domestic and foreign outlets could also change in response to the demand shifts due to a large number of citizens receiving access. On the other hand, the general equilibrium effects may be smaller in magnitude, as the censorship apparatus itself may respond. For example, providing access to the entire population is likely to trigger a crackdown from the regime.

To illustrate, we simulate the share of students who would be able to correctly answer quiz question on the Panama Papers, a particularly high-profile, sensitive news event, if the number of students who actively acquire uncensored information increases. In addition to learning directly from foreign outlets, we incorporate information transmission among dorm mates. Specifically, we first simulate the number of information-acquiring roommates with whom a particular student may reside. We predict whether each student could correctly answer the quiz if there is no social transmission of knowledge. We then predict the number of roommates each student resides with who have acquired the knowledge about the Panama Papers. Finally, we predict the chance each student could correctly answer the quiz if her informed roommates transmit the knowledge. We calibrate the simulation using three sets of previously estimated parameters: *(i)* the degree to which access to uncensored Internet and the temporary encouragement lead students to acquire sensitive information; *(ii)* the degree to which direct exposure affects students' knowledge; and *(iii)* the rate of social transmission of such knowledge. Appendix I provides details on the simulation.

We simulate three scenarios, presented in Figure 4. First, if we were to provide *all* students with free access to uncensored Internet, we could increase the share of students who answer the quiz question correctly by 3 percentage points — a change that is nearly negligible. Most students would not avail themselves of the cracks of the Great Firewall to actively seek out uncensored information. Second, if we were to provide all students with both access and the same temporary encouragement in our experiment, the share of students who could correctly answer the quiz question would jump by another 30 percentage points to 98%, close to the full-saturation. Finally, this large increase could be sustained even if we stop fully subsidizing the access to uncensored Internet. After students receive the encouragement, their raised demand for access would likely persist, and we expect 72% of the newly exposed students would pay to continue accessing uncensored Internet. As a result, the overall share of students who would be able to correctly answer the quiz question would be retained above 90%. The latter two scenarios demonstrate that while the current censorship apparatus is robust due to lack of demand for uncensored information, its effectiveness could be substantially diminished if demand were raised through encouragement and exposure.

To quantify the role played by the social transmission of information, we simulate a scenario with no social spillover (shown in the dotted line in Figure 4). On average, approximately 50% of the increase in knowledge among the student population results from direct learning, while the remaining 50% is contributed by social transmission among roommates. It is worth highlighting that social transmission plays a particularly small role when only existing users are acquiring uncensored information, due to their high degree of clustering among a small number of dorm rooms.

These results are robust to relaxing the key assumptions we make in the simulation procedure. In particular, when we allow for second-degree social transmission, we do not find quantitatively differences

in students' simulated knowledge, given the size of dorm rooms and the estimated transmission rates (consistent with Mobius, Phan, and Szeidl (2015)). In addition, if we use the conversation networks mapped among Harvard undergraduates to simulate the information acquisition and spillovers in our context, we find quantitatively similar results, presumably because the number of roommates in our context (3.00) is close to the average number of conversational links (3.19) a Harvard undergraduate processes. In fact, our result is robust even if we double the number of conversational links a student has.

7 Conclusion

Media censorship is prevalent in authoritarian regimes. Little is known, however, regarding whether censorship is effective at restricting citizens' information acquisition and changing their beliefs and attitudes. In particular, one might have speculated that censorship becomes irrelevant in the age of the Internet where access blockage becomes increasingly costly and technologically challenging. In this project, we conduct a field experiment among college students in China to examine the impact of accessing uncensored Internet. We find that even among students in one of China's most elite and liberal universities, lack of access is not the entire story: low demand for uncensored information is a crucial reason why students don't acquire such information. Beliefs that foreign news outlets are not valuable contribute to the low demand. Importantly, a period of exposure can change these beliefs and result in a lasting increase in their acquisition of uncensored information.

These findings suggest that demand-side factors are important for comprehending how Internet censorship works in China today. Depending on citizens' demand for uncensored information, the censorship apparatus in China can be either robust or fragile. After years of censorship and active propaganda campaigns, both the current level of demand and its elasticity with respect to the degree of censorship are low. Coupled with a moderate rate of socially transmitted knowledge, the regime could be highly robust. As a result, policies such as the Lantern Project that passively supply access to uncensored Internet to citizens in authoritarian regimes are unlikely to be as effective as some might imagine.[30] In fact, the Chinese government may not need to bear the extremely high costs of fully "sealing" its Internet, as it can afford to leave some holes open. The masses may not begin to respond to negative news shocks, information-demanding elites may not be irritated, and business interests relying on global Internet connections may not be sacrificed. Moreover, so long as the Chinese citizens perceive domestic media to be more informative, more enjoyable, or more reputable when feedback is weak due to the Great Firewall, domestic media outlets are incentivized to maintain their censored news reporting in equilibrium (Gentzkow and Shapiro, 2006).

Nevertheless, our findings do *not* imply that the Chinese regime can safely eliminate the Great Firewall. The current cost of circumventing censorship imposes a huge campaign cost on foreign news outlets. Without such costs, outlets such as the *New York Times* might begin to campaign and effectively raise demand among Chinese readers. The demand for uncensored information, once raised, is likely to persist and can generate substantial pressure on the censorship apparatus. Perhaps more importantly, as demand for uncensored information shifts, domestic news outlets are likely to react to such shift, which could fun-

[30]The Lantern Project, funded by the US State Department, aims to provide a stable Internet connection that bypasses censorship at a relatively low cost. Policymakers in the West hypothesize that combating censorship boils down to ensuring that citizens have access to uncensored information. For example, former Secretary of State Hillary Clinton declares that the United States "stand[s] for a single Internet where all of humanity has equal *access* to knowledge and ideas."

damentally change China's media landscape and further suppress demand for censored information (see Qin, Strömberg, and Wu (2018) for an investigation of China's newspaper industry).

This demand-driven censorship is not unique to contemporary China. The current Russian regime enforces repressive censorship over TV, while leaving the Internet, and in particular the social media landscape, largely uncensored. Similarly, during the Cold War, the East German government employed heavy propaganda and censorship campaigns, while simultaneously allowing its citizens to purchase, *de facto*, antennae to access West German TV if they were sufficiently interested. What is an authoritarian regime's optimal strategy for controlling information given our findings? Would such a strategy work even in small regimes where it is unprofitable for a media company to only serve the small domestic market (e.g. Pan (2016))? If not, what would be the alternative strategy? Do information technology innovations — in particular, the Internet and social media — change the effectiveness of state censorship? These are fascinating questions for future research.

Finally, we find that uncensored information persistently and substantially changes students' knowledge, economic beliefs, and political attitudes. Do students realize that consuming uncensored information has made a difference? What happens to their beliefs regarding fellow students? Answers to these questions have important implications on whether coordinated and collective actions may arise, which we explicitly investigate in a companion paper (Chen and Yang, 2017).

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Figures and tables

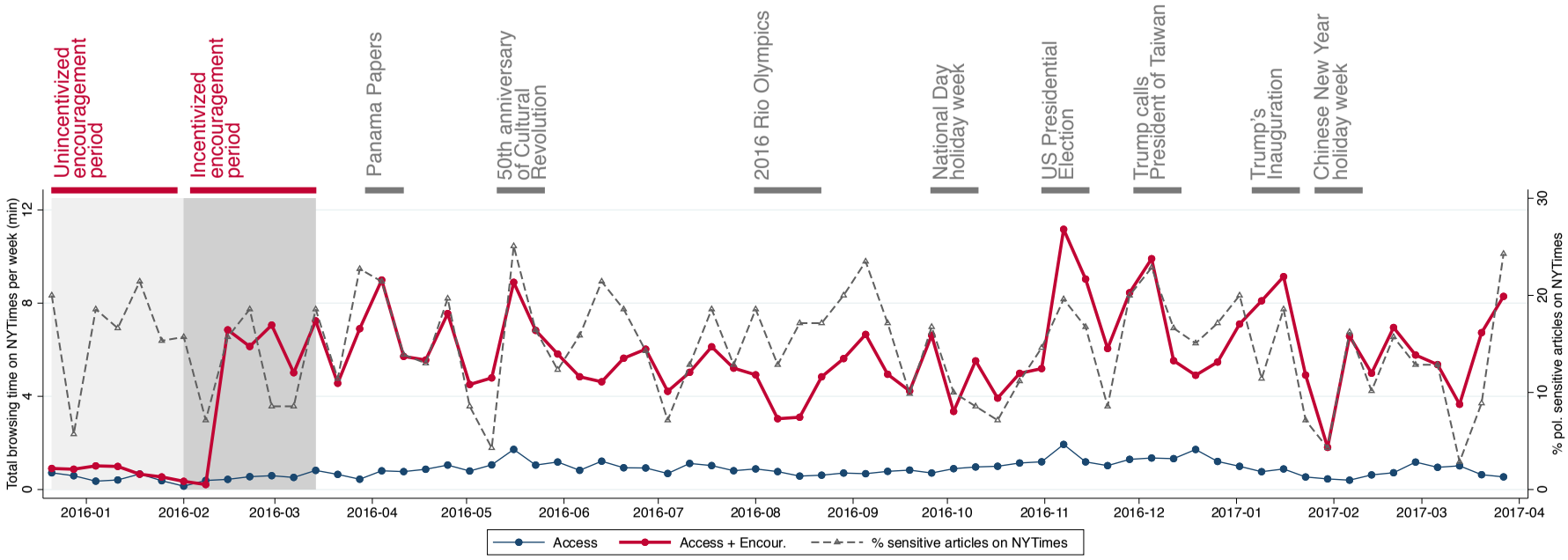

Figure 1: Average total browsing time (minutes) on the *New York Times* per week, among students received only the access treatment (*Group-A*) and those who received both access and encouragement treatments (*Group-AE*). *New York Times* browsing time includes both its English and Chinese websites. Dotted line (y-axis on the right hand side) indicates the proportion of articles published on the *New York Times* that are politically sensitive during that corresponding week.

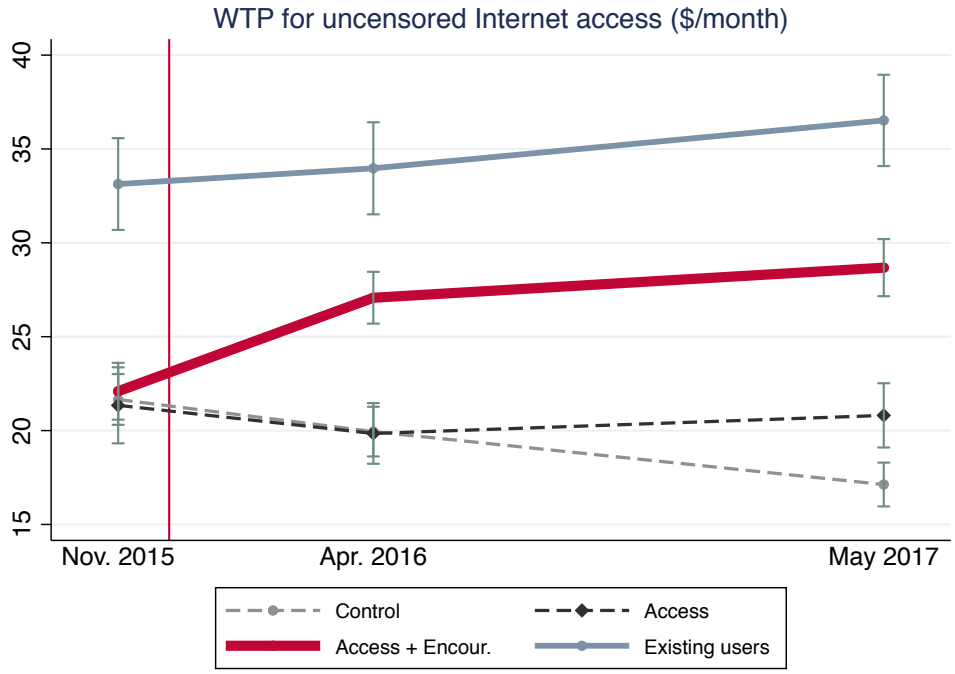

Figure 2: Average level of willingness to pay for accessing censorship circumvention tools (US$ per month), elicited using a BDM method, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) and the existing users, across the baseline survey (November 2015), midline survey (May 2016), and endline survey (April 2017). Sample is restricted to 1,372 students who have completed the endline survey.

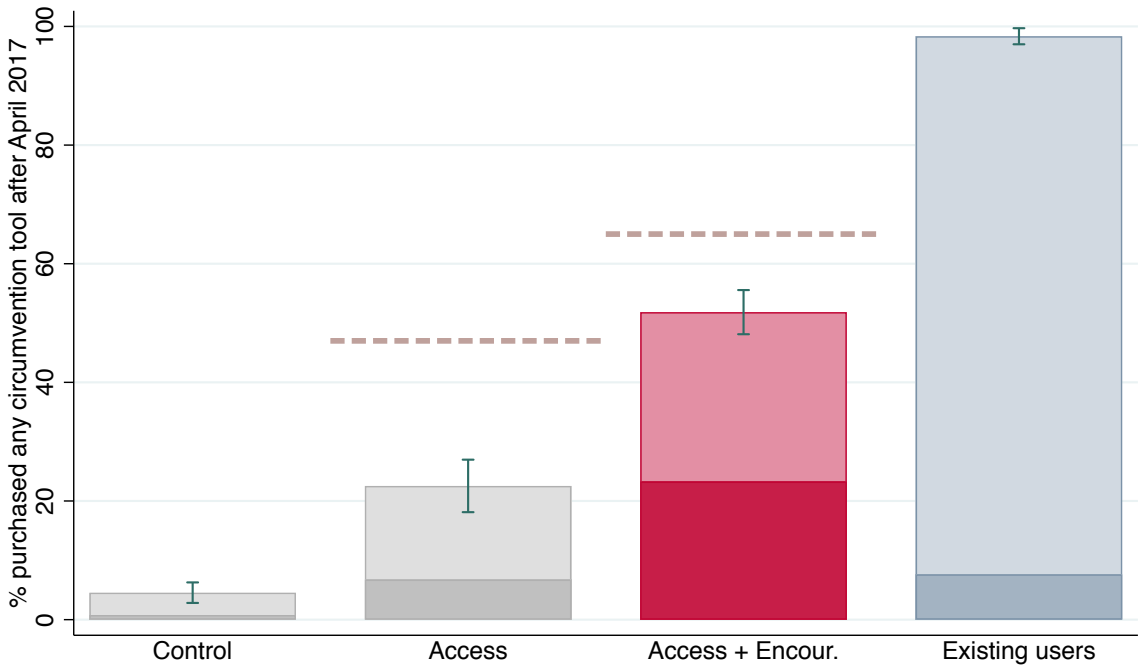

Figure 3: Percentage of students who indicated that they would purchase a censorship circumvention tool at the time of endline survey (April 2017), among students in control group (*Group-C*, pooling *C* and *CE* students together), those who receive only the access treatment (*Group-A*), those who receive both access and encouragement treatments (*Group-AE*) and the existing users. Darker bars indicate the percentage of students who have actually renewed or purchased account of the premium censorship circumvention tool that we offer at a discounted price; lighter bars indicate the percentage of students who report that they would purchase any censorship circumvention tools. Dashed lines indicate % active users among *Group-A* and *Group-AE* students. This is the same tool that we provide as the access treatment, and the free subscription expires before the endline survey. Sample is restricted to 1,372 students who have completed the endline survey.

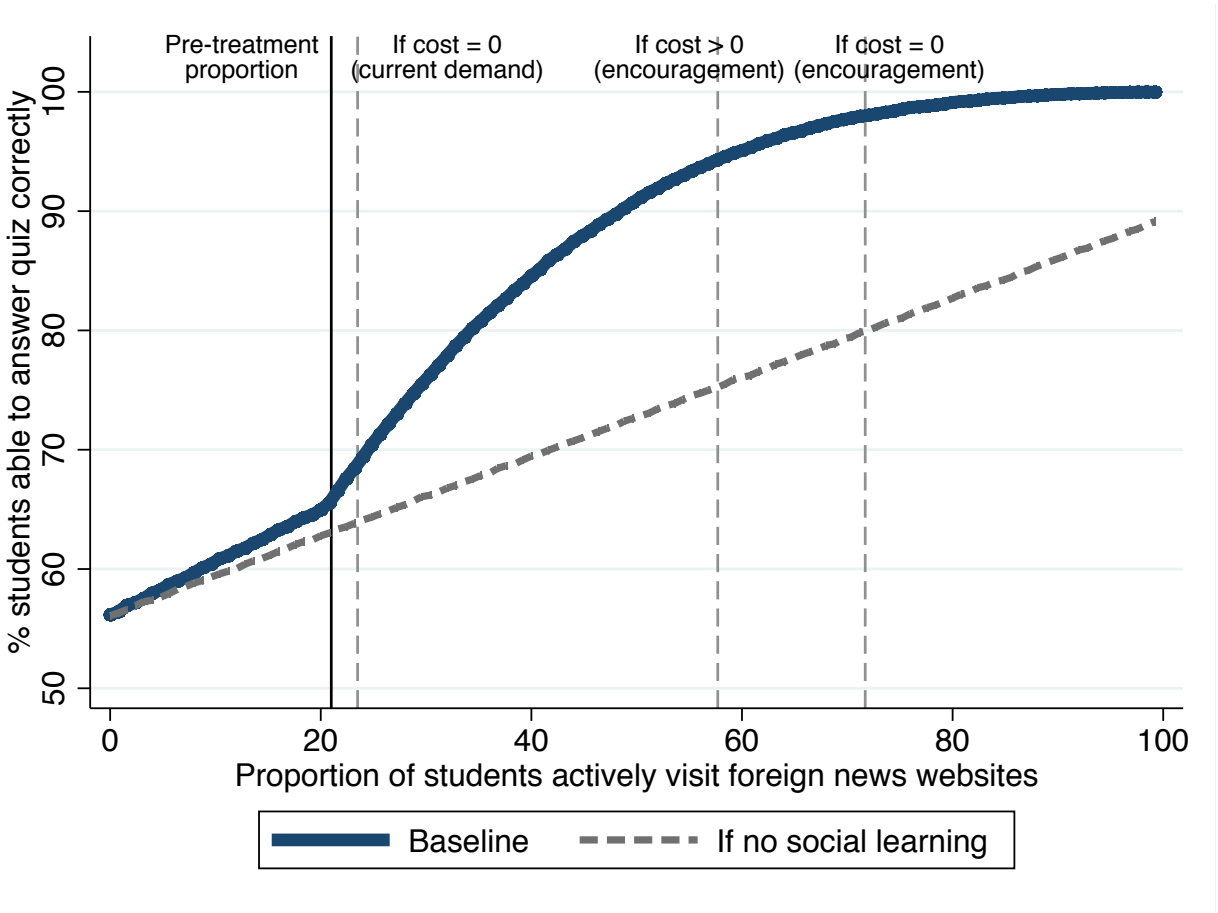

Figure 4: Simulation of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%. Details of the simulation procedure is described in Appendix I.

Table 1: Summary statistics, attrition, balance tests

	Sample & attrition			Treatment balance					
	Baseline Mean (std. dev.)	Endline Mean (std. dev.)	t-test p-value	Exg users Mean	C Mean	CE Mean	A Mean	AE Mean	ANOVA test p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Male	0.559 (0.497)	0.562 (0.496)	0.843	0.630	0.512	0.579	0.597	0.517	0.119
Birth year	1995.8 (1.278)	1995.8 (1.262)	0.696	1995.9	1995.9	1995.8	1995.7	1995.8	0.252
Height	170.1 (9.311)	169.9 (8.951)	0.576	170.6	168.0	170.3	170.4	169.6	0.063
Han ethnicity	0.912 (0.283)	0.914 (0.280)	0.844	0.921	0.898	0.896	0.922	0.920	0.585
Born in coastal province	0.417(0.493)	0.415 (0.492)	0.918	0.438	0.372	0.398	0.471	0.398	0.168
Resided in coastal province	0.444 (0.497)	0.439 (0.496)	0.753	0.474	0.358	0.413	0.512	0.420	0.017
Urban hukou prior to college	0.784 (0.412)	0.771 (0.420)	0.402	0.835	0.752	0.764	0.705	0.781	0.150
Religious	0.066 (0.248)	0.066 (0.249)	0.958	0.050	0.058	0.093	0.061	0.065	0.430
Member of CCP *[at baseline]*	0.068 (0.252)	0.064 (0.245)	0.660	0.058	0.044	0.066	0.057	0.076	0.549
Educational background	0.000 (1.000)	-0.028 (0.980)	0.441	0.086	-0.140	-0.112	0.157	-0.109	0.002
English ability	0.000 (1.000)	-0.023 (0.986)	0.512	0.008	-0.094	0.045	-0.089	-0.019	0.383
Oversea travel experiences	0.000 (1.000)	-0.029 (0.988)	0.416	0.208	-0.158	-0.048	-0.152	-0.035	0.284
Household characteristics	0.000 (1.000)	-0.018 (0.967)	0.604	0.010	-0.067	-0.077	0.068	-0.035	0.284
Risk preferences	0.000 (1.000)	-0.017 (1.008)	0.639	0.109	-0.011	0.031	-0.023	-0.101	0.381
Time preferences	0.000 (1.000)	-0.003 (0.995)	0.930	0.057	-0.018	-0.044	-0.025	0.004	0.939
Altruism	0.000 (1.000)	0.006 (0.995)	0.874	-0.012	0.011	-0.006	0.118	-0.041	0.223
Reciprocity	0.000 (1.000)	0.014 (1.007)	0.702	-0.071	0.246	-0.007	0.005	0.006	0.076
# of obs.	1807	1372	–	242	137	259	244	490	–

Notes: Mean level of each characteristics are reported in column 1 for all participants who have completed baseline survey in November 2015 (and corresponding standard deviation in parentheses), column 2 for participants who completed endline survey in April 2017 (and corresponding standard deviation in parentheses), column 4 for endline participants who use censorship circumvention tools prior to the baseline survey, column 5 for endline participants in the control group *(C)*, column 6 for endline participants in the control + encouragement group *(CE)*, column 7 for endline participants in the access group *(A)*, and column 8 for endline participants in the access + encouragement group *(AE)*. All characteristics in the "personal characteristics" (category F.1 in survey) are presented. Characteristics in "educational background" (category F.2), "English ability and oversea travel experiences [at baseline]" (category F.3), "household characteristics" (category F.4), and "fundamental preferences" (category F.5) are summarized by z-scores. For each characteristic, a t-test is conducted against the null hypothesis that students who have completed baseline survey and those who completed endline are not different from each other in term of this characteristic; column 3 reports the corresponding p-value for each test. For each characteristic, an ANOVA test is conducted against the null hypothesis that students in the control, control + encouragement, access, and access + encouragement groups are not jointly different from each other in term of this characteristic; column 9 reports the corresponding p-value for each test.

Table 2: Browsing activities on foreign websites

	Access		Access + Encour.		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value
	(1)	(2)	(3)	(4)	(5)
Panel A: *extensive margins (% of students), among all students*					
Activated accounts	54.6%	49.9%	68.2%	46.6%	<0.001
Active users	39.6%	49.0%	45.5%	49.8%	0.083
Panel B: *intensive margins (mins per day), among all students*					
Total daily browsing time	31.45	64.99	31.87	59.14	0.922
Google and related services	6.96	13.76	7.09	13.29	0.885
YouTube	3.64	8.79	4.46	11.44	0.263
Facebook	3.09	7.28	3.27	7.83	0.732
Twitter	2.79	7.29	2.96	7.70	0.742
Top foreign news websites	0.10	0.23	0.59	0.65	<0.001
New York Times	0.07	0.18	0.56	0.61	<0.001
Informational websites	2.98	5.84	3.17	5.51	0.612
Wikipedia	0.05	0.19	0.54	1.78	<0.001
Entertainment websites	9.07	15.42	8.90	14.53	0.871
Pornographic websites	2.44	8.13	2.52	8.74	0.898
Panel C: *intensive margins (mins per day), among active users*					
Total daily browsing time	79.17	83.13	69.59	71.20	0.232
Google and related services	17.50	17.16	15.22	16.31	0.198
YouTube	9.12	12.06	9.75	15.37	0.686
Facebook	7.74	9.92	7.14	10.36	0.587
Twitter	7.05	10.22	6.51	10.36	0.625
Top foreign news websites	0.25	0.30	1.19	0.43	<0.001
New York Times	0.18	0.25	1.13	0.38	<0.001
Informational websites	7.50	7.24	6.72	6.59	0.284
Wikipedia	0.14	0.29	1.19	2.48	<0.001
Entertainment websites	22.79	16.97	19.22	16.37	0.044
Pornographic websites	6.16	12.03	5.49	12.32	0.613

Note: Panel A shows the composition among students received only the access treatment (*Group-A*) and those who received both access and encouragement treatments (*Group-AE*). They are divided into 2 nested categories: *(i)* "activated accounts" — students who have activated the censorship circumvention tool provided during the experiment, as of April 10th, 2017 (the last day of the experiment); and *(ii)* "active users" — students who have activated the tool and were actively using the tool (if the student's account records at least one browsing activity per day for more than 40 days after the encouragement treatment ends). Panel B shows the average daily browsing time in total and on various categories of websites throughout the experiment after the encouragement treatment ends, among all students (assuming students without activated accounts spend 0 minute on these websites). Panel C replicates Panel B, but among students who actively used the tool. Top foreign news websites, informational, entertainment, and pornographic websites are defined primarily based on Alexa Top Websites categorization. Column 5 shows p-values of two-sided t-tests on the extensive margins and the intensive margins between the *Group-A* and *Group-AE* students.

Table 3: Treatment effects on knowledge, attitudes, beliefs, and behaviors

	A: Media-related behaviors, beliefs and attitudes	**B.** Knowledge	**C.** Economic beliefs	**D.** Political attitudes	**E.** Behaviors & planned behaviors
	(1)	(2)	(3)	(4)	(5)
Panel A: *Reduced form*					
Encouragement only *(CE)*	0.126	0.066	0.065	0.054	0.105
	[0.075]	[0.096]	[0.103]	[0.095]	[0.092]
Access only *(A)*	0.215	0.119	0.136	0.164	0.176
	[0.080]	[0.102]	[0.100]	[0.096]	[0.096]
Encouragement + Access *(AE)*	1.268	0.412	0.573	0.853	0.328
	[0.067]	[0.088]	[0.089]	[0.086]	[0.084]
	(1.232-)	*(0.371-)*	*(0.527-)*	*(0.819-)*	*(0.275-)*
	(1.298+)	*(0.446+)*	*(0.615+)*	*(0.895+)*	*(0.356+)*
Panel B: *Two-stage estimates*					
Active user of access tool	1.977	0.630	0.901	1.380	0.469
	[0.133]	[0.124]	[0.138]	[0.130]	[0.125]
Mean (all non-existing users)	-0.186	-0.108	-0.125	-0.139	-0.090
Std. dev. (all non-existing users)	0.959	0.982	0.997	0.955	0.947
Mean (control group)	-0.811	-0.327	-0.418	-0.556	-0.294
Std. dev. (control group)	0.681	0.896	0.923	0.906	0.850
Mean (existing users)	0.867	0.503	0.584	0.647	0.419
Std. dev. (existing users)	0.681	0.931	0.783	0.952	1.129

Notes: Survey outcomes in each of the A-E categories are summarized by an z-score index, weighting by the inverse covariance of the standardized variables, following Anderson (2008). Panel A shows regression coefficient estimates and robust standard errors of the Group-CE, Group-A, and Group-AE indicators, where Group-C is the omitted group. Treatment lower *(-)* and upper *(+)* bounds are calculated for the estimated Encouragement + Access treatment effects, following Lee (2009). Panel B shows two stage estimates where the we use Group-CE, Group-A, and Group-AE indicators to estimate a first stage on whether students are active users of access tool to browse uncensored internet, defined as those who have activated the tool and were actively using the tool (if the student's account records at least one browsing activity per day for more than 40 days after the encouragement treatment ends). Coefficients are estimated using 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).

Table 4: Estimation of social learning model

	Individual sensitive news events			
Direct learning rates:	lowest	median	highest	
Poli. sensitive news events:	Steel production reduction reaches target	Carrie Lam becomes HK Chief Executive	Foreign leaders involved in Panama Papers	*Overall percentage of quizzes correctly answered*
	(1)	(2)	(3)	(4)
Panel A: *Reduced form analyses*				
Access & active	0.094	0.185	0.332	0.204
	[0.056]	[0.061]	[0.040]	[0.022]
Roommate w/ access	0.023	0.047	0.222	0.076
	[0.056]	[0.062]	[0.040]	[0.022]
Access & active × Roommate w/ access	-0.001	0.002	-0.114	-0.032
	[0.071]	[0.078]	[0.052]	[0.028]
Panel B: *Implied social transmission rates*				
Transmission rate (receiver w/ access)	0.086	0.113	0.248	0.118
	[0.206]	[0.150]	[0.045]	[0.034]
Transmission rate (receiver w/o access)	0.084	0.117	0.121	0.069
	[0.167]	[0.124]	[0.038]	[0.027]
Panel C: *Predictions and out-of-sample tests*				
Actual: % correct (receiver w/o access)	0.188	0.328	0.918	0.614
Predicted: % correct (receiver w/o access)	0.225	0.317	0.955	0.589
	[0.070]	[0.071]	[0.053]	[0.028]
Actual: % correct (receiver w/ access)	0.314	0.490	1.000	0.743
Predicted: % correct (receiver w/ access)	0.317	0.505	1.000	0.733
	[0.076]	[0.081]	[0.018]	[0.025]

Notes: "Access & active" indicates whether students have access to uncensored Internet and actively browse its content; the indicator takes value 1 if the student is an existing user of the censorship circumvention tool prior to the baseline survey (November 2015), or is assigned with both the access and encouragement treatments (*Group-AE*). "Roommate w/ access" indicates whether there is one college dorm roommates who are actively use censorship circumvention tool as a result of the experimental treatment. "Overall percentage of quizzes correctly answered" aggregates all 11 news quizzes together, and use whether roommate receives access by the endline survey (April 2017) in the baseline specifications. Reduced form analyses and social transmission rates estimation are conducted among students who have completed the corresponding wave of the survey, have no roommates who were existing users of the censorship circumvention tool prior to the baseline survey, and have either 0 or 1 roommates who are actively use censorship circumvention tool as a result of the experimental treatment. Out-of-sample tests are conducted among students who have at least 2 roommates who are actively use censorship circumvention tool as a result of the experimental treatment; bootstrapped standard errors are shown in brackets. See Appendix H for more details.

ONLINE APPENDIX, NOT FOR PUBLICATION

The Impact of Media Censorship: 1984 or Brave New World?

Yuyu Chen and David Y. Yang

Appendix A Administrative & legal framework of Internet censorship

China was connected to the Internet on a permanent basis in 1994. Simultaneously with the Internet's arrival, the State Council of China initiated the process of its regulation. Specifically, the Council issued the "Regulations of the People's Republic of China for Safety Protection of Computer Information Systems" in 1994, and Article 7 of this set of regulations stipulates:[1]

> No organization or individual may make use of computer information systems to engage in activities harmful to the interests of the State or collectives, or the legitimate rights of the citizens, nor endanger the safety of computer information systems.

The 1994 regulations laid the groundwork of information control over China's cyberspace. The regulations specified that the State Council Information Office manages the implementation of information control across various mediums, and delegated the administrative responsibility of Internet censorship to the Ministry of Public Security, directly oversaw by the State Council and the Propaganda Department of the Chinese Communist Party. The Ministry of Public Security further amended the regulations by issuing the "Security Management Procedures in Internet Accessing" in 1997, specifying that "No unit or individual may use the Internet to create, replicate, retrieve, or transmit the following kinds of information: [...] *(ii)* inciting to overthrow the government or the socialist system; *(iii)* inciting division of the country, harming national unification; *(iv)* inciting hatred or discrimination among nationalities or harming the unity of the nationalities [...]"

In response to the beginning of foreign news outlets' operation in China and the upcoming WTO agreement, the "State Council Order No.292" issued in 2000 generated the first content restrictions for Internet content providers, particularly with respect to domestic media outlets hosting contents from foreign media outlets. The order prevents the domestic media outlets from hosting links to foreign news outlets, or distributing news from foreign news outlets without separate approval from the Internet regulatory bodies.

In 2013, a new, separate administration — the Cyberspace Administration of China — was created for the purpose of regulating Internet content and cyberspace. The administration is run by the Central Cybersecurity and Information Leading Small Group, chaired by the President of China. The administration intends to streamline the regulations of Internet across various bureaucratic bodies, and places the ultimate control directly under the president.

Overall, these administrative regulations and legal framework ensures that media outlets based in China would incur severe business and political cost from publishing and circulating contents that the state deems threatening and objectionable. As a result, contents on domestic media outlets are routinely censored and

[1] Source: `http://lawinfochina.com/display.aspx?lib=law&id=12136&CGid=`, last accessed on December 11, 2016.

filtered by the orders from the Propaganda Department (either *ex-ante* or *ex-post*), or self-censored during the editorial process.

Most recently, in late 2016 the People's Congress of China passed the new "Cybersecurity Law of the People's Republic of China," legalizing the state's control over information flows and technology equipment over China's cyberspace, further restricting the operation freedom of foreign media outlets' in China. The Cybersecurity Law is set to come into effect in June 2017 *(after this study concludes)*.

Responding to the passing of the Cybersecurity Law as well as the broad campaign to regulate Internet content in China, the Ministry of Industry and Information Technology issued "Regulations on Internet Connection Services" in January 2017.[2] While the statement is largely vague and a reiteration of existing policy and legal interpretations, Article 4 of Section 2 states that all connections to oversea servers (VPN is used as an explicit example) need to be registered with the telecommunication authorities in China. It is important to note that while this document takes the broad market of censorship circumvention tools (in particular, VPN services) out of the legal grey zone, it by no means outlaws the provision and the usage of such tools. In fact, this document establishes the legal status of censorship circumvention tool provides so long as they are properly registered, and even before this particular document was issued, there are plenty of legal, registered VPN providers in China, most of which are affiliated with state-owned enterprises.[3]

The new Cybersecurity Law and the Regulations on Internet Connection Services indicate that the Chinese state may begin to regulate the market of censorship circumvention tools more systematically in the near future. Since July 2017, Apple pulled down unregistered VPN mobile applications from its App Store, and Amazon issued tighter regulation in using its cloud service to establish VPN connections.[4] However, it is also important to note that similar "crackdown" on censorship circumvention tools took place previously, and they are often cyclical and temporary — the most recent one was in March 2016 in response to the Annual Meetings of the National People's Representatives.

A critical feature of the legal framework and regulations regarding Internet censorship is that they are almost exclusively concentrated on the Internet infrastructure, connection service providers, and content providers. In other words, there has been little regulations related to Internet censorship that explicitly target citizens (or, content consumers) themselves. In fact, while there have been judicial cases against citizens, often high profiled celebrities and journalists, leading to their arrests under the charges of "actively spreading illegal information or state secret," "inciting social unrest and social turbulence" or "disrupting social order,"[5] there exists no reported case of charges brought against Chinese Interent users because they privately consume contents on the websites blocked by the Great Firewall. Roberts (2018) argues that this is because imposing fear and deterrence among citizens themselves could often lead to backlashes:

> [D]espite government efforts to signal to the public the consequences of spreading sensitive information online, fear-based methods of censorship do not deter much of the large online population in China, which is accustomed to regularly reading about and discussing sensitive political information. Signals that particular information is off limits do not persuade online

[2]Source: `http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757020/c5471946/content.html`, last accessed on August 26, 2017.

[3]Source: `https://www.forbes.com/forbes/welcome/?toURL=https://www.forbes.com/sites/leonhardweese/2017/01/25/what-does-chinas-vpn-ban-really-mean`, last accessed on August 26, 2017.

[4]Source: on Apple, `https://www.nytimes.com/2017/07/29/technology/china-apple-censorhip.html`, last accessed on August 26, 2017; on Amazon, `https://www.nytimes.com/2017/08/01/business/amazon-china-Internet-censors-apple.html`, last accessed on August 26, 2017.

[5]Source: `https://www.amnestyusa.org/search/china/`, last accessed on August 26, 2017.

users to avoid the topic. In fact, for ordinary citizens who consume and produce political information online in China, experience with censorship and awareness of censorship negatively affects their opinion of the state and may even make them more likely to read and write about topics that are viewed by the state as more sensitive, as they are alerted to topics the Chinese government deems dangerous.

In fact, officials at the Propaganda Department and the Ministry of Public Security rarely publicly recognize the existence of the *Golden Shield Project* and the Great Firewall, making public and legal discussion of Great Firewall bypass tools impractical. Roberts (2018) documents that there is little perceived fear among Chinese citizens in terms of browsing politically sensitive information online. In particular, the usage censorship circumvention tools do not seem to carry a particular stigma or fear. For example, Hobbs and Roberts (2018) find that citizens in China reacted to the sudden access block of Instagram in September 2014 by using censorship circumvention tools in order to continue their access.

Appendix B Access treatment: details

B.1 Features of the censorship circumvention tool we provide

The premium censorship circumvention tool we offer provides fast, stable, and reliable access to Internet bypassing the Great Firewall, allowing students to visit websites that are otherwise blocked due to censorship, and to consume information uncensored and unfiltered by the Chinese state.

This particular tool features the following characteristics: *(i)* it combines Http proxy service with the VPN, which means that once the students have set up the tool on their devices, they no longer need to sign-on each time they browse the Internet — the tool is on and operating by default; *(ii)* the deep-tunnel technology ensures that the service is stable and robust, even during politically sensitive times when the Chinese government temporarily shut down certain VPN services; *(iii)* we aim to provide a frictionless experiences to students who wish to use the tool, for example, the setup requires less than 1 minute and we offer full technical support during the setup process and continuous customer services to troubleshot throughout the experiment; *(iv)* students would not experience noticeable speed reduction when browsing Internet through the tool — the tool automatically detects whether destination websites are hosted inside or outside of China, and it only turns on when traffic reaches outside of China; hence it would not affect the speed and experiences for browsing websites hosted domestically; and *(v)* the tool works on both students' computer and mobile device (e.g. smart phone).

B.2 Translated email script to students who receive the access treatment

Dear [name],

Thank you again for participating in the survey on "Beliefs, attitudes, preferences, and behaviors among Chinese colleges students in the age of globalization" last month.

We have already paid you the baseline participation fee for completing the survey via WeChat transfer. Please contact us immediately if you have not received the payment yet.

As we mentioned, we draw lottery winners among participants of the study. The prizes for this round of lottery are various media subscription services, such as Youku VIP account and annual services from *XYZ*.[6] **Congratulations! You have won the lottery prize — an 18-month subscription of the *XYZ* Internet service!**

XYZ is a professional and secure Internet service (worth RMB 150 per month) that allows you to browse Internet websites around the world without restrictions, access information in a speedy manner; and it is a service adopted by many business enterprises and professionals in China. You can follow the instruction below to activate the *ABC* service and start using it right away:

(1) Your personal account name: [username]

Initial password: [password] (you can change the password immediately after you log in)

(2) Open *XYZ*'s website: [url], type in your account name and initial password, read and consent to the user agreement, and this activates your account

[6] We conceal the actual name the censorship circumvention tool provider in order to protect the service. We replace its actual name with *XYZ* henceforth.

(3) Click the "setup instruction" on the left, follow the easy instructions to setup your computer and mobile devices
(4) Every account can simultaneously connect 2 personal devices (computer, tablets, and smart phones)

You can learn more about the *XYZ* service from its website ([url]). If you encounter any problems with setting up or using the service, you can contact the customer service personnel at *XYZ* directly: [email address of *XYZ* customer service].

If you have any problems or concerns with this survey, please do not hesitant to contact us at any time:
Email: [study email address]
WeChat: [study WeChat account]

We wish you enjoy the *XYZ* service! Thank you again for participating in our 1st wave of the online survey. We sincerely looking forward to seeing you again in the future waves of the survey!

Peking University, Guanghua School of Management
Stanford University, Department of Economics
December 2015

Appendix C Encouragement treatment: details

The encouragement treatment contains two main phases, which were sent to Group-CE and Group-AE students simultaneously.

Phase 1: introduce blocked news outlets & highlight divergent reporting across outlets The first phase of encouragement treatment does not involve monetary incentives. It introduces students to a variety of foreign websites that are blocked by the Great Firewall that students may never hear of. For example, we introduced the *New York Times* Chinese edition, the *Intium* (a Hong Kong based news outlet), *TED talks*, etc. For each website, we provide a brief description of the website's content, functionality, and reputation. In addition, we present sample contents that will link students directly to the websites; for example, top 5 articles from past week, most popular videos from past month, etc. Appendix Figure A.1 shows a screenshot of such newsletter.

In addition, some later newsletters highlights to students that politically sensitive news events are often reported differently between domestic news outlets and their foreign counterparts that are blocked by the Great Firewall. For example, regarding the stock market crash in January 2016, we present headline articles (and links) from, among others, the *New York Times* Chinese edition titled "Does China lose its ability to manage complicated economic affairs?", and from the *Financial Times* Chinese edition titled "Gatekeeper cannot handle the crisis, leading the Chinese economy astray." In particular, due to the Propaganda Department's order to censor negative reports on economic and in particular stock market performance, these headlines represent information that students would not be able to find from domestic news outlets (even if they think they have already informed themselves with the current economic news from these outlets).[7] Appendix Figure A.2 shows a screenshot of such newsletter.

Phase 2: news quizzes with monetary rewards The second phase of encouragement treatment involves news quizzes with monetary rewards. The goal of the quizzes is to encourage students to visit foreign news outlets blocked by the Great Firewall — the *New York Times* Chinese edition, in particular.[8] For example, on the day when the *New York Times* Chinese edition front page features an article on underground water pollution in China, we inform students that they should look for an article on the *New York Times* Chinese edition front page on that day that covers such topic, and we ask students: *(i)* what percentage of China's underground water is reported to be polluted? — this is meant to make the question looks like a regular quiz, and we design the question such that the answer is easy to spot as long as the students can locate the relevant article from the *New York Times*; *(ii)* who is the author of this article — this is meant to ensure that students need to go to the *New York Times* to read the original article, while search engine and re-posted version of the articles on other platforms typically would not include the author information; and *(iii)* what is the author's one other article on the *New York Times* published during the past week — this is meant to encourage students to browse the *New York Times* beyond the article that is related to the quiz. If students

[7] For example, according to leaked commands issued by the Propaganda Department, domestic news outlets are asked to organize and censor their economic news content to "highlight the optimistic outlook of the Chinese economy" (September 8, 2015), and should not report on the resignation of the National Stock Market Supervision Council chair in response to the stock market crash in January (February 18, 2016). Source: the *China Digital Times* hosted by the Berkeley Counter-Power Lab.

[8] We focus exclusively on the *New York Times* in order to maximize the power of this encouragement treatment in terms of leading to changes in students' news consumption, without diffusing students to multiple outlets.

can answer all three questions correctly (via replying to email or message on WeChat), we pay the students with US$ 2.5.

The quizzes carry out for a total of 4 rounds.[9] Other questions cover topics including wealth inequality in China, the censorship on economic indicators, and labor unrest.[10] We list each of the quiz question (excluding the questions on article author and related articles) and corresponding news article on the *New York Times* below. Appendix Figure A.3 shows a screenshot of this type of newsletter.

1. The top 1% Chinese families in terms of income own _____% of the wealth in China; the bottom 25% of the Chinese families in terms of income own _____% of the wealth in China?

    - Corresponding article: "*Studies Point to Inequalities That Could Strain Chinese Society*" by Chris Buckley.

2. Since last September, the Markit Economics (UK) and Caixin (Beijing) terminated the _____ index that they have been publishing every month?

    - Corresponding article: "*As China's Economic Picture Turns Uglier, Beijing Applies Airbrush*" by Anwei Huang and Neil Gough.

3. During January 2016, there were _____ incidents of labor disputes and protests happened around China?

    - Corresponding article: "*Labor Protests Multiply in China as Economy Slows, Worrying Leaders*" by Javier C. Hernandez.

4. According to the article, _____ companies control at least _____% of Anbang's ownership.

    - Corresponding article: "*The Hidden Empire of Wealth of Anbang: Packed with the Rich and Powerful, Filled with Branches of Opaque Ownership*" by Michael Forsythe.

5. According to the article, _____% of the tested underground water in China is level 4 polluted, and _____% is level 5 polluted.

    - Corresponding article: "*Rural Water, Not City Smog, May Be China's Pollution Nightmare*" by Chris Buckley and Vanessa Piao.

[9] The first round of the quiz features news that is *not* strictly censored on the domestic media. We intentionally make this design choice, in order to minimize the political sensitivity upfront when students are paid by the researchers to consume particular news content. We also did not ask students about the author and other articles in the first quiz, for the same reason.

[10] All quiz questions are chosen to cover news content related to China and that are somewhat negative. We make this design choice in order maximize the encouragement treatment's ability to highlight content that students would be potentially interested, and are otherwise difficult to obtain from browsing domestic news outlets alone.

Appendix D Outcomes elicited in panel survey

Our repeated panel survey measures 5 broad groups of outcomes of interest, as well as a rich set of demographics and background characteristics that serve as both controls and criteria for heterogeneity analyses. We now describe each group of the survey outcomes, and present the original wording (translated) on *all* questions that we ask in the panel survey, with the category numbers labeled correspondingly.

Media-related behaviors, beliefs, and attitudes (A)

Given the critical role that beliefs regarding media outlets played in the framework we present in Appendix F, we explicitly measure participants' attitudes and beliefs regarding media and censorship across a wide range of domains.

Information source and media consumption (A.1) We first ask participants a set of questions related to their information sources an media consumption. We ask participants to rank media outlets/sources in terms of how important are they for the participants to obtain information (among domestic websites, foreign websites, domestic social media, foreign social media, and word of mouth). We next ask students to self-report their frequency to visit foreign websites, which would serve as an important benchmark for us to calibrate foreign media consumption among those participants who we do not observe online activities directly.

Purchase of censorship circumvention tools (A.2) Right before the endline survey in April 2017, we terminate the free subscription of censorship circumvention tool for students in the Group-A and Group-AE. We offered a discounted price for students in the Group-A and Group-AE to renew the subscription, and for Group-N, Group-NE, and existing users to purchase a new account at the same price. We record the students who actually renew or purchase the tool, and we also ask students if they plan to purchase any other (potentially cheaper) censorship circumvention tool if they choose not to purchase the tool that we provided.

Valuation of access to foreign media outlets (A.3) We elicit participants' valuation of access of foreign media outlets in two different ways. First, we ask participants to what extent they think it is valuable to read the report on the same news event on foreign news outlet after having already read it on domestic news outlet. Second, we use a Becker-DeGroot-Marschak (BDM) method to elicit participants' willingness to pay for one month's service of censorship circumvention tool, in an incentive-compatible manner.[11]

Trust in media outlets (A.4) Next, we elicit participants' level of trust towards three types of news outlets: *(i)* domestic media outlets owned by the state (e.g. the *People's Daily*); *(ii)* domestic media outlets privately owned (e.g. the *Southern Weekend*); and *(iii)* foreign media outlets (e.g. the *New York Times*).

[11] We incentivize the valuation decisions in the following way. For every 100 participants of this study, we randomly pick one item in the BDM elicitation module to implement. For participants assigned with the access treatment, we override their choice with free provision of the censorship circumvention tool, in the case in the decision item that we pick to implement they choose cash payment over censorship circumvention tool.

Belief of actual level of media censorship (A.5) We ask participants to what extent do they think domestic news outlets and foreign news outlets censor their news reports, respectively.

Justification of media censorship (A.6) We ask participants to what extent do they think it is justifiable to for domestic media outlets to censor: *(i)* economic news; *(ii)* political news; *(iii)* social news (in particular suicides, etc.); *(iv)* news related to foreign affairs; and *(v)* pornographic materials.

Belief regarding drivers of media censorship (A.7) Finally, we ask students what do they think is the main driver of news censorship: government policy, media company's business interest, media company's own ideology, or readers' demand.

Calibration of news outlets' level of censorship (A.8) We next ask participants to calibrate, hypothetically, whether domestic and foreign news outlets would censor different types of news if they take place. Same as in *A.1*, the type of news spans the entire domain: positive news occurred in China, positive news occurred in the US, as well as their negative counterparts.

Calibration of news outlets' bias (A.9) We ask participants to calibrate, hypothetically, to what extent domestic and foreign news outlets would report different types of news in biased manner relative to truth, respectively. The type of news spans the entire domain: positive news occurred in China, positive news occurred in the US, as well as their negative counterparts.

Note: B - included in baseline survey (November 2015); M - included in midline survey (May 2016); E - included in endline survey (April 2017).

Panel A: Media-related behaviors, beliefs, and attitudes

Category A.1: *Information source and media consumption*		
A.1.1-5		To you, what do you depend on the most in order to keep yourself well-informed about news events and important information? Please rank the following sources of information, in terms of their importance to you personally. (1 = ranked bottom among five options; 5 = ranked top among five options)
A.1.1	B, M, E	domestic websites
A.1.2	B, M, E	foreign websites
A.1.3	B, M, E	domestic social media
A.1.4	M, E	foreign social media
A.1.5	B, M, E	talking with friends or classmates (direct word of mouth)
A.1.6	B, M, E	How often do you read news and other important information from foreign websites? (1 = never; 2 = every month; 3 = every week; 4 = every other day; 5 = every day; 6 = multiple times a day)
Category A.2: *Purchase of censorship circumvention tools*		
A.2.1	E	*[For students received supply-treatment:]* The free Internet service tool that you won during the lottery after our first round of survey in November 2015 has expired. If you wish, you can purchase and renew the service at a discounted price. Which service package would you like to purchase? (1 = seasonal package (total RMB 90, i.e. RMB 30/month); 2 = half-year package (total RMB 160, i.e. RMB 27/month); 3 = full-year package (total RMB 300, i.e. RMB 25/month); 4 = would purchase other VPN or http proxy service; 5 = will not purchase any service)

Continued on next page

		[For students not received supply-treatment:] [name of censorship circumvention tool provider; concealed for IRB restriction] provides stable and high quality VPN and http proxy service; you can check out the details of its service at [provider's official website]. It offers the following service packages at a discounted price. Which service package would you like to purchase? (1 = seasonal package (total RMB 90, i.e. RMB 30/month); 2 = half-year package (total RMB 160, i.e. RMB 27/month); 3 = full-year package (total RMB 300, i.e. RMB 25/month); 4 = would purchase other VPN or http proxy service; 5 = will not purchase any service)
A.2.2	E	Have *actually* paid for service from the [name of censorship circumvention tool provider; concealed for IRB restriction], directly observed from the provider's server.
Category A.3: *Valuation of access to foreign media outlets*		
A.3.1	B, M, E	Willingness to pay elicited using Becker-DeGroot-Marschak (BDM) method *[incentive-compatible]* (which of the following two options do you prefer: one month subscription of a VPN product that allows you to access all foreign websites; or the amount of RMB xxx as a sure payment?)
A.3.2	B, M, E	Suppose you have already read about a particular piece of news from domestic news outlet that is privately owned (e.g. Xinjin Paper; Caijin; Southern Weekend). How much extra information will you learn if you read news stories from the foreign news outlet (e.g. New York Times; Wall Street Journal; Financial Times) in addition? (0 = no extra information will be learned; 10 = I will learn almost everything from the foreign news outlet)
Category A.4: *Trust in media outlets*		
A.4.1-3		How much do you trust the following types of news outlets?
A.4.1	B, M, E	domestic news outlets owned by the state (e.g. People's Daily; Sunshine Times) (0 = completely trust; 10 = completely no trust)
A.4.2	B, M, E	domestic news outlets privately owned (e.g. Xinjin Paper; Caijin; Southern Weekend) (0 = completely trust; 10 = completely no trust)
A.4.3	B, M, E	foreign news outlets (e.g. New York Times; Wall Street Journal; Financial Times) (0 = completely no trust; 10 = complete trust)
Category A.5: *Belief regarding level of actual media censorship*		
A.5.1	B, M, E	To what extent do you think the information published on domestic news outlets is censored overall? (0 = completely uncensored; 5 = censored to some extent; 10 = completely censored)
A.5.2	B, M, E	To what extent do you think the information published on foreign news outlets is censored overall? (0 = completely uncensored; 5 = censored to some extent; 10 = completely censored)
Category A.6: *Justification of media censorship*		
A.6.1-5		To what extent do you think the following media censorship practices are justified? (0 = completely justified; 10 = completely unjustified)
A.6.1	B, M, E	impose censorship on reporting domestic economic news (e.g. potential economic slowdown; stock market pessimism; bankruptcy among small exporters).
A.6.2	B, M, E	impose censorship on reporting domestic political news (e.g. corruption scandal, political connections of businesses).
A.6.3	B, M, E	impose censorship on reporting domestic social news (e.g. environmental pollution, terrorism attacks, suicidal incidents).
A.6.4	B, M, E	impose censorship on reporting foreign news (e.g. economic recovery of the US, free trade agreements among EU nations).
A.6.5	B, M, E	impose censorship on pornographic information/entertainment (e.g. adult entertainment website).
Category A.7: *Belief regarding drivers of media censorship*		

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A.7.1-4		What do you think is the primary reason for domestic news outlets to censor their content and selectively report news events? Please rank the following factors in terms of their importance (1 = indicator for ranked as top).
A.7.1	B, M, E	government policies
A.7.2	B, M, E	commercial interest of the corporate
A.7.3	B, M, E	media company's own ideological preferences
A.7.4	B, M, E	readers' demand
A.7.5-8		What do you think is the primary reason for foreign news outlets to censor their content and selectively report news events? Please rank the following factors in terms of their importance (1 = indicator for ranked as top).
A.7.5	B, M, E	government policies
A.7.6	B, M, E	commercial interest of the corporate
A.7.7	B, M, E	media company's own ideological preferences
A.7.8	B, M, E	readers' demand

Category A.8: *Calibration of news outlets' level of censorship*

A.8.1	B, M	Suppose a major event happened in China that induced social and economic unrest. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report this particular event? (0 = report; 1 = not report at all)
A.8.2	B, M	Suppose a major event happened in China that is instrumental in boosting its socioeconomic development. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report this particular event? (0 = report; 1 = not report at all)
A.8.3	B, M	Suppose a major event happened in the US that induced social and economic unrest. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report this particular event? (0 = report; 1 = not report at all)
A.8.4	B, M	Suppose a major event happened in the US that is instrumental in boosting its socioeconomic development. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report this particular event? (0 = report; 1 = not report at all)
A.8.5	B, M	Suppose a major event happened in China that induced social and economic unrest. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report this particular event? (0 = report; 1 = not report at all)
A.8.6	B, M	Suppose a major event happened in China that is instrumental in boosting its socioeconomic development. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report this particular event? (0 = report; 1 = not report at all)
A.8.7	B, M	Suppose a major event happened in the US that induced social and economic unrest. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report this particular event? (0 = report; 1 = not report at all)
A.8.8	B, M	Suppose a major event happened in the US that is instrumental in boosting its socioeconomic development. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report this particular event? (0 = report; 1 = not report at all)

Category A.9: *Calibration of news outlets' bias*

A.9.1	B, M	Suppose a major event happened in China that induced social and economic unrest. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report, if at all, this particular event? (1 = report very positively (opposite of reality); 6 = report very negatively (aligned with reality))
A.9.2	B, M	Suppose a major event happened in China that is instrumental in boosting its socioeconomic development. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report, if at all, this particular event? (1 = report very negatively (opposite of reality); 6 = report very positively (aligned with reality))

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A.9.3	B, M	Suppose a major event happened in the US that induced social and economic unrest. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report this particular event? (1 = report very positively (opposite of reality); 6 = report very negatively (aligned with reality))
A.9.4	B, M	Suppose a major event happened in the US that is instrumental in boosting its socioeconomic development. How do you think the Chinese media outlet (e.g. People's Daily, Xinjing Paper) would report this particular event? (1 = report very negatively (opposite of reality); 6 = report very positively (aligned with reality))
A.9.5	B, M	Suppose a major event happened in China that induced social and economic unrest. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report, if at all, this particular event? (1 = report very positively (opposite of reality); 6 = report very negatively (aligned with reality))
A.9.6	B, M	Suppose a major event happened in China that is instrumental in boosting its socioeconomic development. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report, if at all, this particular event? (1 = report very negatively (opposite of reality); 6 = report very positively (aligned with reality))
A.9.7	B, M	Suppose a major event happened in the US that induced social and economic unrest. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report this particular event? (1 = report very positively (opposite of reality); 6 = report very negatively (aligned with reality))
A.9.8	B, M	Suppose a major event happened in the US that is instrumental in boosting its socioeconomic development. How do you think the US media outlet (e.g. New York Times; Wall Street Journal) would report this particular event? (1 = report very negatively (opposite of reality); 6 = report very positively (aligned with reality))

Knowledge (B)

The next broad category of outcomes that we measure is students' knowledge, we we aim to cover a wide range of dimensions, both contemporary and historical, both politically sensitive and non-sensitive.

Current news events covered in encouragement treatment (B.1) We first ask participants quiz questions on news events that are directly covered in the encouragement treatment (in particular, the quizzes with monetary incentives). There are 4 such questions in total, and these quizzes are in the format of "true or false" regarding a statement describing the news event, and although the cover the same news events as the quizzes in the encouragement treatment, they do not resemble each other exactly. Note that B.1 items are the *only* questions in the entire survey that directly correspond to materials covered in the encouragement treatment — all other survey questions are not explicitly mentioned in the encouragement treatment. We code each outcome variable as indicator of 1 if the students answer the corresponding "true or false" quiz correctly.

Current news events *not* covered in encouragement treatment (B.2) We next ask participants 7 quiz questions on news events that are not covered in the encouragement treatment. These questions fall into 2 sub-categories: *(i)* 4 of them correspond to news events that are censored on domestic news outlets (e.g. the Panama Papers, and the film on Hong Kong independence that won the Best Picture in 2015 Hong Kong Film Festival); and *(ii)* 3 of them correspond to news evens that are not politically sensitive and hence

are not censored on domestic news outlets (e.g. the Apple vs. FBI case, and the Taiwanese presidential election).[12] Same as the previous category, we code each outcome variable as indicator of 1 if the students answer the corresponding "true or false" quiz correctly.

Awareness of protests and independence movements (B.3) We then ask participants whether they have heard of several protest events that took place during the last decade. There are 9 of them in total. Given that protest events are in general very politically sensitive, all these events are censored on the domestic media outlets. They fall into 3 sub-categories: *(i)* protests took place in the Greater China region (e.g. the Umbrella Revolution in Hong Kong); *(ii)* protests took place around the world (e.g. the Arab Spring); and *(iii)* a fake protest that we make up as a placebo in order to see whether participants are randomly clicking in this module.

Awareness of notable figures (B.4) We next ask participants whether they have heard of a range of notable figures in mainland China or Great China region. There are 10 of them in total, and they fall into 4 sub-categories: *(i)* politically sensitive notable figures are featured in recent news events since the baseline survey in November 2015 (e.g. Zhiqiang Pu, Joshua Wong); *(ii)* politically sensitive notable figures are not featured in recent news events (e.g. Xiaolin Li); *(iii)* notable figures who are not politically sensitive and are not censored on the domestic media outlets (e.g. Yushi Mao); and *(iv)* fake names that we randomly picked as a placebo in order to see whether participants are randomly clicking in this module.

Assessment of one's own knowledge (B.5) Finally, we measure students' assessment of their own knowledge by asking students to assess their familiarity with political events, both with respect to oneself, and in comparison with other students at the university.

Panel B: Knowledge

Category B.1: *Current news events covered in the encouragement treatment*		
B.1.1-4		Many events took place in China during the past 2 months. Below is a list of some of the events. Some actually happened, and some did not. For each event, please tell us if you think it happened or not. (0 = answered incorrectly; 1 = answered correctly)
B.1.1	M	According to the latest survey, the top 1% families in China who earn the most own less than 10% of the domestic wealth.
B.1.2	M	Since September 2015, Beijing Caixin Media has terminated its monthly publication of the China Purchase Management Index (PMI) index.
B.1.3	M	During January 2016, there are more than 500 cases of labor disputes, unrest, and protests throughout China.
B.1.4	M	According to the latest study, water quality in more than half of the wells in China has met or exceeded the international standard of excellence.
Category B.2: *Current news events not covered in the encouragement treatment*		
B.2.1-26		Many events took place in China during the past 2 months. Below is a list of some of the events. Some actually happened, and some did not. For each event, please tell us if you think it happened or not. (0 = answered incorrectly; 1 = answered correctly)

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[12] Questions in B.1 and B.2 are not repeated in the panel survey. Instead, each wave of the survey will cover new questions reflecting the news events that take place since the last wave of the survey. Other knowledge questions are repeatedly asked across the panel waves.

B.2.1	B	The Shanghai Stock Exchange Index unprecedentedly dropped by 16% within 3 days. *[censored]*
B.2.2	B	The tarns-continental railways across Brazil and Peru, invested by China, has been successfully constructed and begun operation. *[censored]*
B.2.3	B	The Kuomintang candidate Lilun Zhu claimed an overwhelming lead over his competitors in the polls of the Taiwanese Presidential Election in dominance. *[censored]*
B.2.4	B	President Xi visited the US, and reached a strategic cooperation agreement with the US regarding Internet policies. *[censored]*
B.2.5	M	The documents leaked from the offshore financial and legal firm in Panama involved 143 politicians around the world, including the ones from Russia, Argentina, and Iceland. *[censored]*
B.2.6	M	The Best Picture winner of the 2016 Hong Kong Film Festival is "Ten Years," which depicts authoritarian Hong Kong in year 2025. *[censored]*
B.2.7	M	After the New Year Eve in 2016, the "trigger and break mechanism" introduced by the former China Securities Regulatory Commission head Xiao Gang led to the dramatic turbulence of the Chinese stock market. *[censored]*
B.2.8	M	Since April 2016, the English magazine "Economist" terminates its publication and distribution in China due to loss of profit. *[censored]*
B.2.9	E	According to latest "Green Peace" report, China has achieved the full year's steel production reduction target in 2016, which lessens the severity air pollution across the country. *[censored]*
B.2.10	E	During the 2016 US Presidential Election, the Trump Group registered a large number of trademarks regarding design, restaurant, and hotel business in China. *[censored]*
B.2.11	E	Jianhua Xiao, a billionaire residing in Hong Kong was kidnapped by local gangs during the 2017 Chinese New Year. *[censored]*
B.2.12	E	Starting from February 2016, the Xinjiang local government started to install GPS system on all automobiles in the region, in order to foster research and development in automated driving technology. *[censored]*
B.2.13	E	After a frozen period of 6 years, China and Norway has re-normalized their diplomatic ties, which led to the revival of Norwegian salmon industry. *[censored]*
B.2.14	E	During the last few months, the feminist groups in China has been promoting the protection of women's right, and they have received warm attention and support from local government and relevant institutions. *[censored]*
B.2.15	E	In March 2017, Carrie Lam, the former Chief Secretary for Administration won the election for Chief Executive of Hong Kong; Carrie is the candidate who receives the highest support from the Hong Kong population. *[censored]*
B.2.16	B	The People's Bank led measures to significantly depreciate RMB against US dollars, in order to stimulate export. *[uncensored]*
B.2.17	B	China announced to downsize its military by 300,000 at the 70th Anniversary of Sino-Japanese War military parade. *[uncensored]*
B.2.18	B	Li Ka-shing expanded his business investments in Mainland China. *[uncensored]*
B.2.19	B	The Nanking Massacre has been selected to the UNESCO "World Memory" list. *[uncensored]*
B.2.20	M	Apple Inc. actively assisted the FBI in the US to unlock the iPhone owned by the suspect of the 2015 San Bernardino shooting. *[uncensored]*
B.2.21	M	Tsai Ing-wen from the Democratic Progressive Party won the Taiwan presidential election in 2016. The Kuomintang still maintains control of the Legislative Yuan of Taiwan. *[uncensored]*
B.2.22	M	The actual cause of the April 2016 Beijing Yihe hotel attack incidence is the business conflicts among various prostitution groups in Beijing. *[uncensored]*
B.2.23	E	Since February 2017, China terminated importing coal from North Korea; China is the most important export destination for coal production in North Korea. *[uncensored]*
B.2.24	E	The worst H7N9 influenza epidemic in 4 years broke out in China at the beginning of 2017; 79 patients dead in January alone. *[uncensored]*
B.2.25	E	The transnational railway in Ethiopia, invested and constructed by China, made its inaugural run in 2017; this is the only railway project China has invested in Africa. *[uncensored]*
B.2.26	E	The foreign reserves held by China reached record high in the beginning of 2017, which grew beyond the US$ 4 trillion threshold. *[uncensored]*

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Category B.3: *Awareness of protests and independence movements*		
B.3.1-10		Following are a list of events that took place around the world during the past 5 years. For each of these events, please indicate whether you have heard of it before?
B.3.1	B, M, E	2012 Hong Kong Anti-National Curriculum Movement
B.3.2	B, M, E	2014 Hong Kong Umbrella Revolution
B.3.3	M, E	2016 Hong Kong Mong Kok Fishball Revolution
B.3.4	B, M, E	2014 Taiwan Sunflower Student Movement
B.3.5	B, M, E	2014 Ukrainian Euromaidan Revolution
B.3.6	B, M, E	2010 Arab Spring
B.3.7	B, M, E	2014 Crimean Status Referendum
B.3.8	B, M, E	2010 Catalonian Independence Movement
B.3.9	E	2017 Women's March around the world
B.3.10	B, M, E	2011 Tomorrow Movement *[fake]*
Category B.4: *Awareness of notable figures*		
B.4.1-10		Following are a list of notable figures in China. For each of these names, please indicate whether you have heard of him/her before? (0 = no; 1 = yes)
B.4.1	B, M	Zhiqiang Pu *[sensitive, featured in recent news]*
B.4.2	B, M	Zhiqiang Ren *[sensitive, featured in recent news]*
B.4.3	B, M	Joshua Wong *[sensitive, featured in recent news]*
B.4.4	B, M	Zehou Li *[sensitive, not featured in recent news]*
B.4.5	B, M	Guangcheng Cheng *[sensitive, not featured in recent news]*
B.4.6	B, M	Xiaolin Li *[sensitive, not featured in recent news]*
B.4.7	B, M	Yushi Mao *[non-sensitive]*
B.4.8	B, M	Huang Hong *[non-sensitive]*
B.4.9	B, M	Qiangdong Liu *[non-sensitive]*
B.4.10	B, M	Lequn Jia *[fake]*
Category B.5: *Self-assessment of knowledge level*		
B.5.1	B, M, E	How would you rate your own informedness of important political and socioeconomic issues facing China today? (0 = I am completely ignorant about these issues; 10 = I am extremely well informed about these issues)
B.5.2	B, M, E	How would you compare yourself to most other students in your university in terms of your informedness of important political and socioeconomic issues facing China today? (0 = they are extremely more informed than me; 5 = they are about the same as me; 10 = they are extremely less informed compared to me)

Economic beliefs (C)

We next elicit participants economic beliefs in an incentive-compatible manner, and their corresponding confidence with respect to their beliefs.

Belief on economic performance in China (C.1) We first elicit participants' beliefs on economic performance in China in 2016 (baseline wave) and 2017 (midline and endline wave). In particular, we ask participants to guess the GDP growth rate in China during 2016 (baseline wave) and 2017 (midline and endline wave), and the Shanghai Stock Composite Index (SSCI) — the main stock market index in China — as of December 31, 2016 (baseline wave), and December 31, 2017 (midline and endline wave). Participants will

be rewarded with a bonus of RMB 5 if their GDP growth rate guess is within 0.1 percentage point of the truth, and an additional bonus of RMB 5 if their SHI guess is within 5% window of the truth.

Confidence on guesses regarding economic performance in China (C.2) We next ask participants to evaluate their own confidence regarding the guess they just submitted with respect to the GDP growth rate in China and the stock market performance in the Shanghai Stock Composite Index, respectively.

Belief on economic performance in the US (C.3) We then elicit participants' beliefs on the economic performance in the US in 2016 (baseline wave) and 2017 (midline and endline wave). In particular, we ask participants to guess the GDP growth rate in the US during 2016 (baseline wave) and 2017 (midline and endline wave), and the Dow Jones Index (DJI) as of December 31, 2016 (baseline wave), and December 31, 2017 (midline and endline wave). Participants will be rewarded with a bonus of RMB 5 if their GDP growth rate guess is within 0.1 percentage point of the truth, and an additional bonus of RMB 5 if their DJI guess is within 5% window of the truth.

Confidence on guesses regarding economic performance in the US (C.4) Lastly, we ask participants to evaluate their own confidence regarding the guess they just submitted with respect to the GDP growth rate in the US and the stock market performance in the Dow Jones Index, respectively.

Panel C: Economic beliefs

Category C.1: *Belief on economic performance in China*		
C.1.1	B, M, E	What do you think will China's GDP growth rate be during the entire year of [2016 *(B,M)* or 2017 *(E)*]? If your guess is within 0.1% of what will be announced by China's Statistics Bureau after [2016 *(B,M)* or 2017 *(E)*], then you will earn a bonus payment of RMB 5.
C.1.2	B, M, E	What do you think will the Shanghai Stock Composite Index (SSCI) be by the end of December 31st, [2016 *(B,M)* or 2017 *(E)*]? If your guess is within 5% of what the closing level of the Shanghai Stock Composite Index will be on the December 31st, [2016 *(B,M)* or 2017 *(E)*], then you will earn a bonus payment of RMB 5. To help you better predict, note that the closing level of Shanghai Composite Index on [April 30th, 2016 is 2991 *(M)* or March 31st, 2017 is 3223 *(E)*].
Category C.2: *Confidence on guesses regarding economic performance in China*		
C.2.1	B, M, E	How certain are you regarding your guess on China's GDP growth rate? (0 = completely uncertain; 5 = somewhat certain; 10 = completely certain)
C.2.2	B, M, E	How certain are you regarding your guess on the Shanghai Stock Composite Index? (0 = completely uncertain; 5 = somewhat certain; 10 = completely certain)
Category C.3: *Belief on economic performance in the US*		
C.3.1	M, E	What do you think will USA's GDP growth rate be during the entire year of [2016 *(B,M)* or 2017 *(E)*]? If your guess is within 0.1% of what will be announced by the US Department of Commerce after [2016 *(B,M)* or 2017 *(E)*], then you will earn a bonus payment of RMB 5.
C.3.2	M, E	What do you think will the Dow Jones Index (DJI) be by the end of December 31st, [2016 *(B,M)* or 2017 *(E)*]? If your guess is within 5% of what the closing level of the Dow Jones Index will be on December 31st, [2016 *(B,M)* or 2017 *(E)*], then you will earn a bonus payment of RMB 5. To help you better predict, note that the closing level of the Dow Jones Index on [April 30th, 2016 is 17651 *(M)* or March 31st, 2017 is 20663 *(E)*].

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Category C.4: *Confidence on guesses regarding economic performance in the US*		
C.4.1	M, E	How certain are you regarding your guess on USA's GDP growth rate? (0 = completely uncertain; 5 = somewhat certain; 10 = completely certain)
C.4.2	M, E	How certain are you regarding your guess on the Dow Jones Index? (0 = completely uncertain; 5 = somewhat certain; 10 = completely certain)

Political attitudes (D)

We then measure a wide range of attitudes that the study participants hold with respect to politics, broadly defined. We believe that this is one of the most comprehensive political attitudes survey module that is ever conducted among citizens in China.

Demand for institutional change (D.1) We next ask participants to what extent do they think that the economic and political institutions need fundamental changes in the near future.

Trust in institutions (D.2) We next ask participants whether they trust a variety of institutions: *(i)* central, provincial, and local government of China; *(ii)* foreign government (Japan and the US); *(iii)* domestic and foreign financial institutions (e.g. banks); *(iv)* NGOs; and *(v)* court and police in China.

Evaluation of government's performance (D.3) We next measure participants' evaluation of Chinese government's performance in the past year, across the domain of: *(i)* economic affairs; *(ii)* political affairs; and *(iii)* foreign and diplomatic affairs.

Performance evaluation criteria (D.4) Related to D.4, we ask participants which are the most important criteria when they evaluate Chinese government's overall performance. Specifically, participants are asked to rank the following criteria: *(i)* electing state leaders through democratic elections; *(ii)* maintaining economic performance; *(iii)* promoting socioeconomic equality; *(iv)* maintaining the rule of law; *(v)* protecting human rights; *(vi)* respecting the freedom of speech; *(vii)* promoting China as a global power; and *(viii)* providing fairness to historical injustices.

Evaluation of severity of socioeconomic issues (D.5) We then measure participants' evaluation of to what extent certain socioeconomic issue is a severe problem in China today. This captures a combination of the participants' policy evaluation and their policy preferences. We ask participants to evaluate a total of 6 socioeconomic issues: *(i)* social welfare; *(ii)* unemployment; *(iii)* pollution; *(iv)* inequality; *(v)* corruption; and *(vi)* discrimination against ethnic minorities.

Evaluation of democracy and human rights protection in China (D.6) We next ask a set of questions concerning participants' evaluation of current status of democracy and human rights protection in China. For example, to what extent do participants consider the Chinese government cares for the interests of the masses (instead of the rich and powerful); what is the level of democracy in China today; what is the level of human rights protection in China today; and how important it is to live in a democratic society.

Justification of controversial policies and issues (D.7) We next ask participants whether certain policy or issue that is regarded as controversial is justified. We cover a total of 16 dimensions, and they fall into 2 sub-categories, broadly speaking: *(i)* controversial policies currently implemented by the Chinese government (e.g. one-child policy, and government's use of violence to achieve social stability); and *(ii)* controversial issues that are typically considered as liberal (e.g. legalization of homosexual marriage, and the legalization of soft drug usage).

Willingness to act (D.8) We next ask participants to what extent are they willing to act, hypothetically, in order to: *(i)* battle illegal acts conducted by the Chinese government; *(ii)* report government misconduct; and *(iii)* stand up to protect the interest of the weak.

Interest in politics and economics (D.9) We first ask participants to assess their own interests in political events as well as economic events, separately.

National identity (D.10) We next measure participants' national identity by asking them to what extent are they proud of being Chinese.

Fear to criticize the government (D.11) Lastly, we ask participants to what extent do they fear of criticizing the Chinese government (in terms of its policy or its behaviors).

Panel D: Political attitudes

Category D.1: *Demand for institutional change*		
D.1.1	B, M, E	What is your assessment of China's current economic system? (0 = it is working great, and should be maintained as it is now; 10 = China's economic system needs fundamental changes)
D.1.2	B, M, E	What is your assessment of China's current political system? (0 = it is working great, and should be maintained as it is now; 10 = China's political system needs fundamental changes)
Category D.2: *Trust in institutions*		
D.2.1-10		How much do you trust the following institutional bodies? (0 = completely no trust; 10 = complete trust)
D.2.1	B, M, E	central government of China
D.2.2	B, M, E	provincial government of China
D.2.3	B, M, E	local government of China (below provincial level)
D.2.4	B, M	court
D.2.5	B, M	police
D.2.6	B, M	domestic financial institutions (banks, etc.)
D.2.7	B, M, E	central government of Japan
D.2.8	B, M, E	federal government of the USA
D.2.9	B, M	foreign investors and financial institutions
D.2.10	B, M	NGOs
Category D.3: *Evaluation of government's performance*		

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D.3.1-3		How would you evaluate the Chinese government's performance in the following areas during the past 6 months? (0 = very unsatisfactory – performed way below my expectations; 5 = neutral – about the level of what I expected; 10 = very satisfactory – performed way exceeding my expectations)
D.3.1	B, M, E	economic development
D.3.2	B, M, E	domestic politics
D.3.3	B, M, E	international and diplomatic affairs
Category D.4: *Performance evaluation criteria*		
D.4.1-8		We list below eight aspects of modern and developed society. Which of them should Chinese citizens place greater emphasis on when they evaluate the government's overall performance? The more important an aspect is to citizens' evaluation of the government's performance, the higher points you should allocate to it (out of 100; standardized as scale from 0 to 1).
D.4.1	B, M	leaders are chosen by the people in universal suffrage.
D.4.2	B, M	civil and human rights are protected and well respected.
D.4.3	B, M	the economy is prospering.
D.4.4	B, M	the state makes people's income and wealth equal.
D.4.5	B, M	rule of law.
D.4.6	B, M	freedom of speech.
D.4.7	B, M	exerting national power in international affairs.
D.4.8	B, M	historical events and mistakes are handled openly and fairly.
Category D.5: *Evaluation of severity of socioeconomic issues*		
D.5.1-6		How severe do you think the following issue is to China today? (0 = not severe at all; 10 = extremely severe)
D.5.1	B, M	social security and welfare
D.5.2	B, M	employment
D.5.3	B, M	environmental pollution
D.5.4	B, M	wealth inequality
D.5.5	B, M	government corruption
D.5.6	B, M	discrimination against ethnic minority
Category D.6: *Evaluation of democracy and human rights protection in China*		
D.6.1	B, M	For the following two statements, which do you think best describe the current situation in China? Statement A: China is run by a few big interests looking out for themselves; Statement B: China is run for the benefit of all the people. (0 = completely close to Statement A; 10 = completely close to Statement B)
D.6.2	B, M	How democratically is China being governed today? (0 = not at all democratic; 10 = completely democratic)
D.6.3	B, M	How much respect is there for individual human rights nowadays in China? (0 = no respect for human rights at all; 10 = a great deal of respect for individual human rights)
D.6.4	B, M, E	How important it is for you to live in a country that is governed democratically? (0 = absolutely important; 10 = not at all important)
Category D.7: *Justification of controversial policies and issues*		
D.7.1-16		We list below a few controversial socioeconomic issues. To what extent do you think they can be justified? (0 = never be justified; 10 = always be justified)
D.7.1	B, M	policies toward ethnic minorities in China
D.7.2	B, M	Hukou policy and internal migration restrictions
D.7.3	B, M	one-child policy
D.7.4	B, M	Mainland China's policy towards Hong Kong
D.7.5	B, M	Mainland China's policy towards Taiwan
D.7.6	B, M	the use of violence to pursue political goals (e.g. social stability)

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D.7.7	B, M	state refusal of hosting refugees from neighboring countries (e.g. North Korea; Middle East)
D.7.8	B, M	government intervenes factory production to reduce pollution
D.7.9	B, M	college admission policies (based on Gaokao)
D.7.10	B, M	privatization of state-owned-enterprises in critical industries
D.7.11	B, M	legalization of homosexual marriage
D.7.12	B, M	legalization of prostitution
D.7.13	B, M	abortion
D.7.14	B, M	sex behaviors outside of marriage
D.7.15	B, M	adoption of genetically modified or transgenetic food
D.7.16	B, M	taking soft drugs (e.g. marijuana; hashish)
Category D.8: *Willingness to act*		
D.8.1-3		To what extent do you agree with the following statements about yourself? (0 = strongly disagree; 5 = neutral; 10 = strongly agree)
D.8.1	B, M, E	If the government does not operate according to the law, I have the rights to disobey the government.
D.8.2	B, M, E	I'm not fearful of officials and I don't hesitate to object to any official who has done something wrong, or report his misconduct to the authorities.
D.8.3	B, M, E	I can't stand the powerful and influential bullying the powerless and the weak. I like to stand up for the weak.
Category D.9: *Interest in politics and economics*		
D.9.1	B, M	How interested are you in economics? (0 = not at all interested; 4 = not very interested; 7 = somewhat interested; 10 = extremely interested)
D.9.2	B, M	How interested are you in politics? (0 = not at all interested; 4 = not very interested; 7 = somewhat interested; 10 = extremely interested)
Category D.10: *National identity*		
D.10.1	B, M	How proud are you to be Chinese? (0 = not at all proud; 5 = so-so; 10 = extremely proud)
Category D.11: *Fear to criticize the government*		
D.11.1	B, M	People may hold critical attitudes toward the government. If you hold critical attitudes toward the government, to what extent would you be afraid of expressing your true attitudes in public? (0 = not at all afraid; 5 = somewhat afraid; 10 = extremely afraid)

Behaviors and planned behaviors (E)

Next, we ask participants to self-report a range of behaviors and planned behaviors for the near future.

Social interaction on politics (E.1) We next ask participants how often do they interact with other students at school, particularly for politics: *(i)* what is the frequency that the participants talk about politics with other students; and *(ii)* what is the frequency that the participants persuade other students when they hold different opinions regarding politics and current affairs.

Political participation (E.2) We next ask participants if they: *(i)* have participated in protests concerning social issues; *(ii)* plan to vote for the local People's Congress Representatives in the next election; and *(iii)* have complained to school authorities to protect personal interests.

Investment in the Chinese stock market (E.3) We then ask participants whether they are currently invested in the Chinese stock market.[13] If so, participants would then have an option to report to us the total amount of fund they are currently investing, the specific stock that they are holding, etc.

Plan after graduation (E.4) We next ask participants regarding their plans upon graduating from undergraduate studies. Specifically, participants are asked to rank the degree of attractiveness across the following choices: *(i)* graduate study in China; *(ii)* master degree in a foreign country; *(iii)* PhD degree in a foreign country; *(iv)* military; and *(v)* work immediate after graduation.

Career preferences (E.5) Last but not least, we elicit participants' future career preferences in two dimensions: *(i)* sectorial preferences (e.g. civil servants, private firms, state-owned-enterprises, institutional organizations, entrepreneurship); and *(ii)* location preferences (e.g. Beijing, Shanghai, Guangzhou, Shenzhen tier-2 domestic cities, Hong Kong, Taiwan, foreign cities).

Panel E: Behaviors and planned behaviors

Category E.1: *Social interaction on politics*		
E.1.1	B, M, E	When you get together with your friends, would you say you discuss political matters frequently, occasionally, or never? (0 = never; 5 = occasionally; 10 = frequently)
E.1.2	B, M, E	When you, yourself, hold a strong opinion, do you ever find yourself persuading your friends, relatives or fellow schoolmates to share your views or not? If so, does this happen often, from time to time, or rarely? (0 = never, 2 = rarely; 5 = from time to time; 8 = often; 10 = always)
Category E.2: *Political participation*		
E.2.1	B, M, E	Have you ever participated in protests concerning social issues (such as pollution and education)? (0 = no; 1 = yes)
E.2.2	B, M, E	Do you plan to vote for the local People's Congress Representatives during the next election? (0 = no; 1 = yes)
E.2.3	B, M, E	Have you ever complained to school authorities to protect your personal interest (e.g. regarding tuition, dorm assignment)? (0 = no; 1 = yes)
E.2.4	B, M	Have you ever participated in activities from non-profits (such as volunteer services)? (0 = no; 1 = yes)
Category E.3: *Investment in the Chinese stock market*		
E.3.1	B, M, E	Are you currently investing in the Chinese stock market? Note: this is regarding your own brokerage account that you have full control over; not including the ones co-owned with your parents. (0 = no; 1 = yes)
Category E.4: *Plan after graduation*		
E.4.1-5		What do you plan to do after you graduate from the undergrad study? (0 = no; 1 = yes)
E.4.1	B, M, E	graduate school in China (e.g. direct master degree; 2+2 programs)
E.4.2	B, M, E	master degree abroad
E.4.3	B, M, E	PhD degree abroad
E.4.4	B, M, E	military
E.4.5	B, M, E	work right away

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[13] Chinese citizens are restricted from directly investing in foreign stock market such as Hong Kong Stock Exchange or the counterparts in the US.

Category E.5: *Career preferences*		
E.5.1-8		From the following list of job types, please pick the top 3 that appeal to you the most, and rank them accordingly. (0 = not picked as top choices; 1 = picked as top choices)
E.5.1	B, M, E	working in the national civil service
E.5.2	B, M, E	working in the local civil service
E.5.3	B, M, E	working in the military
E.5.4	B, M, E	working for a Chinese private firm
E.5.5	B, M, E	working for a foreign firm in China
E.5.6	B, M, E	working for a state-owned enterprise
E.5.7	B, M, E	working for institutional organizations (e.g. school, hospital, research institute)
E.5.8	B, M, E	starting your own firm as an entrepreneur
E.5.9-16		What is the ideal location for you, in terms of living and working in the future? (0 = not picked; 1 = picked)
E.5.9	B, M, E	Beijing
E.5.10	B, M, E	Shanghai
E.5.11	B, M, E	Guangzhou / Shenzhen
E.5.12	B, M, E	tier 2 cities in central China
E.5.13	B, M, E	other cities in China
E.5.14	B, M, E	Hong Kong / Macau
E.5.15	B, M, E	Taiwan
E.5.16	B, M, E	foreign cities

Demographics, background characteristics, and fundamental preferences (F)

Finally, we measure and collect a range of individual and household characteristics. These questions are only included in the baseline survey, and are not repeated across other waves in the panel survey.

Personal characteristics (F.1) We collect a wide range of individual demographic characteristics: gender, birth date, height, ethnicity, hometown, *hukou* status, religiosity, and whether one is a member of the Chinese Communist Party at the time of the baseline survey.

Educational background (F.2) We collect information on students' track enrolled in high school (science vs. humanities), as well as the currnt major that students study in university. We code university major as an indicator of 1 if it belongs to the broad category of social sciences or humanities.

English ability and oversea travel experiences [at baseline] (F.3) We ask students regarding the tests they have passed in domestically hosted standardized English test (Level 4, Level 6, etc.), and we code it as an indicator of 1 if students have passed at least Level 4. We also ask students if they have taken any English tests hosted oversea, such as TOEFL and IELTS. In addition, we ask students if they have traveled to Hong Kong, Macau, Taiwan, or other foreign nations during the past 3 years.

Household characteristics (F.4) We also collect a range of household characteristics that capture participants' household background and the environment they grew up in. For example: the education attainment of parents, the Chinese Communist Party membership of parents, and the total annual household income.

Fundamental preferences (F.5) We elicit a complete profile of participants' fundamental economic preferences, covering four dimensions: *(i)* risk preferences; *(ii)* time preferences; *(iii)* altruism; and *(iv)* reciprocity.[14] We code those so that risk tolerance, patience, and reciprocity are all coded as larger numbers.

Panel F: Demographics, background characteristics, and fundamental preferences

Category F.1: *Personal characteristics*		
F.1.1	B	What is your gender? (0 = female; 1 = male)
F.1.2	B	What is your birth year?
F.1.3	B	What is your height (in cm)?
F.1.4	B	What is your ethnicity? (0 = non-Han; 1 = Han)
F.1.5	B	Which province were you born? (0 = non-coastal provinces; 1 = coastal provinces)
F.1.6	B	Which province did you primarily reside in prior to entering college? (0 = non-coastal provinces; 1 = coastal provinces)
F.1.7	B	What is your hukou status before entering college? (0 = rural; 1 = urban)
F.1.8	B	What is your religious affiliation? (0 = non-religious; 1 = religious)
F.1.9	B	Are you a member of the Chinese Communist Party? *[at baseline]* (0 = no; 1 = yes)
Category F.2: *Educational background*		
F.2.1	B	Which university are you enrolled in right now? (0 = 2nd-tier; 1 = elite)
F.2.2	B	Which academic track did you choose in senior high school? (0 = humanities; 1 = science)
F.2.3	B	What is your major at college? (indicator if it is social sciences or humanities)
Category F.3: *English ability and oversea travel experiences [at baseline]*		
F.3.1	B	Which credentials hosted in China have you received in terms of your English ability? (0 = no credentials; 1 = yes, at least Level 4)
F.3.2	B	Which English exams hosted oversea have you taken (e.g. TOEFL, IELTS)? (0 = no; 1 = yes)
F.3.3	B	Have you traveled to Hong Kong, Macau, or Taiwan during the past 3 years? (0 = no; 1 = yes)
F.3.4	B	Have you traveled to any foreign countries beyond Hong Kong, Macau and Taiwan during the past 3 years? (0 = no; 1 = yes)
Category F.4: *Household characteristics*		
F.4.1	B	How many siblings to do have?
F.4.2	B	What is your father's highest educational attainment? (0 = below senior high school; 1 = at least senior high school)
F.4.3	B	Which sector does your father work at? (if retired, which sector did he work at prior to retirement) (indicator if works in government, SOE, or related public sectors)
F.4.4	B	Is your father a member of the Chinese Communist Party? (0 = no; 1 = yes)
F.4.5	B	What is your mother's highest educational attainment? (0 = below senior high school; 1 = at least senior high school)
F.4.6	B	Which sector does your mother work at? (if retired, which sector did she work at prior to retirement) (indicator if works in government, SOE, or related public sectors)
F.4.7	B	Is your mother a member of the Chinese Communist Party? (0 = no; 1 = yes)
F.4.8	B	How much is the total income that your household (including both your father, mother, and you) earned during the past year? (Note: include salary, wage, bonus, benefits, stipend, dividend; exclude retirement pension and other welfare payment from the government.) [number is imputed from categorical choices)

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[14] Elicitation of these preferences is based on Falk et al. (2014). We add an incentive-compatible component based on Eckel and Grossman (2008) to their original risk preferences module.

Category F.5: *Fundamental preferences*		
F.5.1	B	Please tell me, in general, how willing or unwilling you are to take risks? (0 = completely unwilling to take risks; 10 = very willing to take risks)
F.5.2	B	Certainty equivalent from step-wise lottery choices (what would you prefer: a draw with 50 percent chance of receiving RMB 300, and the same 50 percent chance of receiving nothing, or the amount of RMB xxx as a sure payment?)
F.5.3	B	Eckel and Grossman (2002) lottery decisions: for the following lottery options, please choose one that you like the most? *[incentive-compatible]* (coded as higher value means preferring riskier options)
F.5.4	B	How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future? (0 = completely unwilling; 10 = very willing)
F.5.5	B	I tend to postpone tasks even if I know it would be better to do them right away (0 = describes me perfectly; 10 = does not describe me at all)
F.5.6	B	How willing are you to give to good causes without expecting anything in return? (0 = completely unwilling; 10 = very willing)
F.5.7	B	Today you unexpectedly received RMB 10,000. How much of this amount would you donate to a good cause? (value between 0 and 10,000)
F.5.8	B	When someone does me a favor I am willing to return it. (0 = describes me perfectly; 10 = does not describe me at all)
F.5.9	B	I assume that people have only the best intentions. (0 = does not describe me at all; 10 = describes me perfectly)
F.5.10	B	When a stranger helps you, would you be willing to give one of the following presents to the stranger as a thank-you gift? (coded as higher value means choosing more valuable gifts)
F.5.11	B	How willing are you to punish someone who treats you unfairly, even if there may be costs for you? (0 = completely unwilling; 10 = very willing)
F.5.12	B	How willing are you to punish someone who treats others unfairly, even if there may be costs for you? (0 = completely unwilling; 10 = very willing)
F.5.13	B	If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so. (0 = describes me perfectly; 10 = does not describe me at all)

Appendix E Treatment effects estimated from midline survey (May 2016)

E.1 Sample summary statistics and balance check

Overall, 1,617 participants complete the follow-up survey, implying a panel retention rate of 90.4%. Appendix Table A.2 presents the summary statistics for the overall sample who have completed both the baseline and 1st follow-up survey (columns 1 and 2), and those for the existing users (column 3) and each of the 4 treatment groups separately (columns 4-7), across all items in the demographics, background characteristics and fundamental preferences section of the survey *(Panel F)* described previously. We conduct an ANOVA test for the joint differences in means across the 4 experimental treatment groups, and we report the F-statistics and p-value in column 8 and 9, respectively. Members of 4 experimental treatment groups (conditional on having completed the 1st follow-up survey) are statistically indistinguishable from each other, in terms of these characteristics examined.

E.2 Exposure's impact on media-related behaviors, attitudes, and beliefs

We compare the average level of these behaviors, attitudes, and beliefs across the four treatment groups and the existing users prior to treatment assignment, at the time of the first follow-up survey, one dimension at a time. The comparison results are presented in regression estimates on non-standardized outcomes in Appendix Table A.17, Panel A, where we also provide summary statistics across various groups of students.

We find that Group-AE students have shifted away from domestic media outlets as important sources of information, and substituting them with foreign media outlets and foreign social media — although domestic social media remains as the most important source *(Category A.1)*.[15]

Echoing Group-AE students' increased consumption of foreign media, a pattern consistent with that observed with respect to students' assessment of value added emerges. Six months after the treatment assignment, students who received only the access treatment (Group-A) or the encouragement treatment (Group-NE) hold beliefs and attitudes regarding media that remain indistinguishable from that of the students who received none (Group-N). However, the students newly exposed to foreign media outlets (Group-AE) have experienced changes in a broad range of beliefs and attitudes regarding media. They become: willing to pay higher price for access to uncensored Internet access and more likely to perceive foreign media outlets having high value added *(Category A.3)*; more likely to distrust domestic media outlets in China (either state-owned or privately-owned), and more likely to trust foreign media outlets *(Category A.4)*; more likely to believe that contents on domestic media outlets are censored at a heavier degree, while contents on foreign media outlets are less censored *(Category A.5)*; more likely to believe that it is unjustified for Chinese media outlets to censor potentially sensitive economic news and political news *(Category A.6)*; more likely to be believe that such censorship is driven by the Chinese government's policies, rather than media outlets' own interests or ideology *(Category A.7)*; and more likely to believe that censorship is particularly severe when Chinese media reports on negative events occurred in China, and more likely to believe that Chinese media outlets are more biased when it reports news in China and abroad *(Category A.8 and A.9)*. While the existing users continue to hold beliefs regarding media that are significantly different from that of the students who haven't been using censorship circumvention tools yet, these newly exposed users

[15] Relatedly, they also report to visit foreign websites for the purpose of information more frequently.

in Group-AE begin to converge towards existing users — closing the gap (although not entirely) in many belief dimensions.

E.3 Impact of exposure to uncensored information

We compare the average level of the outcomes of interest, one at a time, across the 4 experimental treatment groups as well as the existing users prior to the treatment assignment, at the time of first follow-up survey. The comparison results are presented in regression estimates on non-standardized outcomes in Appendix Table A.17, Panel B, C, D, and E, respectively.

Knowledge *(Panel B)* First, we examine whether the exposure to uncensored information leads to changes in students knowledge on news events that are explicitly covered in the encouragement treatment where we distribute news quizzes with monetary rewards *(Category B.1)*. Note that these are the *only* outcomes of interest that are explicitly covered in the encouragement treatment. Across all 4 news events that we have quizzed students in the encouragement treatment, we find that students in the Group-AE are significantly more likely to answer these questions correctly at the time of the followup survey,[16] comparing to Group-N, Group-NE, and Group-A students, who are statistically indistinguishable from each other.[17]

Moreover, we find that exposure has significantly increased Group-AE students' likelihood of being able to answer quizzes on other censored news events as well *(Category B.2)*, even if these events are not explicitly covered in our encouragement treatment. Although it is likely that students in Group-AE can use Google to search for answers to the quizzes during the survey, we do not think this is what driving the differences in Group-AE students' level of knowledge. First, we intentionally do not reward students on their correctly answer in this module to mitigate their incentives to search for answers during the survey. Second, Group-A students have access to Google as well, yet one does not see an increase in knowledge among them. Third, throughout the knowledge module of the survey, the time students spent on the modules does *not* significantly predict their likelihood of answering quizzes correctly; on average students spent 6.7 seconds per question. We plot the distribution of time spent and number of clicks recorded in the knowledge module across treatment groups in Appendix Figure A.19, first among all study participants, then for those participants who answered more than half of the questions correctly. One can see that there is no evidence that Group-AE students spent significantly longer time or submitted more clicks during the knowledge module, compared to other groups of students.

This contrasts with the events that are *not* censored on the domestic media during the same period of time, regarding which the Group-AE students exhibit no noticeable difference in their likelihood to answer quizzes correctly. In other words, exposure leads to increased informedness in specifically defined knowledge domain that is otherwise unavailable on the domestic media outlets.[18]

[16] These quizzes in the 1st followup survey cover the same material as the ones in the encouragement treatment, but in different format.

[17] Notice that while the existing users of the censorship circumvention tools are significantly more likely to answer these quizzes correctly as well, here we observe one of the rare cases that the newly exposed Group-AE students exhibit correction rate even higher than that of the existing users — presumably because we have directed Group-AE students' attention on this set of particular news events, while the existing users might have omitted them in their regular news consumption.

[18] In other words, among the university student population in our experimental sample, those students who remain unexposed (directly) to uncensored information are not ignorant or broadly uninformed about current affairs. In fact, they exhibit a fairly high level of informedness based on their correction rate in answering the news quizzes on uncensored events — however, they are noticeably under-informed in the specific domains where information is censored by the government and unavailable on the domestic news outlets.

Apart from news events themselves, exposure also makes Group-AE students more knowledgeable in censored notable figures in China who are featured in recent politically sensitive events (*Category B.3*).[19] As two placebo tests, we show that exposure induces increase in knowledge on neither figures who are politically nonsensitive, nor a fake name that we created ("Lequn Jia").[20] Interestingly, notable figures who are politically censored and *not* featured in event events remain unheard of even among the Group-AE students. We speculate that this is because news outlets serve as crucial information portals, and the search cost of information particularly with respect to hundreds of names that are censored by the Great Firewall) becomes substantially higher if these names do not appear on the news outlets directly.[21]

This, however, does not imply that students never go beyond current news events covered on the *New York Times* to acquire uncensored information that is relatively more costly to search. In fact, we find that students in the Group-AE are significantly more likely to become aware of a range of protests and independence movements in the past (*Category B.4*), particularly those events that took place in the Greater China region (e.g. the Umbrella Revolution in 2014).[22] The increased knowledge on these events suggests that newly exposed students may realize that if there are many current censored events whose existence they are unaware of, there probably exist many more events occurred in the past that are also censored and hence of which they are ignorant. As a result, we observe them beginning to explore additional websites blocked by the Great Firewall — in particular *Wikipedia*, which serves as the "information portal to the past."[23]

Lastly, we investigate the impact of exposure to uncensored information on students' meta-knowledge: their assessment of their own level of informedness of political events in China, and their assessment relative to other students at the school *(Category B.5)*. We find that while exposure has made Group-AE students more likely to consider themselves as better informed of the political issues in China in the absolute term, when they compare themselves with peers, they become more *pessimistic* of their own level of informedness, believing that other students are in general more informed than themselves.[24] This pattern of optimism of other students is a more general phenomenon that we observe. We explicitly study this optimism and its implications on students higher order beliefs and coordination outcomes in a companion paper (Chen and Yang, 2017).

Economic beliefs *(Panel C)* We find that students newly exposed to uncensored information lower their belief regarding China's GDP growth rate in 2016, elicited in an incenticized and private manner, by 1.3 percentage point (to 6.3%) where the actual growth rate is estimated to be 6.7%. This is a substantial decrease

[19]These figures are covered in news stories only available on uncensored foreign media outlet during the period between the baseline and the first follow-up survey. For example, when the Great Firewall began to censor Zhiqiang Ren in March 2016, the *New York Times* publishes an article "Critcicizing the media mouthpiece of the Chinese Communist Party, Zhiqiang Ren becomes censored", which explicitly describes the censorship decision and the speculated cause of Ren's becoming politically sensitive (source: `http://cn.nytimes.com/china/20160229/c29chinaren/`, last accessed on January 14th, 2017.)

[20]Additionally, the level of awareness of Lequn is the lowest (statistically indistinguishable from 0) across all 11 names that we measure, indicating that students are not randomly clicking during this part of the survey, and our simple binary measurement of knowledge indeed captures some meaningful variation across the students.

[21]Similar information portal effect is documented by Athey and Mobius (2012), in the context of Google News platform.

[22]These events are always considered highly politically sensitive and are treated with tight censorship by the Great Firewall. See, among others, King, Pan, and Roberts (2013) and Tai (2015).

[23]As a placebo, we ask students their awareness of a fake protest event that we created ("Tomorrow Revolution") — proportion of students who indicate that they have heard of this event is indistinguishable from zero, and we find no impact of the exposure to uncensored information in this dimension.

[24]In particular, students who are not exposed to uncensored information (and hence are less knowledgeable in censored events) are *more* optimistic about their relative level of informedness as comparing to the newly exposed students. This suggests a degree of over-confidence among the non-exposed students, potentially also accounting for their low demand for uncensored information — since they believe that they are already fairly informed and hence no need to obtain information from more accurate sources.

in optimism, since these students now hold growth rate belief that falls *below* the government's explicit target (6.5-7.0%), in contrast with the above-target beliefs held by the unexposed students. Moreover, exposure also results in Group-AE students to lower their beliefs on the Shanghai Stock Composite Index at the end of 2016 by 369 index points (to 2,879), where the actual closing level of the index on December 31st, 2016 is 3,104. Opposite to the increased pessimism on China, exposure has made the Group-AE students more optimistic about the economic performance in the US: comparing to students who remain unexposed to uncensored information, they believe a higher GDP growth rate in the US during 2016 by 1.0%, and a higher Dow Jones Index on December 31st, 2016 by 1,247 index points.[25]

In addition, we elicit and examine how exposure affect students' confidence with respect to their guesses on the economic performance in China *(Category C.2)* and in the US *(Category C.4)*, which is conceptually similar to meta-knowledge as in Category B.5 described above. One can see that while exposure to uncensored information has significantly affected students' elicited beliefs, it barely changes their levels of confidence regarding the guesses as compared to those of the unexposed students.[26]

Political attitudes *(Panel D)* Next, we measure a comprehensive set (a total of 11 categories) of students' political attitudes, and we examine to what extent these attitudes are reshaped after students have been exposed to uncensored information.

We find that comparing to the unexposed students in Group-N, Group-NE, and Group-AE, the newly exposed students become: more likely to believe that both the economic and political system in China need fundamental changes *(Category D.1)*; more likely to state distrust towards the central, provincial and local government of China, China's domestic financial institutions, while more likely to state a higher trust towards the government of Japan and the US, as well as NGOs in general *(Category D.2)*; more likely to be unsatisfied with the Chinese government's performance in economic development and domestic politics (while unchanged in their level of satisfaction in the domain of diplomatic affairs) *(Category D.3)*; not significantly different in terms of the criteria that they use to evaluate government's performance *(Category D.4)*; more likely to consider socioeconomic issues ranging from welfare to employment, to environmental pollution, to inequality, to government corruption, to discrimination against minority groups to be more severe a problem in China today *(Category D.5)*; more likely to downgrade their rating on the level of democracy and human rights protection in China, and more likely to believe that China is currently operating in manners that fail to care for the masses *(Category D.6)*; more likely to think that controversial polices, ranging from policies towards minorities, to internal migration restrictions, to one-child policy, to policies towards Hong Kong and Taiwan, to government's use of violence to maintain social stability, to the decision to refuse admission of refugees from the North Korea, to be unjustified; and more likely to believe that liberal issues, ranging from legalizing homosexual marriage, to legalizing prostitution, to abortion, to be justified *(Category D.7)*; more likely to state that they are willing to battle illegal actions conducted by the government, and willing to stand up to fight for the weak (although unchanged in terms of their will-

[25]We observe a pattern of anchoring when students guess the GDP growth rate in the US: since most students have no prior knowledge on the scale of GDP growth rate in the US, many halved their guess of the Chinese GDP growth rate to form their guess on the US growth rate — making the average guess on the US GDP growth rate to be 3.2% among our study subjects. This implies that students while being more optimistic, they are uniformly moving away from truth growth rate, since their anchoring point on the US GDP growth rate is considerably higher than historical growth rate, which is 1.4% in 2015.

[26]This is yet another piece of evidence suggesting that students unexposed to uncensored information may be over-confident regarding themselves, failed to realize their need for more accurate information sources, and hence resulting in their low demand for foreign media outlets and uncensored information.

ingness to report government's misconduct) *(Category D.8)*; and more interested in political and economic issues in general *(Category D.9)*.[27] We find that exposure does not lead Group-AE students to hold a weaker national identity, as measured by students' pride in being Chinese *(Category D.10)*.

Importantly, we do *not* find evidence that exposure to uncensored information has made students slightly more fearful of expressing critical attitudes toward the government *(Category D.11)*.

Behaviors and planned behaviors *(Panel E)* Finally, we investigate whether exposure to uncensored information changes students' (self-reported) behaviors and planned behaviors for the near future. We find that exposure has made students: more likely to engage with other students to discuss political topics *(Category E.1)*; more likely to pull out their investment from the Chinese stock market, although the base rate stock market participation rate is only 5%) *(Category E.3)*; more likely to planning on leaving China in the near China by attending graduate school oversea *(Category E.4)*; and more likely to prefer foreign cities as location for future work and living, while stay unchanged in their sectorial preferences of their career had they stayed in China *(Category E.5)*. We don't find strong evidence that students are actively engaged politically *(Category E.2)*, potentially due to the lack of opportunities.

[27]The discussion of whether students become more informed of "truth" after consuming uncensored information from foreign media outlets requires us to take a stance on whether reports from the *New York Times* are closer to "truth" than the ones found on, say, the *People's Daily*. It is challenging to define "truth" in different news scenarios, particularly in domains beyond knowledge itself. News reports from the *New York Times* is liberally biased (Groseclose and Milyo (2005) and (Gentzkow and Shapiro, 2010)). However, we do believe that when students in our experiments are on average moving, for example, from rating China's level of human rights protection at 4.6 (fairly good) down to 3.4 (fairly unacceptable), students are indeed approaching an assessment more aligned with truth (or reality)

Appendix F Conceptual framework

To clarify the factors that constrain students' consumption of uncensored and politically sensitive information, and to frame our experimental design, we consider a simple one-armed bandit problem that captures students' dynamic choice of media consumption. The framework demonstrates how media consumption choices are affected by both the cost of accessing media outlets and students' beliefs regarding these outlets, and how media consumption affects students' subsequent beliefs.

F.1 Setup

Media consumption of various news outlets Students consume media from news outlets in each period t in order to find out whether negative events such as corruption scandals have taken place in China in that period. These negative events are valuable signals for incumbent quality, and we assume that media consumption generates direct payoff to students which is realized at the end of each period. The direct payoff structure captures either the intrinsic or instrumental value from reading news report on negative events. Intrinsically, students benefit from knowing the details of a negative event, which reflects the curiosity or entertainment value of news consumption. Instrumentally, consuming news on negative events allows students to know the incumbent's type and hence make more informed decisions accordingly.[28]

Students choose between two news outlets: the domestic news outlet ($m_t = D$) that is directly controlled by the state when it comes to reporting on negative events, and the foreign news outlet ($m_t = F$) that is not subject to the state control of China. The cost to access domestic news outlet is 0 (conditional on having access to the Internet already), and the cost to access foreign news outlet is $C \geq 0$ per period. In particular, if the foreign news outlet is blocked by the Great Firewall, then $C > 0$.

Consuming domestic news outlet yields constant amount of earning λ^D in each period. For simplicity, one can assume that the domestic news outlet never report negative events, and its payoff is independent of its reporting. We can relax this assumption and instead assume that the payoff of domestic news outlet is correlated with its reporting, and this would not change the result of the model.[29] The consumption of foreign news outlet yields a binary earning depending on whether the negative event is reported: high earning (λ^n) if foreign news outlet reports negative event in that period, or low earning ($\lambda^\varnothing$) if it does not report negative event in that period, where $\lambda^n > \lambda^\varnothing$. The probability that foreign news outlet would report negative event is unknown to students, due to reasons such as students are unsure whether negative event would occur at all, or whether foreign news outlet would be informed of the event and hence report it when it occurs. The uncertain payoff of consuming foreign news outlet reflects the fact that students are unfamiliar with such outlet as it is not allowed to operate and campaign in the Chinese market.

Government's type, negative events, and reporting with censorship Suppose that the Chinese government can be either good ($g = G$) or bad ($g = B$). If $g = G$, negative events would occur in each period

[28] In addition, students might benefit from knowing the "type" of negative events (e.g. economic corruption, political scandal, environmental pollution) that take place in a particular period, which can inform them to choose corresponding actions in response to such event. Assuming that the event type is an independent realization in each period, conditional on negative event occurring, then students need to consume the specific news report in order to learn about the type realization (in addition to the overall knowledge of whether negative events have occured).

[29] This turns the current model into a two-armed bandit game. According to Berry and Fristedt (1985), all two-armed bandit games are equivalent to a one-armed bandit game where the payoff of one of the arms is degenerate to the mean of original payoff distribution.

with probability $p^G \in (0,1)$, and no events would occur with probability $1-P^G$. If $g=B$, negative events would occur in each period with probability $p^B \in (0,1)$, and $p^B > p^G$. When negative events occur, foreign news outlet may either report in an uncensored or informative manner — reporting the event with probability $\delta^{uc} \in (0,1]$, or report in a censored or uninformative manner — reporting the event with probability $\delta^c \in (0,1)$, where $\delta^c < \delta^{uc}$. Hence, given government's type and foreign news outlet's reporting scheme, we can specify the probability of observing reports on negative events on foreign news outlet as the product of probability of negative event occurring (p), and the probability of foreign news reporting the event (δ). Note that for simplicity, we treat all negative events as homogeneous in terms of their probability of occurring and the probability of being reported. One can extend the model by allowing these probabilities to differ across different types of negative events.

Beliefs on government and censorship Students have prior belief over the government's type. Denote belief before making $t=1$ decision as $\mu_0^B \in (0,1)$, such that the probability of the government being a bad type is μ_0^B, and the probability of the government being a good type is $1-\mu_0^B$. Students also have prior belief over foreign news outlet's reporting scheme. Denote belief before making $t=1$ decision as $\mu_0^{uc} \in (0,1)$, such that the probability of foreign news outlet reports negative events in an uncensored or informative manner is μ_0^{uc}, and the probability of foreign news outlet reports in a censored or uninformative manner is $1-\mu_0^{uc}$. Note that the prior beliefs μ_0^B and μ_0^{uc} need not be accurate with respect to the true likelihood.

F.2 Bayesian updating of beliefs on the government and censorship

Assuming that students update their beliefs in a Bayesian manner. Then after the t'th time they consume foreign news outlet, their posterior beliefs μ_t^B and μ_t^{uc} can be specified as the following: conditional on observing k reports on negative events (hence experiencing the realization of high payoffs) and $t-k$ times when foreign news outlet does not report on negative events (hence experiencing the realization of low payoffs) out of the t draws,

$$\mu_t^B = \frac{\mu_0^B\mu_0^{uc}(p^B\delta^{uc})^k(1-p^B\delta^{uc})^{t-k} + \mu_0^B(1-\mu_0^{uc})(p^B\delta^c)^k(1-p^B\delta^c)^{t-k}}{\begin{array}{l}\mu_0^B\mu_0^{uc}(p^B\delta^{uc})^k(1-p^B\delta^{uc})^{t-k} + \mu_0^B(1-\mu_0^{uc})(p^B\delta^c)^k(1-p^B\delta^c)^{t-k} \\ \quad + (1-\mu_0^B)\mu_0^{uc}(p^G\delta^{uc})^k(1-p^G\delta^{uc})^{t-k} + (1-\mu_0^B)(1-\mu_0^{uc})(p^G\delta^c)^k(1-p^G\delta^c)^{t-k}\end{array}}$$

$$\mu_t^{uc} = \frac{\mu_0^B\mu_0^{uc}(p^B\delta^{uc})^k(1-p^B\delta^{uc})^{t-k} + (1-\mu_0^B)\mu_0^{uc}(p^G\delta^{uc})^k(1-p^G\delta^{uc})^{t-k}}{\begin{array}{l}\mu_0^B\mu_0^{uc}(p^B\delta^{uc})^k(1-p^B\delta^{uc})^{t-k} + \mu_0^B(1-\mu_0^{uc})(p^B\delta^c)^k(1-p^B\delta^c)^{t-k} \\ \quad + (1-\mu_0^B)\mu_0^{uc}(p^G\delta^{uc})^k(1-p^G\delta^{uc})^{t-k} + (1-\mu_0^B)(1-\mu_0^{uc})(p^G\delta^c)^k(1-p^G\delta^c)^{t-k}\end{array}}$$

Notice immediately that without consuming foreign news outlet, students would not have the opportunity to update their beliefs regarding its probability of reporting negative events. In addition, consider the case when $t=k=1$ (namely, after having observed the negative event reporting during the 1st period), $\mu_1^B(r_1=b) > \mu_0^B$, and $\mu_1^{uc}(r_1=b) > \mu_0^{uc}$ — beliefs in both dimensions are updated upward. Correspondingly, students shift up their beliefs on the value of foreign media.

Then, students' predicted probability of observing reports on negative events and hence receiving high

payoff from foreign news outlet in period t at the beginning of the period is:

$$\begin{aligned}&q_{t-1}(\mu^B_{t-1}, mu^{uc}_{t-1}; p^B, p^G, \delta^{uc}, \delta^c)\\ =&\mu^B_{t-1}\mu^{uc}_{t-1}p^B\delta^{uc} + \mu^B_{t-1}(1-\mu^{uc}_{t-1})p^B\delta^c + (1-\mu^B_{t-1})\mu^{uc}_{t-1}p^G\delta^{uc} + (1-\mu^B_{t-1})(1-\mu^{uc}_{t-1})p^G\delta^c\end{aligned}$$

F.3 Media consumption choices

We consider the case of an infinite period game ($t = 1, 2, 3, ...$), and students discount each period's payoff by $\beta \in (0, 1)$. $u(m_t = F) \in \{u(\lambda^b - C), u(\lambda^\emptyset - C)\}$ is the per period utility from the consumption of foreign news outlet (net of cost to access C), and $u(m_t = D) = u(\lambda^D)$ is the per period utility from the consumption of domestic media outlet.

A decision rule of media consumption choices is a sequence $M = (m_1, m_2, ...)$ of functions adapted to the observations; that is, m_n may depend on past actions and observations (namely, past payoff realizations): $m_n(m_1, u(m_1), m_2, u(m_2), ..., m_{n-1}, u(m_{n-1}))$. To abuse the notation, we use m_n to denote both the function of past actions and observations, as well as the media consumption choices made at stage n.

For each student, she seeks to find a decision rule M to maximize her expected total discounted return from media consumption $V(M)$:

$$\max_{M=(m_1,m_2,...)} V(M) = \mathbb{E}_{\mu^B_0, \mu^{uc}_0} \sum_{t=1}^{\infty} \beta^{t-1} u(m_t)$$

We now present 2 propositions that are derived following the theorems on *k-armed bandit problem* (Berry and Fristedt, 1985).

Proposition 1 *If it is initially optimal to choose domestic news outlet in the sense that $sup_M V(M) = V^* = sup\{V(M) : M \text{ such that } m_1 = D\}$, then it is optimal to choose domestic news outlet always and $V^* = \frac{u(\lambda^D)}{1-\beta}$.*

Proof For a given $\epsilon > 0$, find a decision rule M such that $m_1 = D$ and $V(M) \geq V^* - \epsilon$. Then,

$$\begin{aligned}V(M) &= u(\lambda^D) + \beta \mathbb{E}_{\mu^B_0, \mu^{uc}_0}(\sum_{t=2}^{\infty} \beta^{t-2} u(m_t)|M)\\ &= u(\lambda^D) + \beta \mathbb{E}_{\mu^B_0, \mu^{uc}_0}(\sum_{t=1}^{\infty} \beta^{t-1} u(m_{t+1})|M)\\ &= u(\lambda^D) + \beta \mathbb{E}_{\mu^B_0, \mu^{uc}_0}(\sum_{t=1}^{\infty} \beta^{t-1} u'(m_t)|M^1)\\ &\leq u(\lambda^D) + \beta V^*\end{aligned}$$

where $M^1 = (m_2, m_3, ...)$ is the decision rule M shifted by 1, and $u'(m_t) = u(m_{t+1})$. Thus, we have $V^* - \epsilon \leq u(\lambda^D) + \beta V^*$, or equivalently, $V^* \leq \frac{u(\lambda^D)+\epsilon}{1-\beta}$. Since $\epsilon > 0$ is arbitrary, this implies $V^* \leq \frac{u(\lambda^D)}{1-\beta}$, but this value is achievable by choosing $m_t = D$ for all t. ■

In other words, given the primitives and students prior beliefs μ^B_0 and μ^{uc}_0, if at any period it becomes optimal for a student to consume domestic news outlet, then it is optimal for him to keep consuming do-

mestic news outlet thereafter. This implies that if there exists an optimal rule $M*$ for the media consumption choice problem, then there exists an optimal rule with the property that every period of the consumption of domestic news outlet is followed by another period of domestic news outlet consumption. Thus, students only need to decide on the time to switch from foreign news outlet to domestic news outlet, which relates this decision rule to a stopping rule problem in which the stopping time is identified with the time of switching from foreign to domestic news outlet.

As a corollary, we show that there exists an optimal rule for this problem of media consumption choices. It is either the rule that chooses domestic news outlet at all stages, or the rule corresponding to the stopping rule $N \geq 1$ that is optimal for the stopping rule problem with payoff:

$$V_N = \sum_{t=1}^{N} \beta^{t-1} u(m_t = F) + u(\lambda^D) \sum_{t=N+1}^{\infty} \beta^{t-1}$$

Proposition 2 *Let Ω denote the optimal rate of return for consuming foreign news outlet, where*

$$\Omega = \sup_{N \geq 1} \frac{\mathbb{E}_{\mu_0^B, \mu_0^{uc}} \sum_{t=1}^{N} \beta^{t-1} u(m_t = F)}{\sum_{t=1}^{N} \beta^{t-1}}$$

Then domestic media outlet is chosen initially, if and only if $\Omega \leq u(\lambda^D)$.

Proof By Proposition 1, we may restrict attention to decision rule M specified by a stopping time N which represents the last time that $m_t = F$ is chosen. The payoff with stopping time N is $\mathbb{E}_{\mu_0^B, \mu_0^{uc}}(\sum_{t=1}^{N} \beta^{t-1} u(m_t = F) + u(\lambda^D) \sum_{t=N+1}^{\infty} \beta^{t-1})$, which for $N = 0$ is $\frac{u(\lambda^D)}{1-\beta}$. Therefore, domestic news outlet (D) is optimal initially if and only if, for all stopping rules $N \geq 1$,

$$\mathbb{E}_{\mu_0^B, \mu_0^{uc}}(\sum_{t=1}^{N} \beta^{t-1} u(m_t = F) + u(\lambda^D) \sum_{t=N+1}^{\infty} \beta^{t-1}) \leq \frac{u(\lambda^D)}{1-\beta}$$

which is equivalent to,

$$\mathbb{E}_{\mu_0^B, \mu_0^{uc}}(\sum_{t=1}^{N} \beta^{t-1} u(m_t = F)) \leq u(\lambda^D) \mathbb{E}_{\mu_0^B, \mu_0^{uc}}(\sum_{t=1}^{N} \beta^{t-1})$$

which is equivalent to,

$$\frac{\mathbb{E}_{\mu_0^B, \mu_0^{uc}}(\sum_{t=1}^{N} \beta^{t-1} u(m_t = F))}{\mathbb{E}_{\mu_0^B, \mu_0^{uc}}(\sum_{t=1}^{N} \beta^{t-1})} \leq u(\lambda^D)$$

which is equivalent to $\Omega \leq u(\lambda^D)$.[30] ■

It then follows that given $p^B, p^G, \delta^{uc}, \delta^c, \lambda^D, \lambda^b, \lambda^\emptyset, C, \beta$, and assuming that $u(\cdot)$ follows CRRA structure, there exists $\mu_0^{B*} \in (0,1)$ and $\mu_0^{uc*} \in (0,1)$ such that $\Omega(\mu_0^{B*}, \mu_0^{uc*}) = u(\lambda^D)$. $\Omega(\mu_0^{B*}, \mu_0^{uc*})$ is called the *Gittins index* for foreign media consumption, representing the indifference condition such that students are indifferent between starting off with consuming foreign news outlet and choosing domestic media outlet

[30] Ω is called the *Gittins index for risky arm* in the literature on armed bandit model.

all the time. Therefore, for any $\mu_0^B \in (0,1)$ and $\mu_0^{uc} \in (0,1)$ such that $\mu_0^B \mu_0^{uc} < \mu_0^{B*} \mu_0^{uc*}$, students chooses to consume domestic media outlet in all periods.

In particular, we want to highlight the case of which μ_0^B and μ_0^{uc} are in the range such that $M^* = (D, D, D, ...)$ when $C = 0$ (given $p^B, p_B, \delta^{uc}, \delta^c, \lambda^D, \lambda^b, \lambda^\emptyset$). In this scenario, students wouldn't find foreign news outlet appealing enough to consume even when the cost is brought down to *zero*. However, once these beliefs are moved sufficiently upward (via external forces out of the equilibrium path), students may start to consume foreign news outlets and such behaviors would persist: $M^* = (F, F, F, ...)$.

F.4 Predictions of experimental outcomes

In the framework that we just describe, there are 3 potential factors that prevent students from choosing foreign news outlet. Each factor generates testable predictions, which guide our experimental design in order to distinguish which is the relevant factor that prevents students from consuming foreign news outlet and the uncensored information hosted on the outlet.

First, the foreign news outlet is costly (C) — in other words, the supply of uncensored information is restricted. If this is the relevant factor, when we provide students with free access to foreign news outlet, reducing C to zero, students would increase their consumption of foreign news outlet. Second, the payoff of foreign news outlet is low even when it reports negative events (λ^n) — in other words, students inherently do not value foreign news outlet. If this is the relevant factor, when we boost the value of consuming foreign news outlet, students would increase their consumption. Importantly, once we stop increase the value, students' consumption of foreign news outlet would revert back. Third, students hold low belief that foreign news outlet would report negative events (μ_0^{uc}) — in other words, students underestimate the value of foreign news outlet in terms of its reporting negative events. If this is the relevant factor, when we temporarily boost the value of consuming foreign news outlet, students would increase their consumption during those periods and update their beliefs on the value of foreign news outlet upward. This would lead to an increase in consumption of foreign news outlet even when the temporary boost in value ends.

The *access treatment* provides free access to uncensored Internet, which reduces C to zero. The *encouragement treatment* provides encouragement for students to consume uncensored Internet (e.g. offering small incentives for students to visit *NYTimes* China), which generates additional reporting draw(s) of the foreign news outlet that students can observe and update their beliefs, prior to them making media consumption decisions at $t = 1$.

Proposition 3 Suppose that μ_0^B and μ_0^{uc} are in the range such that $M^* = (D, D, D, ...)$ when $C = 0$ (given $p^B, p_B, \delta^{uc}, \delta^c, \lambda^D, \lambda^b, \lambda^\emptyset$). Then we have the following predictions of the experimental treatment effect:

- Group-C: remain at $M^* = (D, D, D, ...)$, and μ_t^B and μ_t^{uc} remain unchanged from μ_0^B and μ_0^{uc} for all t; this is the *status quo*.
- Group-A: remain at $M^* = (D, D, D, ...)$, and μ_t^B and μ_t^{uc} remain unchanged from μ_0^B and μ_0^{uc} for all t; this is because given the belief μ_0^B and μ_0^{uc}, students wouldn't find foreign news outlet appealing enough to consume even when the cost is brought down to zero.
- Group-CE: remain at $M^* = (D, D, D, ...)$, and μ_t^B and μ_t^{uc} remain unchanged from μ_0^B and μ_0^{uc} for all t; this is because if the student is not willing to consume foreign news outlet in $t = 1$ (despite the fact that

it would yield payoff of at least $\lambda^{\varnothing}$, as well as the indirect payoff from learning/exploration of foreign news outlet's payoff structure), then just the learning/exploration motive (namely, with zero direct payoff at that period) is not going to be sufficient for the student to purchase the additional signal at cost $C > 0$ prior to making her first media consumption decision. Without seeing the additional signals, students' prior belief μ_t^B and μ_t^{uc} will not be updated.

- Group-AE: students would opt in for the additional payoff signals (since it is now freely available, the learning value of the signal is weakly positive, and there is no opportunity cost of doing so). When the true government type is bad and foreign news outlet reports negative events in uncensored/informative manner, if $p^B \delta^{uc}$ is high or if the string of signals is sufficiently long, the probability that $\mu_0^{B'} > \mu_0^B$ and $\mu_0^{uc'} > \mu_0^{uc}$ approaches to 1 (where $\mu_0^{B'}$ and $\mu_0^{uc'}$ are the posterior beliefs after having observed the additional signals brought by the encouragement treatment). Therefore, $\mu_0^{B'} \mu_0^{uc'}$ can be moved sufficiently upward such that $M^* = (F, F, F, ...)$. In particular, if we hand pick the signals to be the ones that reveal high payoffs of foreign news outlets, then the total number of signals needed to move $\mu_0^B \mu_0^{uc}$ above the threshold such that $M^* = (F, F, F, ...)$ is small.

Appendix G Habit formation & rational addiction of media consumption

While we think the framework of one-armed bandit model is consistent with the persistent increase in demand for and consumption of uncensored information that we observe, our experiment is not explicitly designed to distinguish this belief-driven model (through learning) from other models. In particular, preference-driven models such as habit formation would also generate such pattern in consistent increase in media consumption, so long as there is intertemporal complementarity in such consumption.

While it is empirically difficult to explicitly distinguish between these belief-driven and preference-driven models, we provide suggestive evidence that the pattern we observe is unlikely to be driven by a particular form of habit formation — *rational* habit formation (or, *rational* addition) where agents anticipate benefits from habituation stocks and internalize the intertemporal complementarity when making decisions (Becker and Murphy, 1988; O'Donoghue and Rabin, 2001).

A key prediction of such model is that when agents are made aware of future increase in cost of consumption on goods that embodies intertemporal complementarity, they would decrease initial consumption to avoid building habituation stocks anticipating that they may switch consumption behavior at the time when cost increases. When we distribute the access treatment, we inform a random half of the Group-AE students that the service will expire in 18 months, while for the other random half we do not make the expiration date explicit. The expiration date information is also saliently displayed at the students' online account management portal. One addition reason we made such design choice is that we want to have more flexibility in varying the service ending time of a subsample of the Group-AE students to elicit to what extent are they willing to buy back the service on their own. For those students who are informed of the service expiration date, it may become salient to them that there will be a future increase in the cost of consuming uncensored information, as we will terminate the free account subsidy.

As shown in Appendix Figure A.20, we find no evidence that informing service expiration date makes students less likely to adopt or use the service when it was first assigned to them. In addition, we see no noticeable pattern of these students gradually decreasing their consumption of uncensored information as the explicitly stated service expiration date draws close.

We fully acknowledge that this is a weak test of rational addiction model, because we do not explicitly measure students' expectation of future cost of consumption of uncensored information, and there may be many reasons to speculate that the treatment of revealing service expiration date may not be able to induce changes in anticipated cost. For example, if students never expect to purchase the tool after the 18-month experiment anyways, the termination of service should not affect their anticipated cost at all.

Appendix H Social transmission of information

To quantify the rate of social transmission of uncensored information within the network of university dorms, we estimate a simple social learning model.

Model We consider the probability that a student i can correctly answer a quiz question on a politically sensitive event j as the sum of: the probability that she learns the event from browsing foreign news outlets herself *(direct learning)*; and *(ii)* the probability that she learns about the event from her roommates who have learned about the event *(social learning)*.

Specifically, we formulate the following linear probability model:

$$\begin{aligned} &Correct_{ij}\Big(I_i(own), N_i(roommate)\Big) \\ =&\alpha_j + I_i \cdot p_j + 1 - \Big((\alpha_j + p_j)(1 - q_{j,I_i}) + (1 - \alpha_j - p_j)\Big)^{N_i} \Big(\alpha_j(1 - h_{j,I_i}) + (1 - \alpha_j)\Big)^{3-N_i} \end{aligned}$$

where $I_i(own) \in \{0, 1\}$ indicates whether a student has access to uncensored information herself and actively browses foreign news outlets (it equals 1 if a student is in the AE group or is an existing user); and $N_i(roommate) \in \{0, 1, 2\}$ denotes the number of roommates who have access to uncensored Internet. Almost no study participants reside in dorms where all 3 roommates have received the access treatment. We hence top-code $N_i(roommate)$ at 2.

The first term, α_j, is a "base-rate" learning probability. It accounts for the fact that the probability of correctly answering the quiz questions is not zero even among students with neither direct access to uncensored information themselves nor roommates who have direct access. For the binary quiz questions, students have a 50% chance of answering the question correctly if they submit a random answer, which is absorbed by α_j. Moreover, α_j captures learning about the events from information sources other than foreign news outlets, as well as social transmissions beyond the roommate network.

The second term, $I_i \cdot p_j$, indicates the marginal increase in the probability of correctly answering the quiz questions if a student has access to uncensored Internet herself and actively browses foreign news outlets. The rate of *direct learning* is captured by p_j, and we allow it to vary across different news events (subscripted j) to reflect the fact that some events may be able to attract more attention. We don't, however, allow p_j to differ between existing users and students who have recently adopted the service, because empirically, we find their estimated rate of direct learning to be statistically indistinguishable from each other.

The remaining term describes *social learning*. In particular, it equals 1 minus the probability that a student has not learned about the event from *any* of her roommates, either because the informed roommate fails to pass on the information or the roommate is not informed herself in the first place. The parameter q_{j,I_i} captures the rate of social transmission of knowledge from a roommate who has access to uncensored information herself and actively browses foreign news outlets, while h_{j,I_i} captures that from a roommate who does not have access or do not actively browse foreign news outlets. We allow q_{j,I_i} and h_{j,I_i} to differ between students i's who have direct access themselves and those who don't.

The model makes two important assumptions about the social learning structure. First, we assume that becoming informed of a censored news event is an absorbing state, such that learning from one roommate

versus multiple roommates exhibits the same empirical outcome because our quiz outcomes are binary. Second, we assume there exists only one degree of social transmission, in the sense that if a student without direct access becomes informed, she does not pass the information on to other uninformed students. This implies that the average level of knowledge among roommates is not necessarily in equilibrium. We think this is a reasonable assumption, given the small size of the dorm rooms, and the existing evidence that higher degrees of information transmission on college campuses is extremely limited (Mobius, Phan, and Szeidl, 2015).

Identification In order to identify the parameters of interests, we need to make an additional assumption that there is no information transmission from students who do not have direct access to uncensored Internet, since q_{j,I_i} is not separately identifiable from h_{j,I_i} given that the total number of roommates is fixed. Notes that this assumption is conservative when we evaluate the marginal contribution of having one additional student to receive access to uncensored Internet. If $h_{j,I_i} > 0$, each additional student with access to uncensored Internet would crowd out part of the spillover she would have made if she did not have the access. Hence, the externality she generates through social transmission of information once she receives access would be underestimated.

We exploit the experimental variations in both I_i and N_i to identify the 4 key parameters: α_j, p_j, $q_{j,I_i=0}$, and $q_{j,I_i=1}$. We jointly estimate the 4 model parameters, using the subsample of students who have either 0 or 1 roommate assigned to the access treatment. This allows us to reduce the model to a linear structure. In addition, we restrict the estimation sample to students with 0 roommates using censorship circumvention tools prior to the experiment. Since existing users are excluded from the treatment assignment, students with roommates who are existing users would have a lower probability of having additional roommates receiving the access treatment.

Under the assumption that $h_{j,I_i} = 0$, and in the cases of $N_i = 0$ or 1, the social transmission rate q_{j,I_i} reduces to a linear structure:

$$Correct_{ij}\Big(I_i(own), N_i(roommate)\Big) = \alpha_j + I_i \cdot p_j + N_i \cdot ((\alpha_j + p_j)q_{j,I_i})$$

Hence, we can exploit the experimental variations in both I_i and N_i to identify the 4 key parameters: α_j, p_j, $q_{j,I_i=0}$, and $q_{j,I_i=1}$ from the regression coefficients of the reduced form analyses as follows. We regress whether students correctly answer quizzes on I_i, N_i, and $I_i \times N_i$,

$$Correct_{ij}\Big(I_i(own), N_i(roommate)\Big) = a + bI_i + cN_i + dI_i \times N_i$$

where the corresponding estimated regression coefficients are $\hat{a}$, $\hat{b}$, $\hat{c}$, and $\hat{d}$.

Then we can back out the model parameters of interest as follows:

- Base-rate learning: $\alpha_j = \hat{a}$;
- Direct learning rate: $p_j = \hat{b}$;
- Social transmission rate (receiver with access): $q_{j,I_i=0} = \frac{\hat{c}}{\hat{a}+\hat{b}}$;
- Social transmission rate (receiver without access): $q_{j,I_i=1} = \frac{\hat{d}}{\hat{a}+\hat{b}}$.

Out-of-sample tests Finally, we examine how well the calibrated model performs out-of-sample. Based on the model parameters estimated above, we predict the percentage of students who answer quiz questions correctly among those with 2 or more treated roommates, a subsample *not* used for our model estimation. We present the predictions for the news events with lowest, median, and higest direct learning rates, as well as the overall percentage of quizzes correctly answered in Table 4, Panel C, where we also show the bootstrapped standard errors and the actual percentage of students who correctly answer the quiz questions in the corresponding subgroup. We show results from the out-of-sample prediction exercises for all 11 news events in Table A.15, Panel C. One can see that the prediction errors remain smaller than 0.020 across 8 of 11 sensitive news events dimensions, indicating that the stylized model performs fairly well in terms of predicting students' knowledge on sensitive news events.

Appendix I Simulations of ability to correctly answer quiz on the Panama Papers

We now simulate the percentage of students in the entire student population who are able to correctly answer quiz on the Panama Papers, as the percentage of students who have access to uncensored information and are actively browsing foreign news outlets changes. Note that due to the nature of the binary quiz responses, students have a 50% chance of being able to answer the quiz correctly even if clicking randomly. One should benchmark this in order to infer the underlying true knowledge of the news events as measured by the quiz.

Our baseline simulation procedure is described as follows:

- We assume there are 10,000 students in the population (the size of undergraduate population at the elite university where we conduct the experiment, and the average size of many universities in China); and there are 2,500 dorm rooms with 4 students per room. For each student in the simulated population, we assign him to a particular dorm room and identify 3 other students who reside with him.
- We simulate the diffusion process of access to uncensored information across the student population, as the number of students with access grows from 0 to 10,000. We divide the diffusion into two phases. In the 1st phase, when the total number of students with access and actively browse uncensored information is below 2,100 (estimated amount of students who purchased tools to bypass censorship prior to the experiment), we calibrate the dorm-level clustering rate that we observe based on the survey: among these existing users, the chance that the next student who adopts the access is residing in a particular dorm room with existing users is 12 times higher than the chance that she is residing in a dorm room with no existing users. In the 2nd phase, in the baseline simulation, we assume that beyond the 2,100 existing users, each of the newly adopted student is randomly distributed across the dorm rooms (hence no clustering structure among them).
- For each student $i \in \{1, ..., 10,000\}$, we can trace her $I_i(own)$ and $N_i(roommate)$ as the number of students in the university with access to uncensored information grows from 0 to 10,000.
- For each student i, we first predict the probability that she could answer quiz on the Panama Papers if she only learns from foreign news outlet directly, which is given by $\alpha_j + p_j I_i(own)$, where $\alpha_j = 0.560, p_j = 0.333$. We randomly generate a draw from a Bernoulli distribution with mean equals to this probability for the corresponding student i, as indicator of whether she has correctly answered the quiz due to direct learning.
- For each student i, we then calculate the number of roommates that she has who have learned about the Panama Papers (namely, being able to correctly answer the quiz). We next calculate the probability that these informed roommates who have direct access to foreign news outlets would transmit such knowledge to student i, following the social learning model described in Section 5.2. We then calculate the overall learning probability allowing for first degree of social transmission, by add the probability of social transmission to the direct learning probability $\alpha_j + p_j I_i(own)$ calculated above. We randomly generate a draw from a Bernoulli distribution with mean equals to this probability for the corresponding student i, as indicator of whether she has correctly answered the quiz.

- This allows us to trace whether she can correctly answer quiz on the Panama Papers as the number of students with access grows from 0 to 10,000. We then aggregate all students and calculate the proportion of students in the entire student population who have correctly answered the quiz, as the key outcomes of interest for the simulation.

The simulated proportions of students being able to correctly answer quiz on the Panama Papers are shown in Figure 4, where we label 4 key proportion of students who have access to uncensored information and actively browse foreign news outlets: *(i)* 21.0% — the proportion of existing users, who purchase tools to bypass censorship at the status quo price; *(ii)* 23.5% — the proportion of students who have access to uncensored information, if we reduce the price of tools to bypass censorship to zero among *all* students; *(iii)* 71.7% — the proportion of students who would regularly browse foreign news websites to acquire uncensored information, if we reduce the price to access to zero, and provide all students with the encouragement treatment that we have distributed; and finally, *(iv)* 57.7% — the proportion of students who would regularly browse foreign news websites to acquire uncensored information, once we have raised their demand through the encouragement treatment, but stop fully subsidizing their censorship circumvention tool subscription.

Robust to alternative model parameters The key simulation outcomes are robust to calibrating the social learning model with alternative parameters. In particular, in Appendix Figure A.21, we show that the simulated knowledge on the Panama Papers does not qualitatively change under the following alternative counterfactual scenarios: *(i)* if the rate of direct learning doubles; *(ii)* if the rate of social transmission of knowledge is zero; and *(iii)* if the rate of social transmission of knowledge doubles.

Robust to alternative diffusion process and social learning environment The key simulation outcomes are also robust to imposing alternative diffusion process of the access tool across the student population, as well as alternative social learning environment that the students may face. In particular, in Appendix Figure A.22, we show that the simulated knowledge on the Panama Papers does not qualitatively change under the following alternative counterfactual scenarios: *(i)* if the diffusion of access to uncensored information follows the same clustering structure beyond the initial 2,100 existing users; *(ii)* if the diffusion of access to uncensored information targets new dorm rooms first (namely, prioritize each dorm to have at least one student with access); *(iii)* if the number of students in each dorm doubles (to eight students); and *(iv)* if second degree social transmission is allowed.

Robust to alternative social network structure Finally, we show that the key simulation outcomes are robust to incorporating the full conversation networks among the university students. Due to the design limitation of our experiment, we do not have a complete mapping of the actual friendship and conversation networks among the university students from whom our study participants are recruited. Instead, we use the conversation networks mapped among Harvard undergraduates, by Mobius, Phan, and Szeidl (2015). The conversation networks, rather than friendship networks, play a dominant role of information transmission among university students. The average size of conversation networks is 12.60, and an average student has 3.19 conversation links. Note that these links are not necessarily bilateral. We conduct an alternative simulation where we construct conversation networks of 13 students, and estimate the total share

of students who would be correctly answering the quiz on the Panama Papers from direct learning or social transmission of information from other students who are connected in the corresponding conversation networks. We use the same direct learning rate and the rate of social transmission of information estimated from our baseline specification. We assume that the access tool diffusion process is clustered across the conversation networks with the same rate as in the baseline simulation specification. For this part of the simulation, we reduce total students count from 10,000 to 1000 in order to save computational time.

In Appendix Figure A.23, we present simulation results varying the average conversation links that a student possesses, from 1 link to 13 links (out of 13 students in the conversation networks). As the average number of conversation links increases, the conversation networks become denser and more connected. We find that the baseline simulation results are quantitatively very similar to the alternative simulation where students possess on average 3 conversation links, the actual amount among Harvard undergraduates. In fact, our result is robust even if we double the number of conversational links a student may have.

Appendix figures and tables

Figure A.1: Screenshot of newsletter from encouragement treatment – phase 1 (introduce students to blocked foreign outlets).

Figure A.2: Screenshot of newsletter from encouragement treatment – phase 1 (highlight divergent reporting across media outlets).

Figure A.3: Screenshot of newsletter from encouragement treatment – phase 2 (news quizzes with monetary rewards).

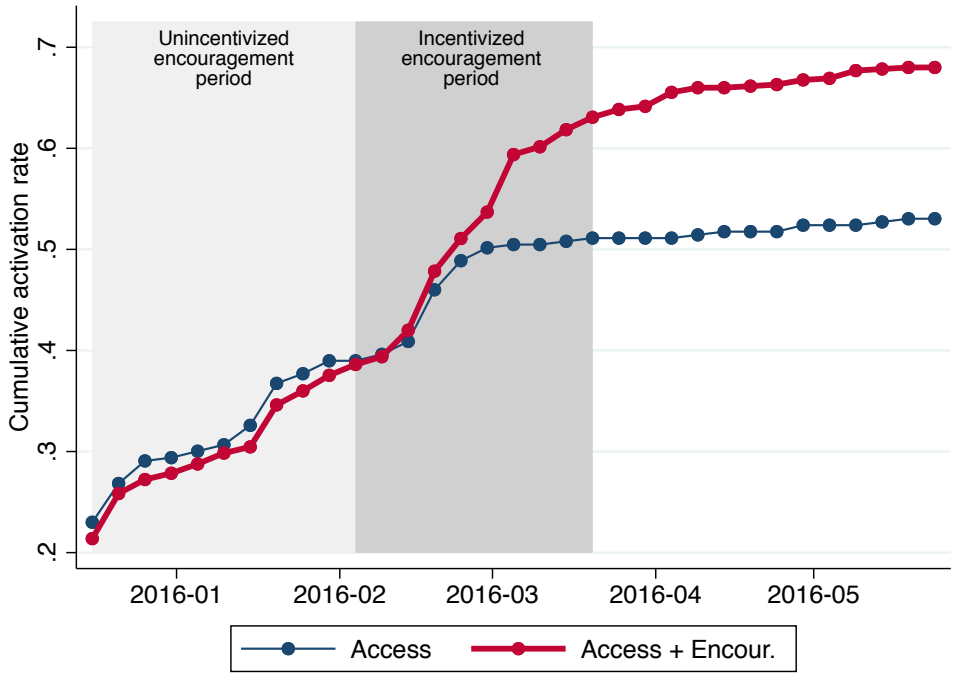

Figure A.4: Cumulative rate of activating censorship circumvention tool over time, among students who received only the access treatment (*Group-A*) and those who received both access and encoruagement treatments (*Group-AE*). Activation is an indicator equals 1 if students install the tool and use it at least once. *Group-A* students receive reminder to activate the tool at the same time of the *Group-AE* students receive encouragment treatment newsletters.

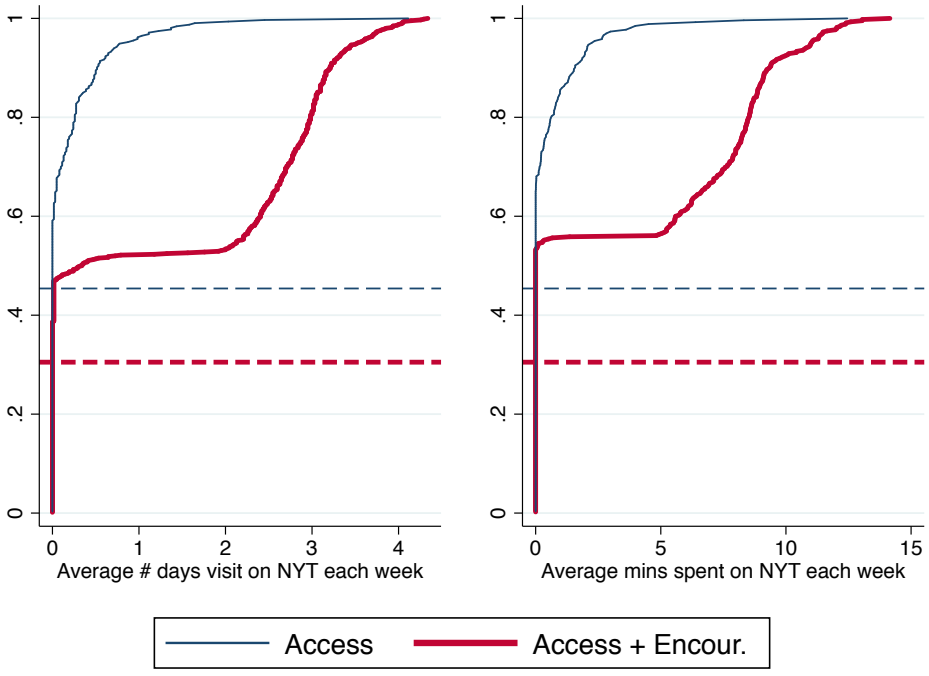

Figure A.5: Cumulative distribution plot of the average total number of days visiting the *New York Times* website (including both the English and Chinese edition) in a given week (left panel), and the average total browsing time on the *New York Times* website (right panel), among all students in the access treatment group *(A)* and the access + encouragement treatment group *(AE)*. The dashed horizontal lines indicate the percentage of sudents in *Group-A* and *Group-AE* who have not activated the access tool throughout the experiment.

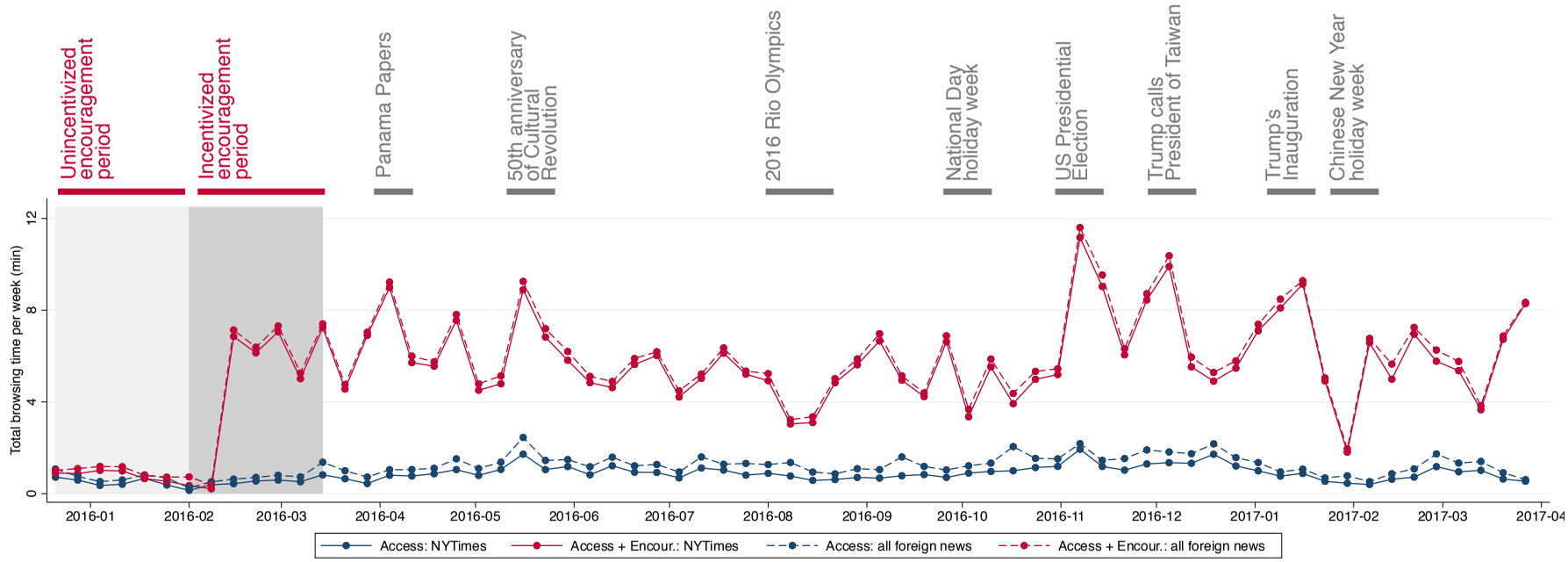

Figure A.6: Average total browsing time (minutes) on the *New York Times* and all top foreign news websites per week, among students received only the access treatment (*Group-A*) and those who received both access and encouragement treatments (*Group-AE*). *New York Times* browsing time includes both its English and Chinese websites. Top foriegn news websites are defined based on Alexa Top Websites categorization, which include CNN, The Guardian, Huffington Post, Fox News, The BBC, The Economist, Bloomberg, The Wall Street Journal, USA Today, Reuters, NBC News, Financial Times, and Reddit.

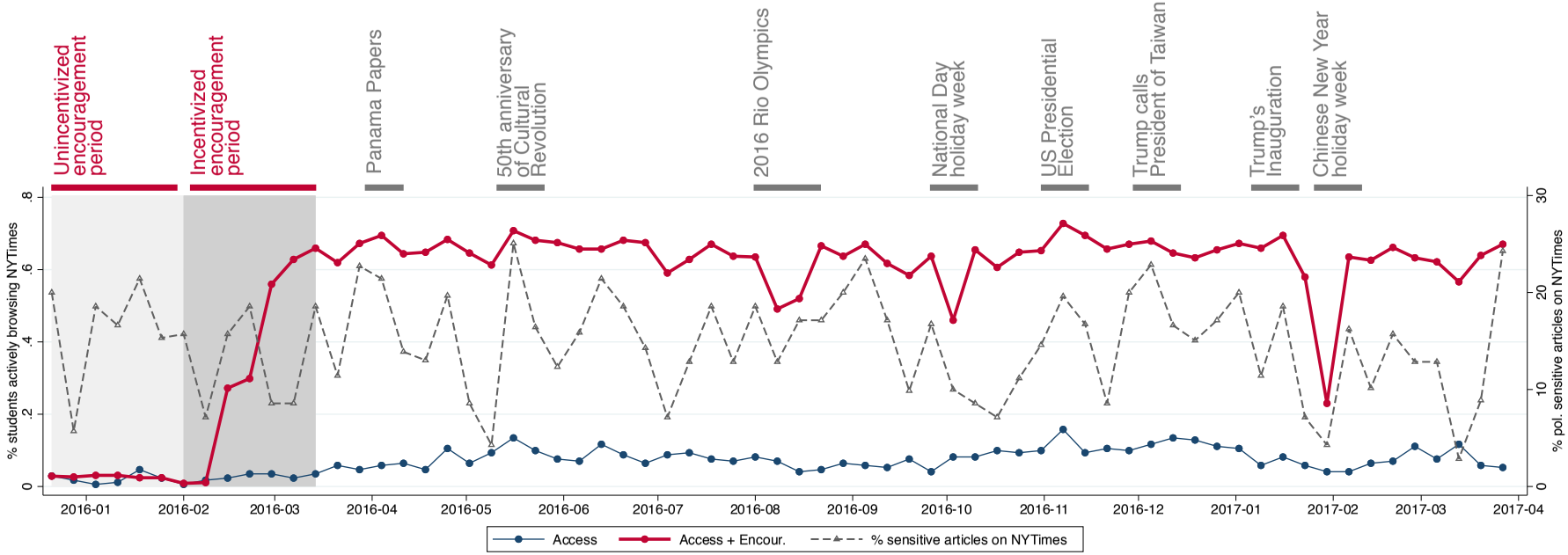

Figure A.7: Average proportion of students actively browsing the *New York Times* website (including both its English and Chinese edition) per week, among students received only the access treatment (*Group-A*) and those who received both access and encouragement treatments (*Group-AE*). A student actively browses the *New York Times* in a given week if she visits the *New York Times* on at least two days out of the week. Dotted line (y-axis on the right hand side) indicates the proportion of articles published on the *New York Times* that are politically sensitive during that corresponding week.

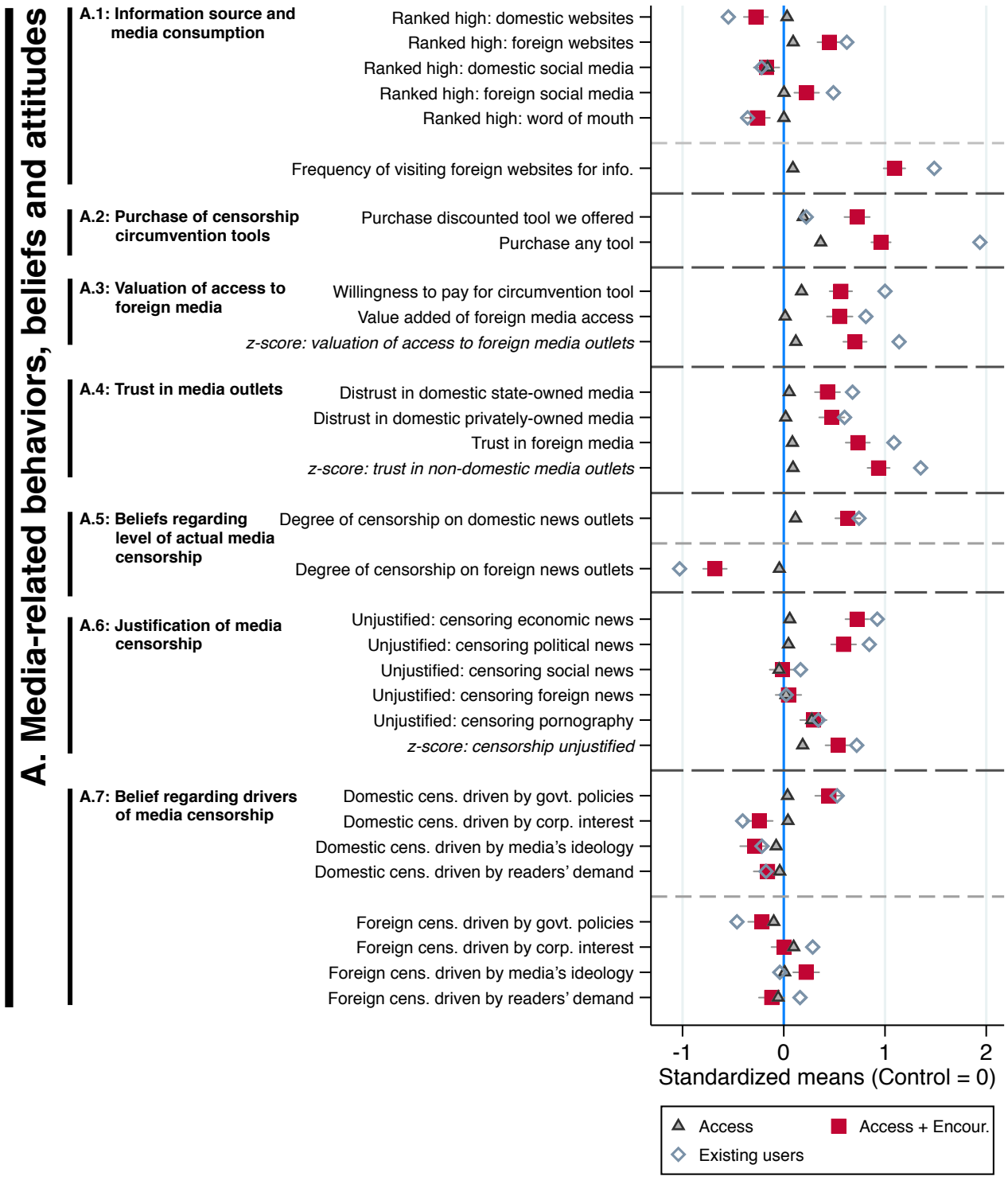

Figure A.8: Comparison of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) and the existing users. The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-AE* students. Sample is restricted to 1,372 students who have completed the endline survey.

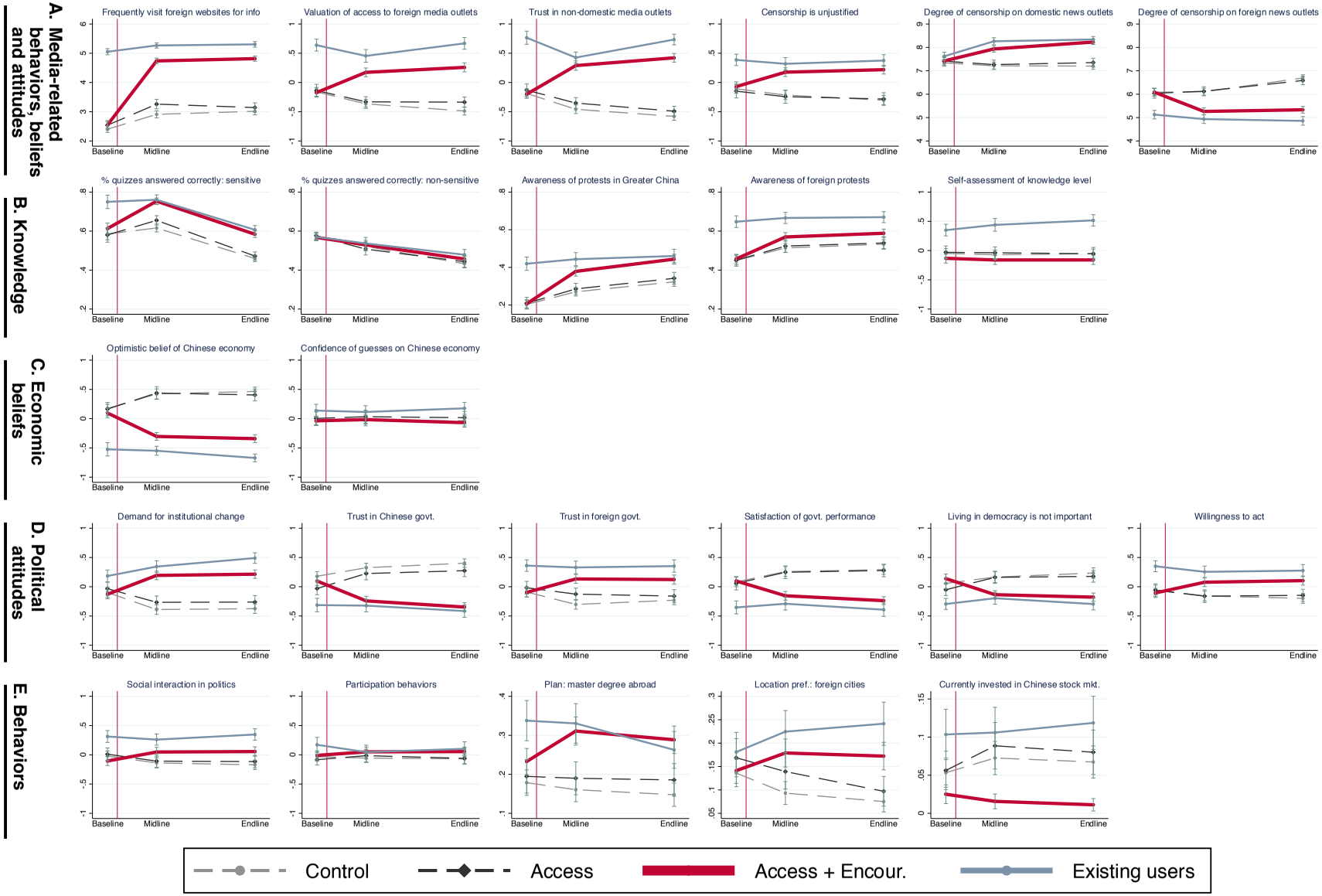

Figure A.9: Average level of outcomes elicited in the panel survey, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) and the existing users, across the baseline survey (November 2015), midline survey (May 2016), and endline survey (April 2017). If there are multiple survey questions elicited within a category or subcategory of outcomes, results are shown using a z-score index aggregating all corresponding questions. The z-score index (weighting by the inverse covariance of the standardized variables) is computed following Anderson (2008). Sample is restricted to 1,372 students who have completed the endline survey.

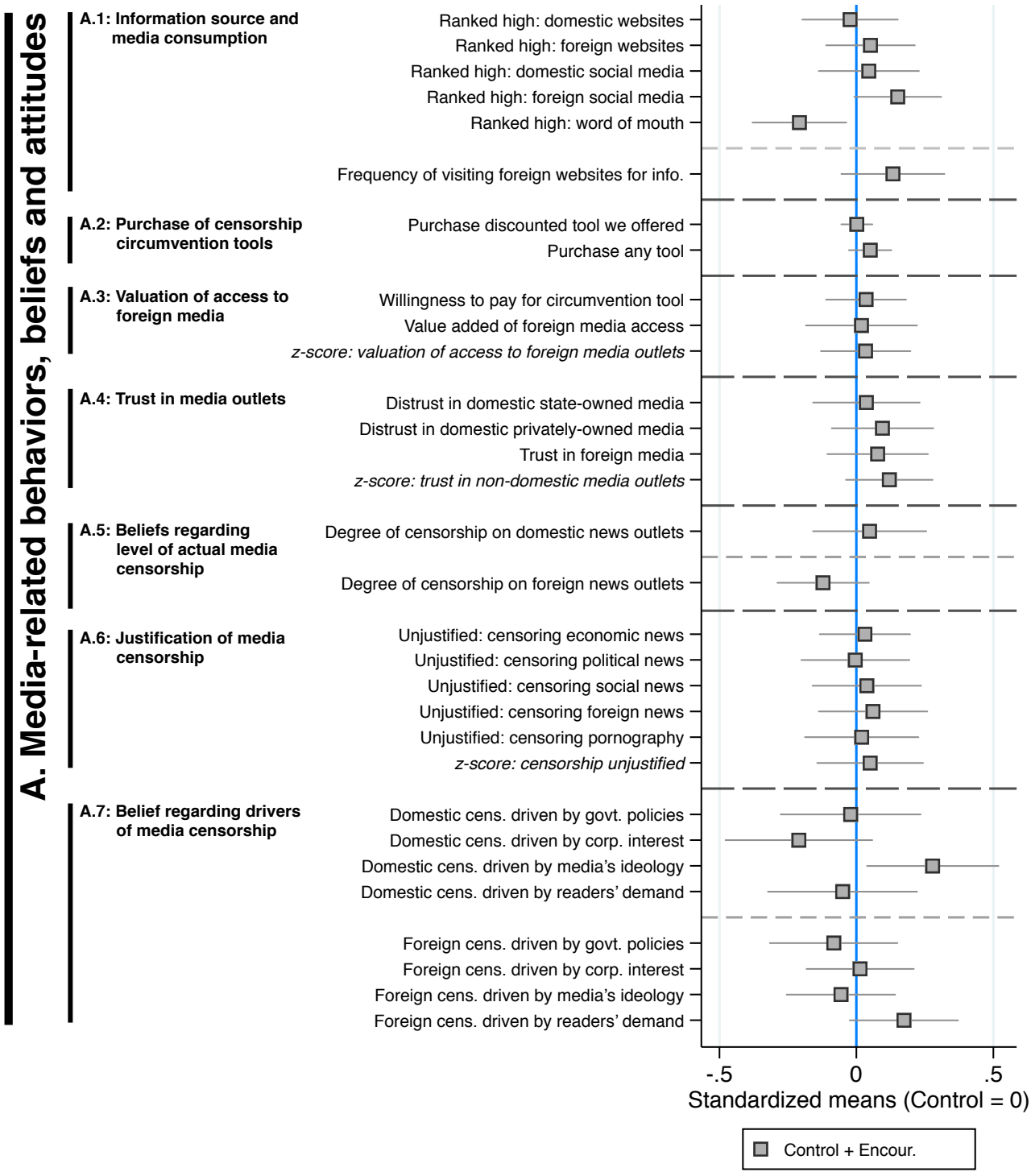

Figure A.10: Comparison of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

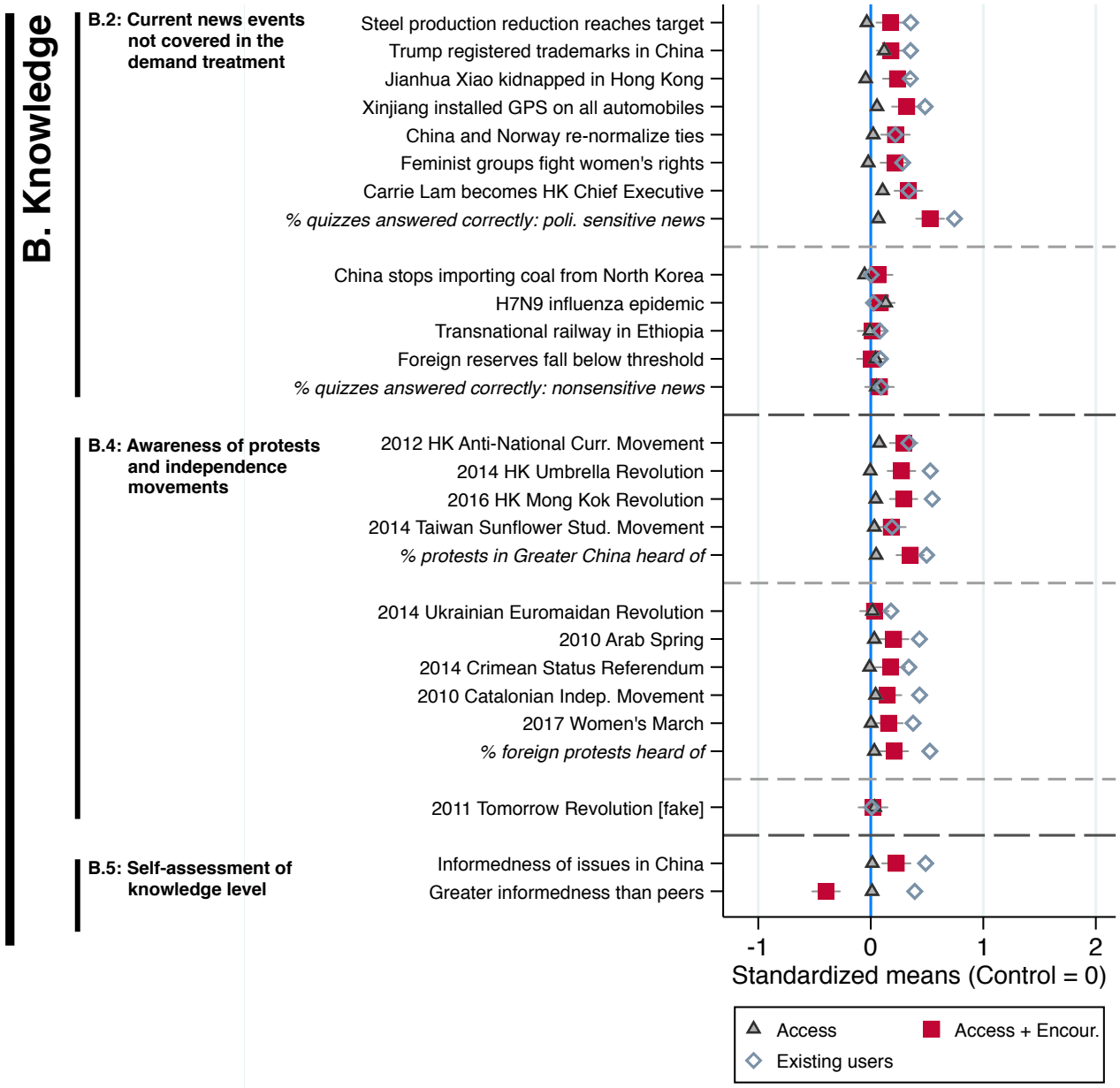

Figure A.11: Comparison of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) and the existing users. The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-AE* students. Sample is restricted to 1,372 students who have completed the endline survey.

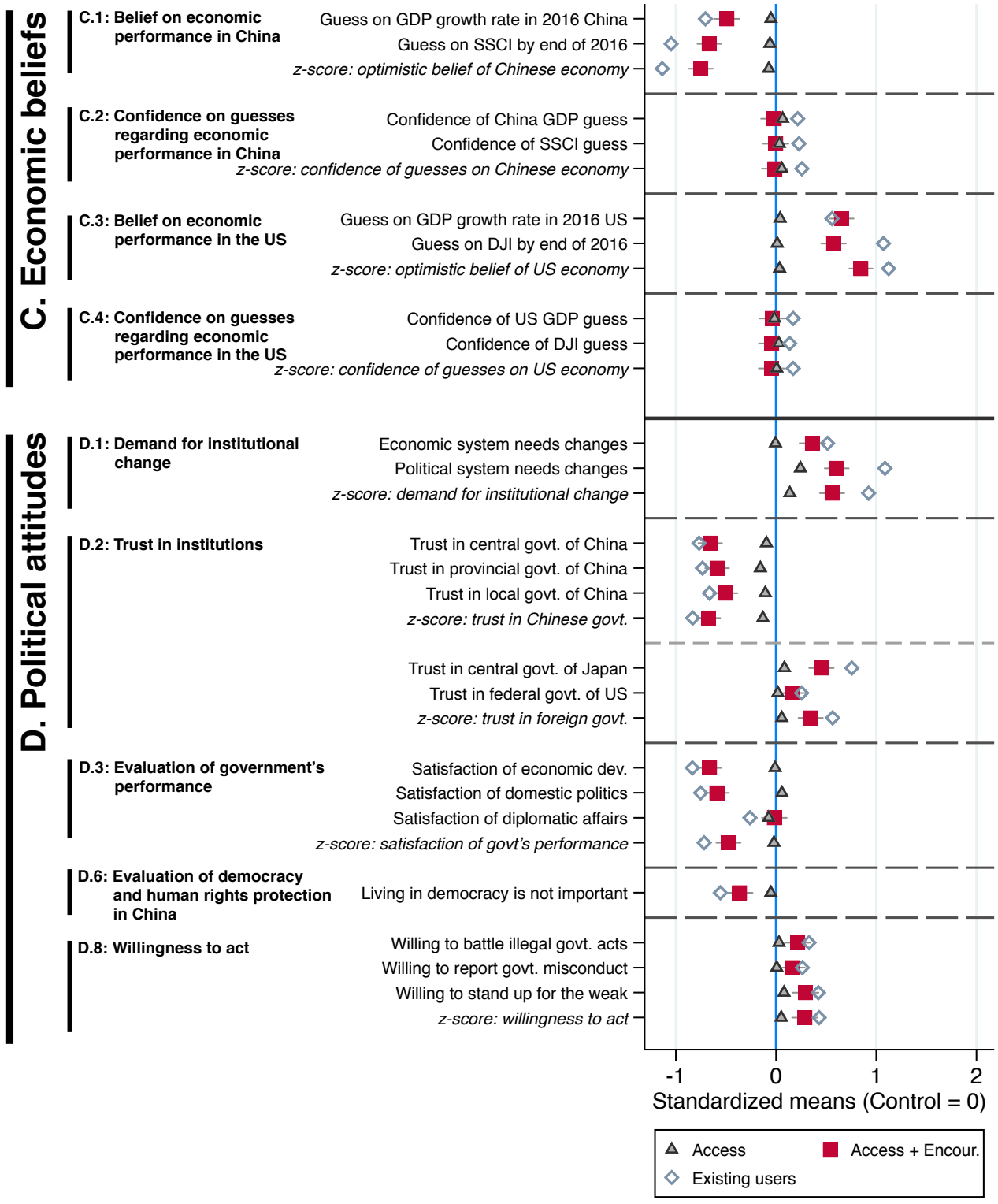

Figure A.12: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) and the existing users. The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-AE* students. Sample is restricted to 1,372 students who have completed the endline survey.

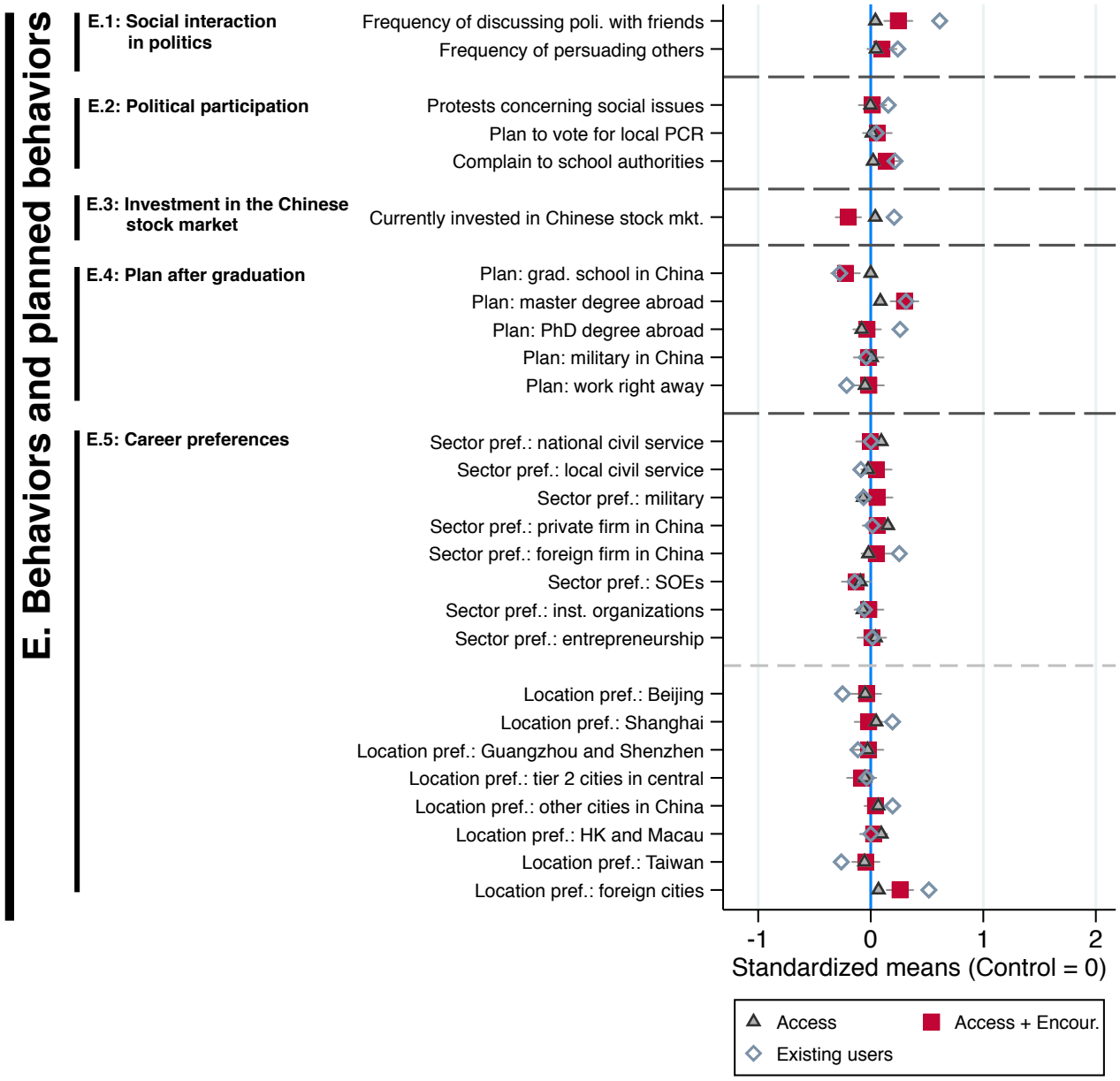

Figure A.13: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) and the existing users. The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-AE* students. Sample is restricted to 1,372 students who have completed the endline survey.

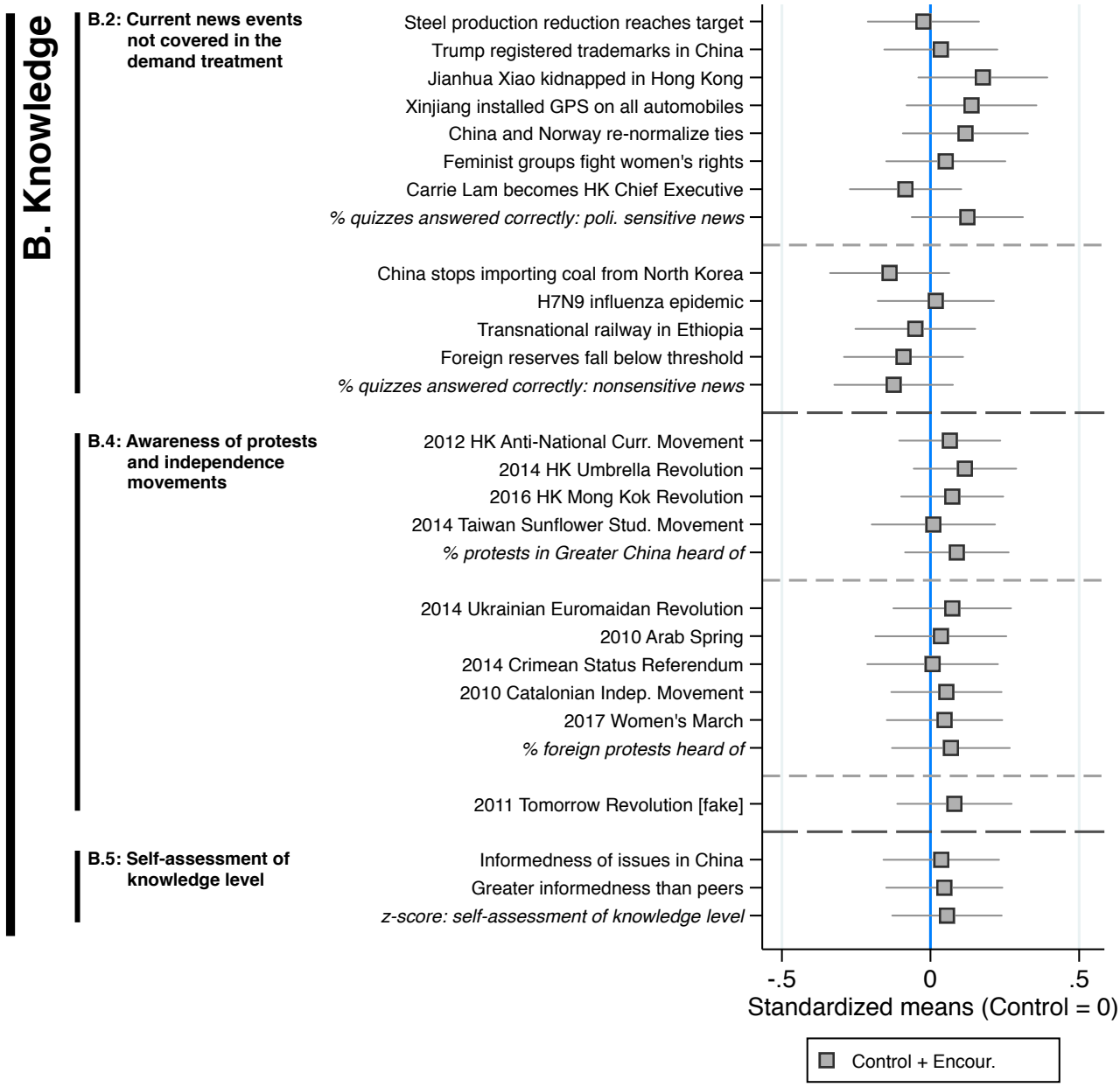

Figure A.14: Comparison of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

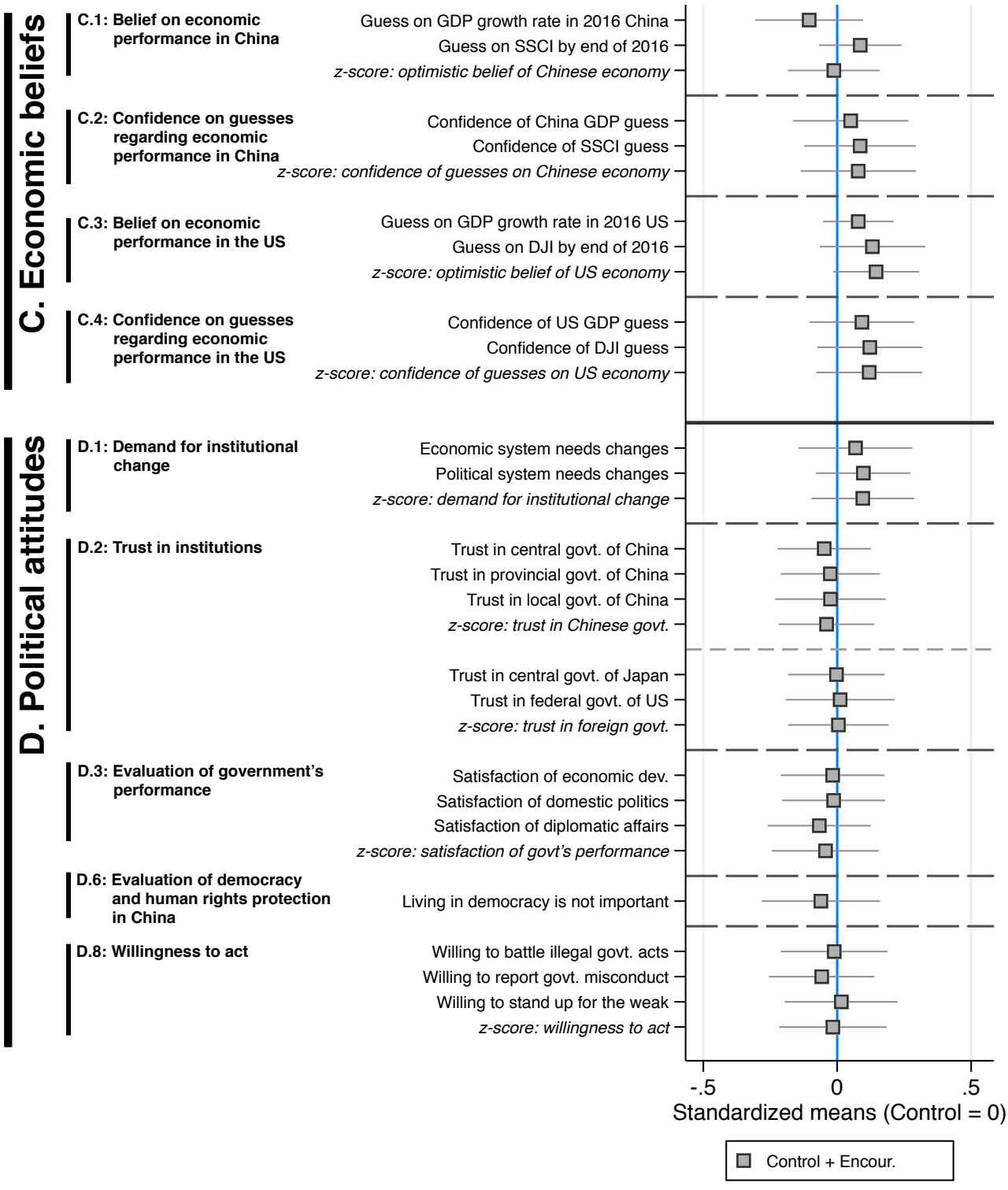

Figure A.15: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

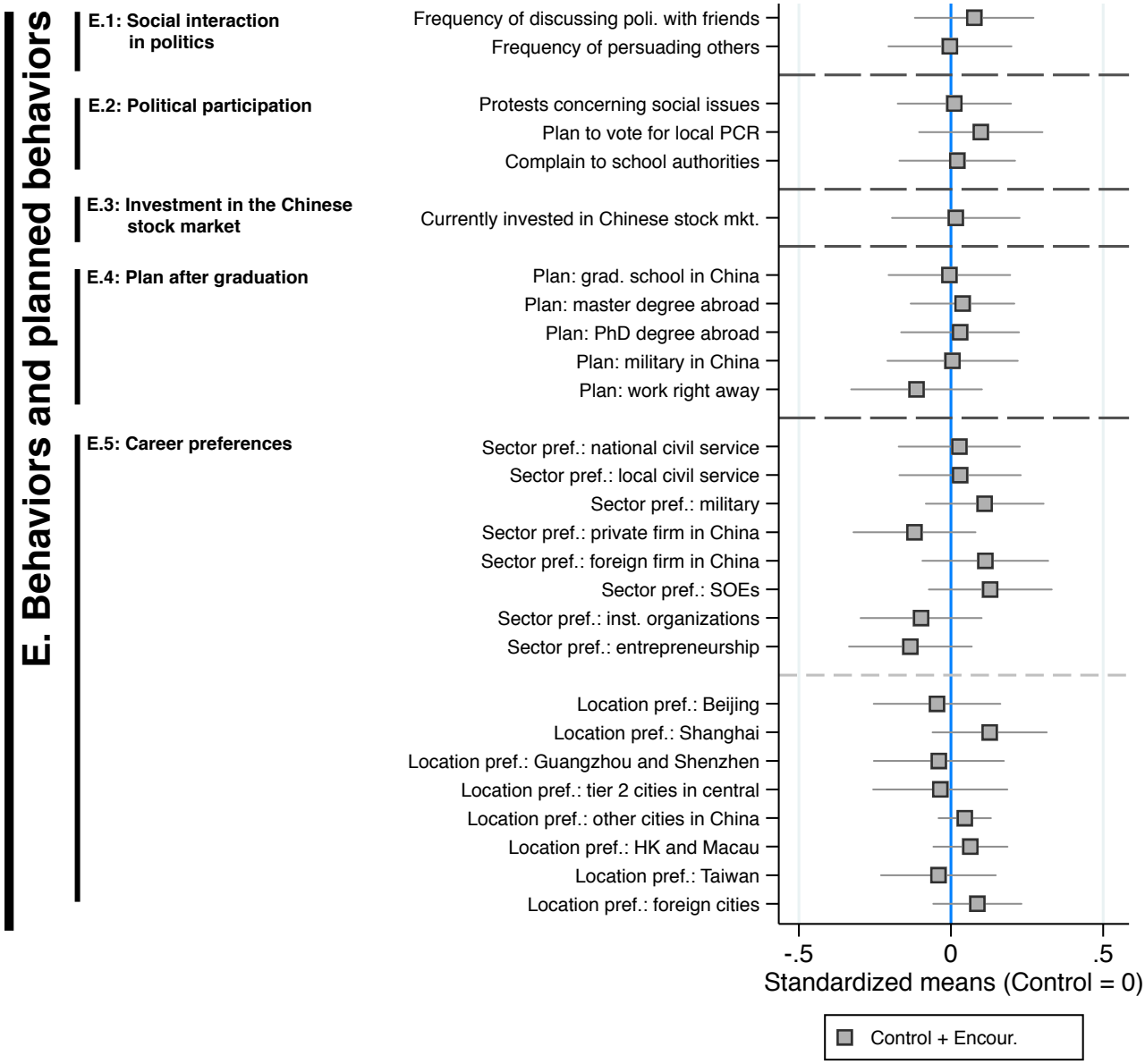

Figure A.16: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

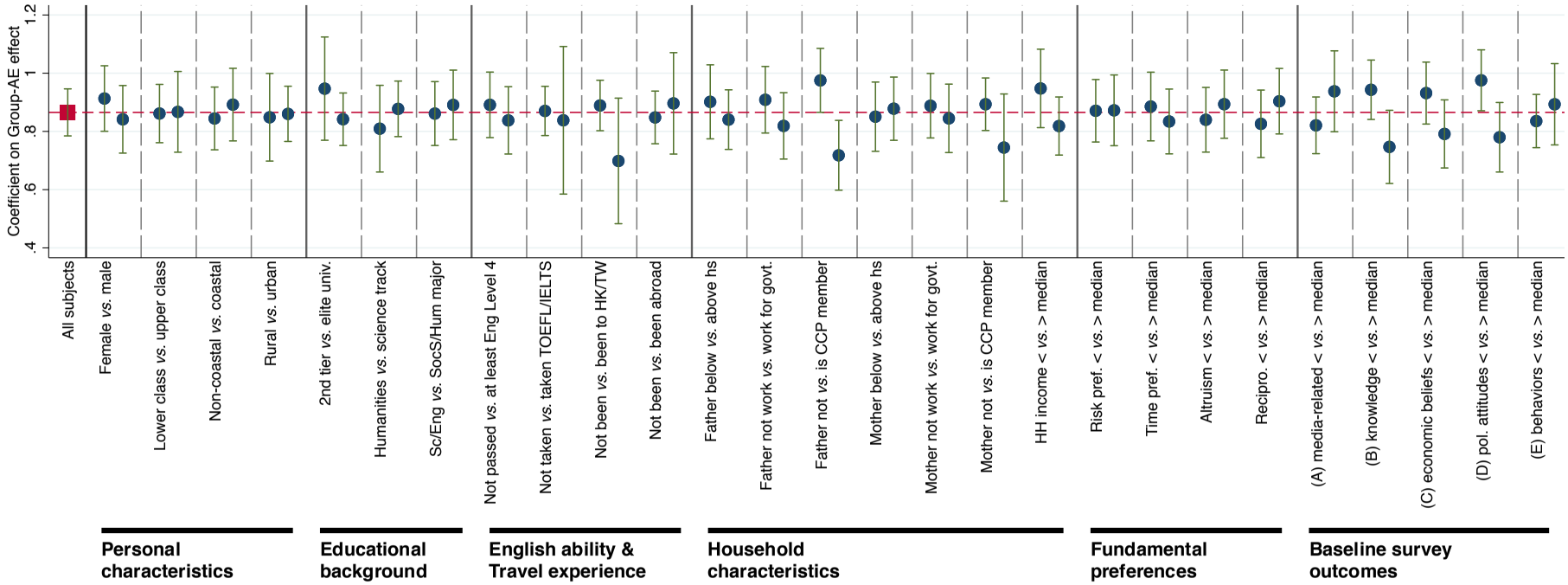

Figure A.17: Treatment effect of access and encuragement treatments combined *(AE)* on an z-score index that summarizes all 5 categories of outcomes of interests elicited at the endline survey (media-related behaviors, beliefs and attitudes; knowledge; economic beliefs; political attitudes; and behaviors and planned behaviors), estimated on all subjects and various sub-samples, pooling students from the control *(C)*, control + encouragement *(CE)*, and access *(A)* groups together as the omitted group in order to maximize the statistical power of heterogeneity analyses. Corresponding regression coefficients and the 95% confidence interval constructed from the robust standard error on the *Group-AE* indicator are shown. Subsample regression coefficients on the subgroups described before "vs." are shown first in the coeffient pairs. Coefficients are estimated using 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey.

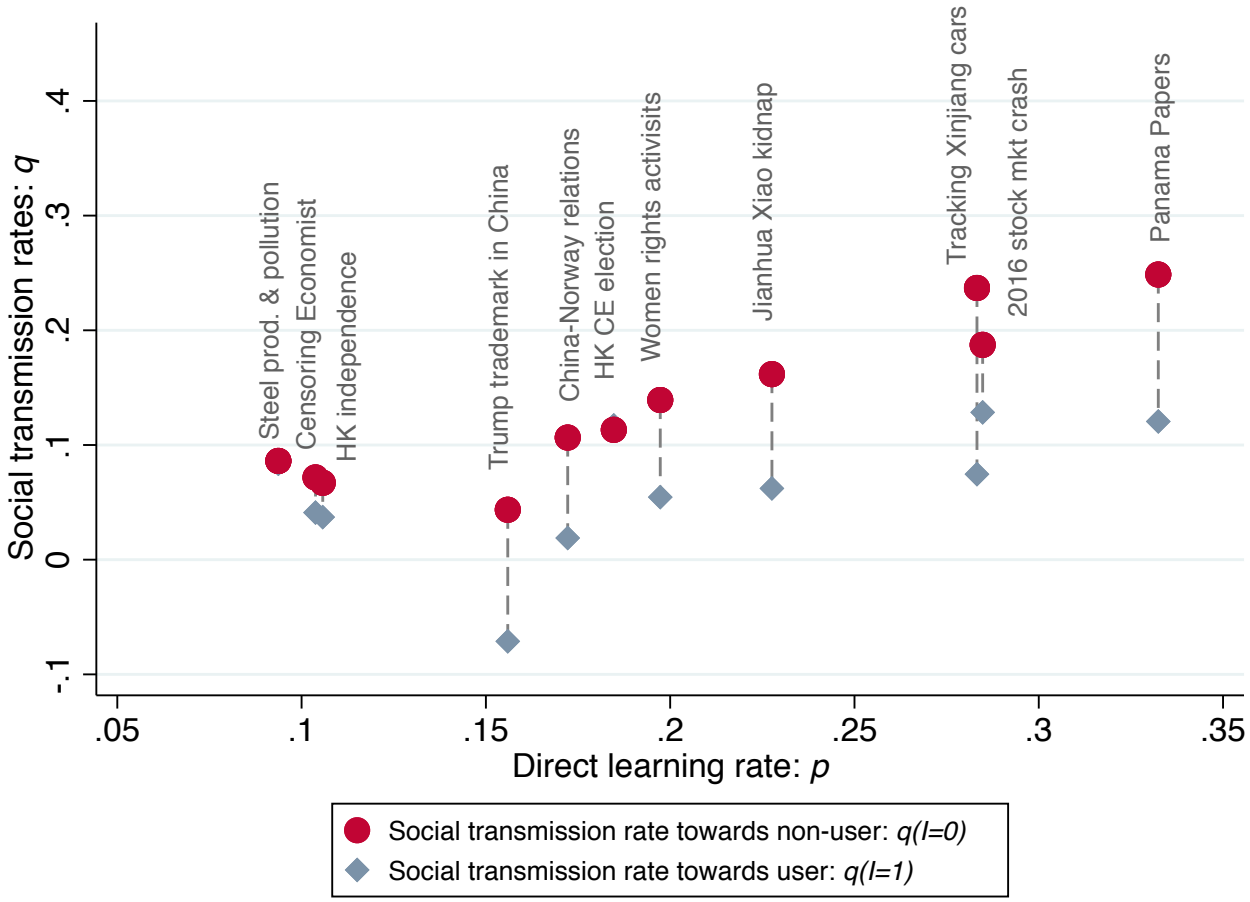

Figure A.18: Estimated social transmission rates towards roommates who are not actively browsing foreign news websites themselves ($q(I = 0)$; red circle), and towards roommates who are actively browsing foreign news websites ($q(I = 1)$; blue diamond), across quizzes on 11 politically sensitive news events, ranked by their estimated direct learning rates (p). Model parameters are jointly estimated with nonlinear least square method. Estimation of social learning parameters is conducted on students who have completed the corresponding wave of the survey, and have no roommates who were existing users of the censorship circumvention tool prior to the baseline survey (November 2015), and have either 0 or 1 roommates who are actively use censorship circumvention tool as a result of the experimental treatment.

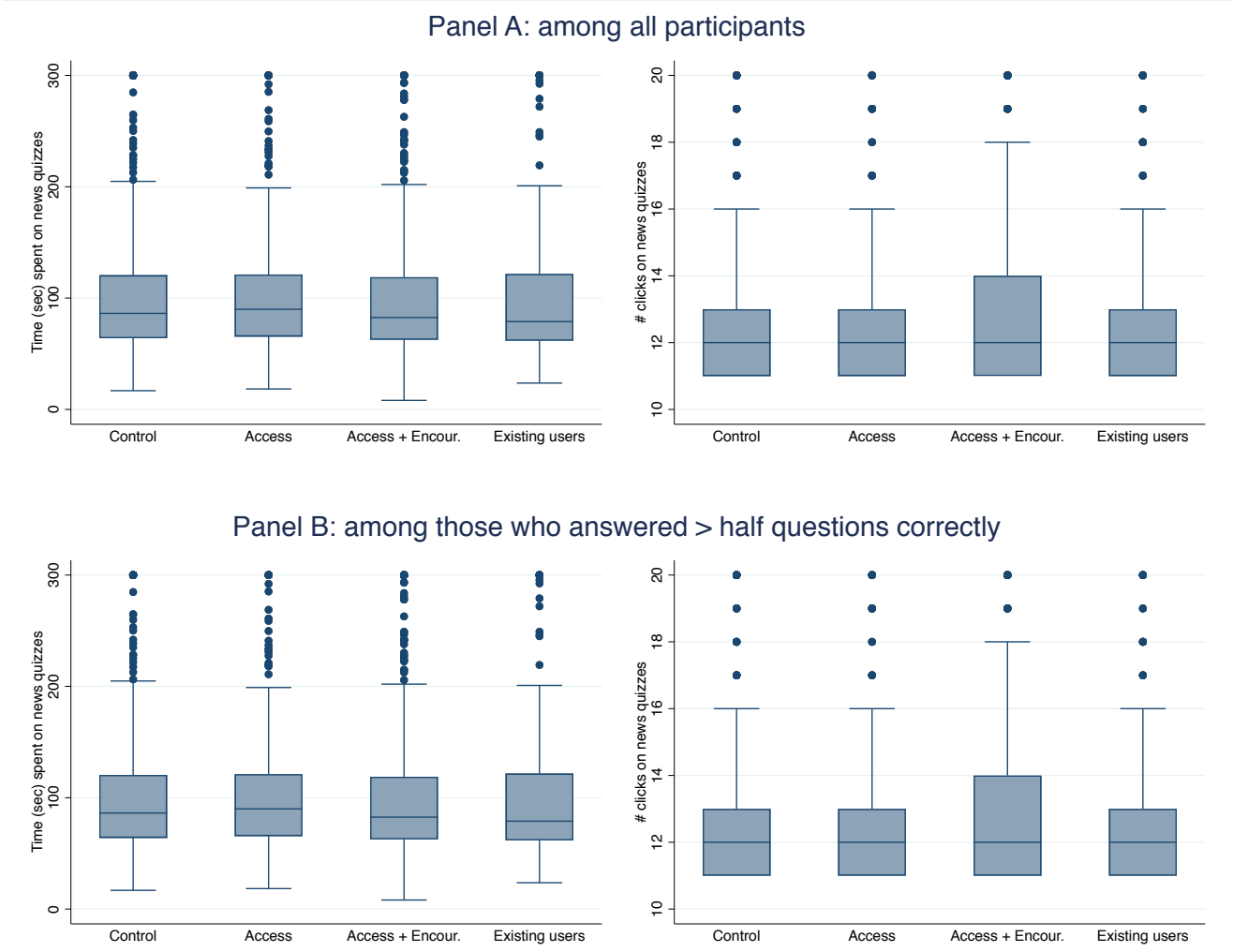

Figure A.19: Time spent during midline survey (May 2016) modules on news quizzes, as well as the total number of clicks recorded during the survey prior to submission, across students in the control *(C)*, access *(A)* and access + encouragement *(AE)* groups, and existing users. Panel A shows results among all 1,617 students who have completed midline survey; Panel B shows results, restricting the sample to students who are able to answer more than half of the questions correctly.

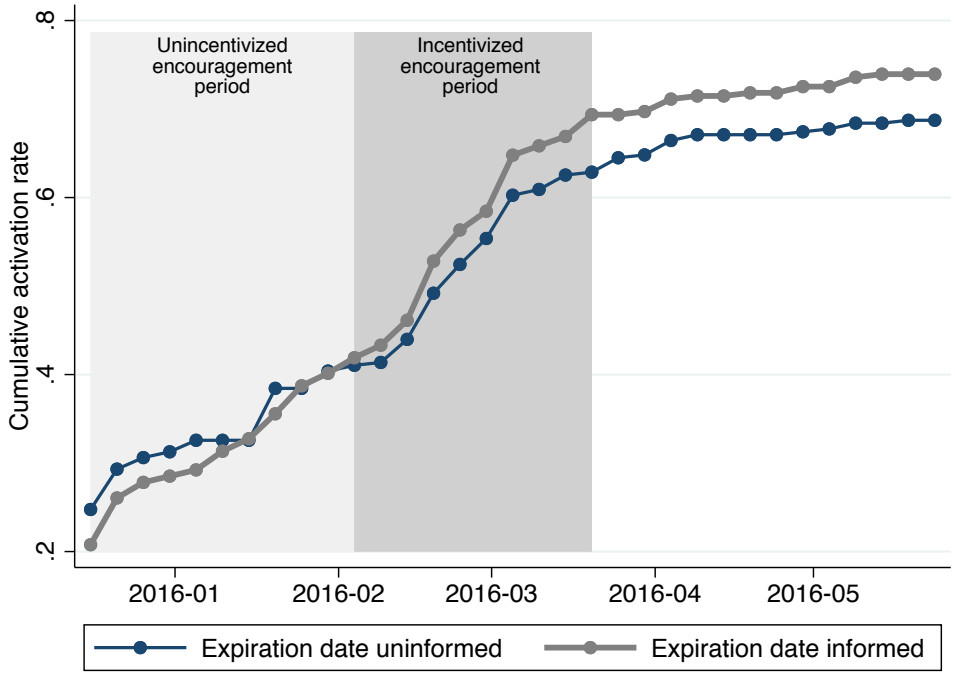

Figure A.20: Cumulative rate of activating censorship circumvention tool over time, among students who are randomly assigned with an explicitly mentioned deadline for their free subscription of censorship circumvention tool, and those to whom we did not explicitly mention the deadline. Activation is an indicator equals 1 if students install the tool and use it at least once.

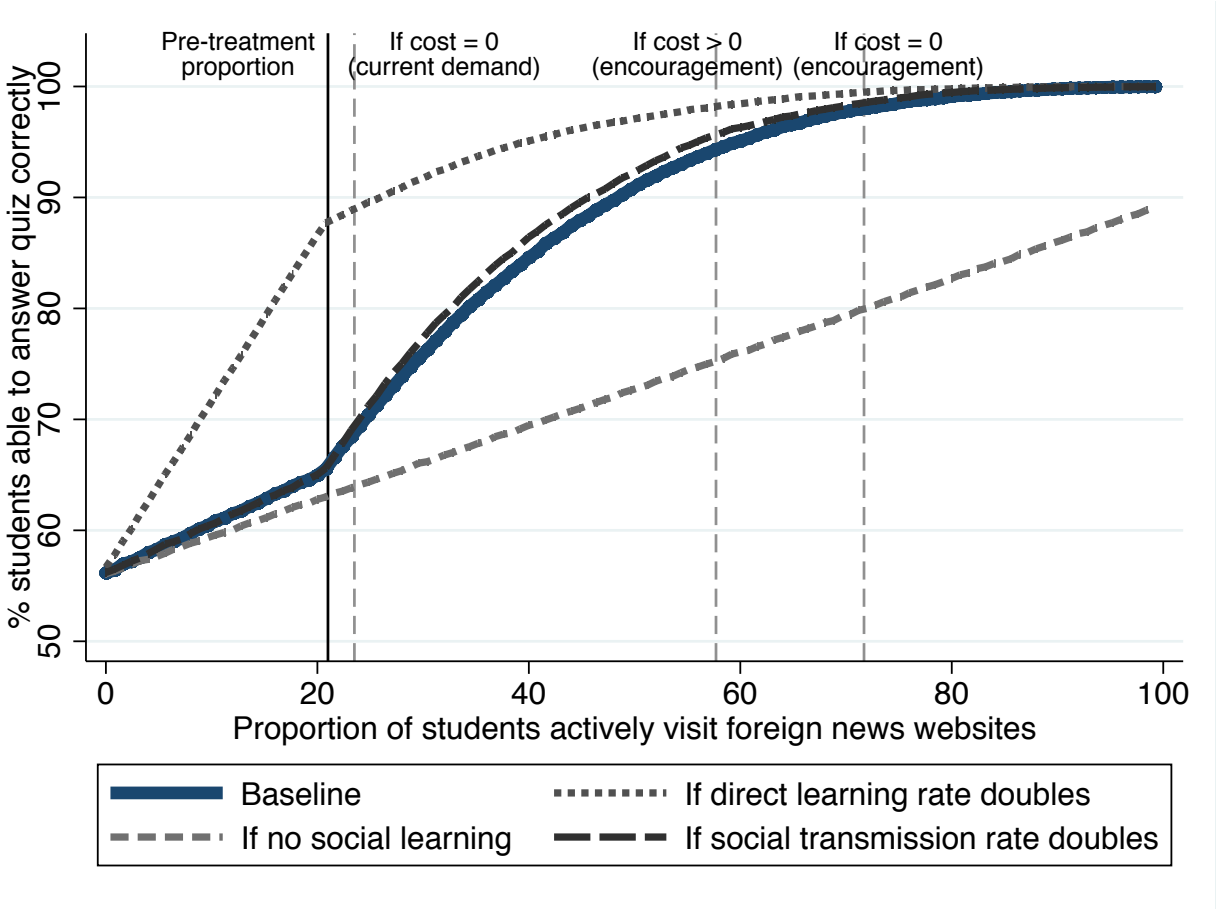

Figure A.21: Simulation of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%, with a set of alternative specifications related to the model parameters on direct learning and social transmission of information. Details of the simulation procedure is described in Appendix I.

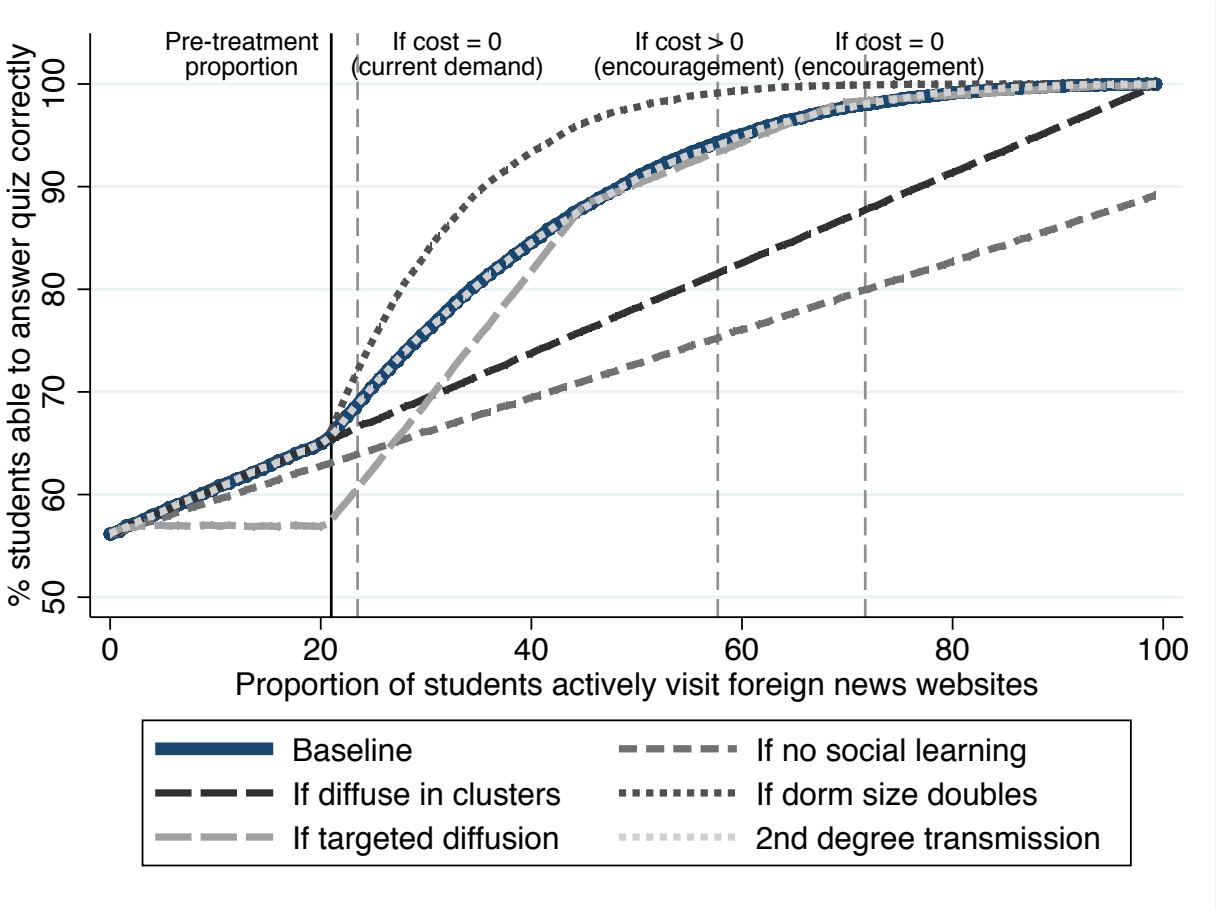

Figure A.22: Simulation *(continued)* of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%, with a set of alternative specifications related to the diffusion process of the access tool and the underlying social learning environment. Details of the simulation procedure is described in Appendix I.

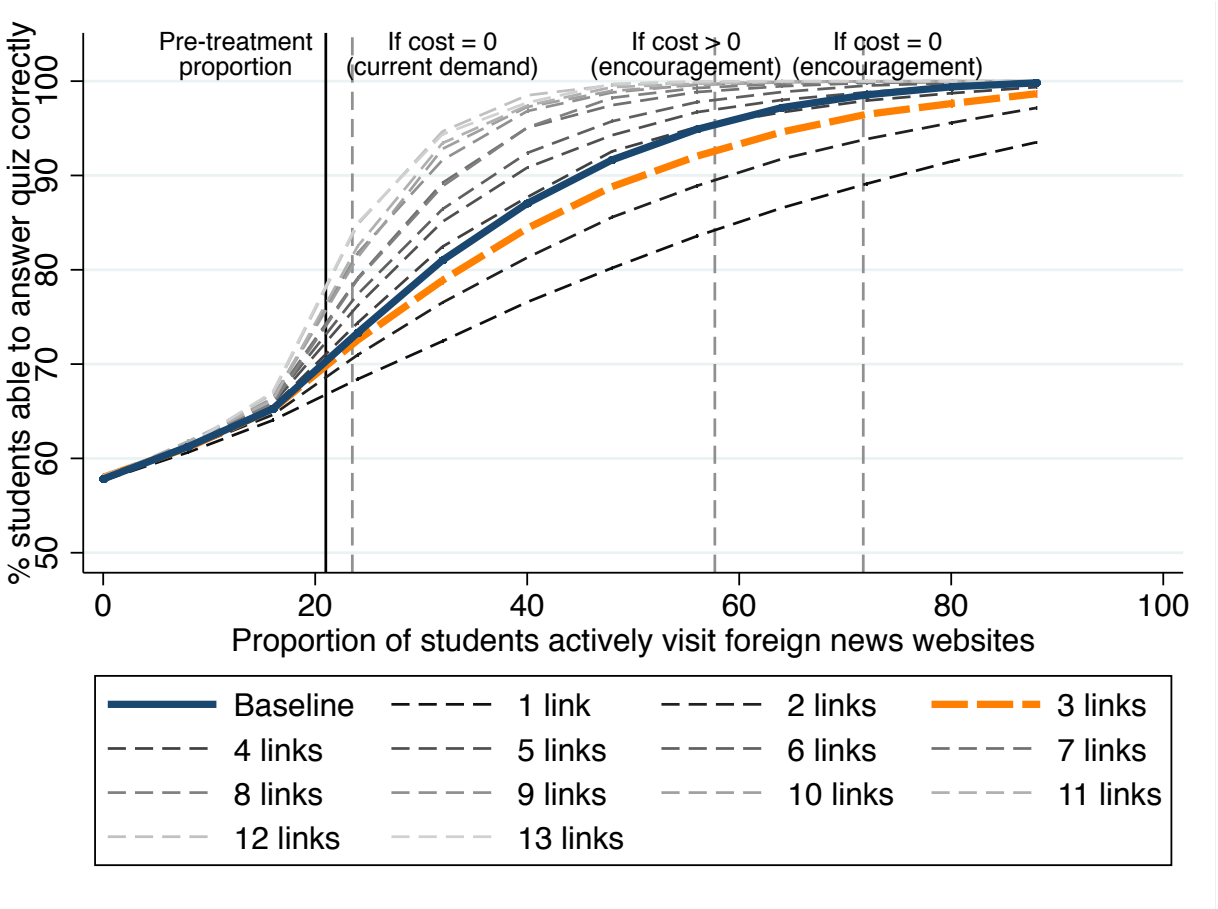

Figure A.23: Simulation *(continued)* of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%, with a set of alternative spefications that incorporate the full conversation networks among the student population. Details of the simulation procedure is described in Appendix I.

Table A.1: Summary statistics & balance tests - baseline participants

	All		Exg users	C	CE	A	AE	ANOVA test	
	Mean	Std.Dev.	Mean	Mean	Mean	Mean	Mean	F-stat	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Category 1: *Personal characteristics*									
Male	0.559	0.497	0.598	0.543	0.575	0.582	0.524	1.272	0.282
Birth year	1995.8	1.278	1995.8	1995.8	1995.8	1995.7	1995.8	0.980	0.401
Height	170.1	9.311	170.6	169.1	170.2	170.4	169.8	0.874	0.454
Han ethnicity	0.912	0.283	0.927	0.897	0.899	0.914	0.914	0.311	0.818
Born in coastal province	0.417	0.493	0.450	0.395	0.387	0.447	0.408	0.899	0.441
Resided in coastal province	0.444	0.497	0.480	0.395	0.412	0.492	0.434	2.033	0.107
Urban hukou prior to college	0.784	0.412	0.861	0.735	0.768	0.732	0.791	1.763	0.152
Religious	0.066	0.248	0.045	0.054	0.085	0.080	0.063	0.945	0.418
Member of CCP *[at baseline]*	0.068	0.252	0.066	0.049	0.070	0.058	0.078	0.920	0.430
z-score: personal characteristics	0.000	1.000	0.111	-0.140	-0.001	-0.036	-0.000	0.945	0.418
Category 2: *Educational background*									
Elite university	0.825	0.380	0.973	0.827	0.765	0.789	0.795	0.950	0.415
Science track in high school	0.731	0.444	0.704	0.708	0.793	0.732	0.720	2.359	0.070
SoSc./Hum. major at college	0.450	0.498	0.469	0.449	0.475	0.435	0.435	0.523	0.666
z-score: educational background	0.000	1.000	0.127	-0.061	0.128	-0.066	-0.080	3.276	0.020
Category 3: *English ability and oversea travel experiences [at baseline]*									
At least Level 4 certi. in English	0.514	0.500	0.535	0.497	0.482	0.527	0.518	0.573	0.632
Taken TOEFL or IELTS	0.131	0.337	0.178	0.092	0.125	0.128	0.122	0.552	0.647
z-score: English ability	0.053	1.035	0.174	-0.046	0.001	0.064	0.040	0.565	0.638
Traveled to HK, Macau, Taiwan	0.185	0.388	0.275	0.135	0.162	0.160	0.177	0.653	0.581
Traveled to foreign countries	0.248	0.432	0.341	0.216	0.204	0.217	0.248	0.944	0.418
z-score: oversea travel experiences	0.000	1.000	0.274	-0.125	-0.100	-0.084	-0.014	1.045	0.371
Category 4: *Household characteristics*									
Total # siblings	0.535	1.103	0.393	0.638	0.616	0.521	0.545	0.700	0.552
Father educ. above hs.	0.676	0.468	0.743	0.638	0.670	0.665	0.660	0.200	0.897
Father works related to govt.	0.493	0.500	0.511	0.481	0.497	0.482	0.489	0.061	0.980
Father member of CCP	0.428	0.495	0.420	0.373	0.445	0.387	0.458	2.445	0.062
Mother educ. above hs.	0.605	0.489	0.671	0.616	0.588	0.594	0.582	0.248	0.863

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	All		Exg users	C	CE	A	AE	ANOVA test	
	Mean	Std.Dev.	Mean	Mean	Mean	Mean	Mean	F-stat	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mother works related to govt.	0.486	0.500	0.529	0.470	0.497	0.486	0.465	0.349	0.790
Mother member of CCP	0.225	0.418	0.236	0.157	0.229	0.233	0.234	1.794	0.146
Total hh income in 2015	147856	187049	180763	146703	136738	142029	139842	0.130	0.942
z-score: household characteristics	0.000	1.000	0.033	-0.022	0.040	-0.043	-0.010	0.379	0.768
Category 5: *Fundamental preferences*									
Willingness to take risk	5.678	1.948	5.888	5.838	5.576	5.527	5.649	1.074	0.359
Cert. equiv. of lottery choices	11.43	5.963	11.94	10.76	11.73	11.94	10.98	2.809	0.038
Prefer risky lottery options	3.595	1.272	3.604	3.486	3.588	3.693	3.578	1.108	0.345
z-score: risk preferences	0.000	1.000	0.096	-0.047	-0.002	0.024	-0.046	0.402	0.751
Willingness to wait for future	6.028	2.162	6.281	5.865	6.061	5.933	5.974	0.364	0.779
Tendency not to procrastinate	5.107	2.895	5.151	5.065	5.018	4.971	5.208	0.601	0.614
z-score: time preferences	0.000	1.000	0.097	-0.066	-0.011	-0.067	0.007	0.522	0.667
Willingness to give to good causes	6.919	2.264	6.792	7.005	7.037	6.895	6.912	0.320	0.810
Amount willing to donate	2608.7	2329.8	2458.4	2692.7	2786.9	2657.7	2547.9	0.780	0.505
z-score: altruism	0.000	1.000	-0.075	0.046	0.080	0.006	-0.018	0.758	0.518
Willingness to return favor	8.868	1.276	8.677	8.908	8.973	8.920	8.877	0.415	0.742
Belief that others are well-intended	5.822	2.650	5.414	6.178	5.729	5.764	6.005	1.724	0.160
Willingness to give thank-you gift	5.364	1.254	5.356	5.611	5.360	5.339	5.311	2.837	0.037
Punish who treat self unfairly	5.442	2.432	5.571	5.384	5.485	5.403	5.391	0.125	0.945
Punish who treat others unfairly	4.572	2.322	4.637	4.514	4.549	4.629	4.538	0.137	0.938
Willingness to take revenge	3.507	2.364	3.634	3.616	3.287	3.476	3.538	1.052	0.368
z-score: reciprocity	0.000	1.000	-0.087	0.160	-0.021	-0.010	0.014	1.454	0.225
# of obs.	1807		331	185	328	313	650	–	–

Notes: ANOVA tests are conducted against the null hypothesis that corresponding characteristics of Group-N, Group-A, Group-NE, and Group-AE are not different from each other. Sample are restricted to 1,807 students who have completed baseline survey.

Table A.2: Summary statistics & balance tests - midline participants

	All		Exg users	C	CE	A	AE	ANOVA test	
	Mean	Std.Dev.	Mean	Mean	Mean	Mean	Mean	F-stat	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Category 1: *Personal characteristics*									
Male	0.561	0.496	0.602	0.522	0.591	0.579	0.524	1.631	0.180
Birth year	1995.8	1.261	1995.9	1995.9	1995.8	1995.7	1995.8	0.874	0.454
Height	170.0	9.407	170.8	168.6	170.2	170.3	169.8	1.204	0.307
Han ethnicity	0.910	0.287	0.925	0.894	0.895	0.913	0.912	0.396	0.756
Born in coastal province	0.412	0.492	0.441	0.412	0.378	0.450	0.396	1.173	0.319
Resided in coastal province	0.439	0.496	0.474	0.406	0.401	0.491	0.423	1.987	0.114
Urban hukou prior to college	0.782	0.413	0.856	0.753	0.757	0.720	0.796	2.135	0.094
Religious	0.069	0.253	0.046	0.059	0.089	0.080	0.068	0.670	0.571
Member of CCP *[at baseline]*	0.066	0.248	0.062	0.041	0.072	0.052	0.078	1.396	0.242
z-score: personal characteristics	-0.002	1.010	0.103	-0.137	-0.005	-0.061	0.013	1.046	0.371
Category 2: *Educational background*									
Elite university	0.835	0.371	0.971	0.835	0.776	0.803	0.810	0.890	0.446
Science track in high school	0.730	0.444	0.709	0.694	0.789	0.716	0.726	2.277	0.078
SoSc./Hum. major at college	0.449	0.498	0.468	0.470	0.470	0.437	0.426	0.674	0.568
z-score: educational background	0.005	0.994	0.136	-0.043	0.122	-0.085	-0.069	2.781	0.040
Category 3: *English ability and oversea travel experiences [at baseline]*									
At least Level 4 certi. in English	0.511	0.500	0.526	0.488	0.480	0.519	0.524	0.627	0.598
Taken TOEFL or IELTS	0.130	0.336	0.180	0.100	0.121	0.128	0.117	0.284	0.837
z-score: English ability	-0.005	1.004	0.107	-0.090	-0.059	0.001	-0.014	0.448	0.719
Traveled to HK, Macau, Taiwan	0.182	0.386	0.281	0.135	0.155	0.159	0.170	0.407	0.748
Traveled to foreign countries	0.241	0.428	0.327	0.212	0.191	0.218	0.243	1.069	0.361
z-score: oversea travel experiences	-0.014	0.992	0.264	-0.131	-0.130	-0.084	-0.032	0.921	0.430
Category 4: *Household characteristics*									
Total # siblings	0.539	1.094	0.402	0.600	0.612	0.550	0.549	0.274	0.844
Father educ. above hs.	0.678	0.467	0.745	0.647	0.668	0.671	0.661	0.109	0.955
Father works related to govt.	0.486	0.500	0.510	0.482	0.493	0.464	0.482	0.179	0.911
Father member of CCP	0.427	0.495	0.418	0.376	0.454	0.377	0.460	2.670	0.046
Mother educ. above hs.	0.603	0.489	0.673	0.612	0.586	0.581	0.582	0.174	0.914

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	All		Exg users	C	CE	A	AE	ANOVA test	
	Mean	Std.Dev.	Mean	Mean	Mean	Mean	Mean	F-stat	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mother works related to govt.	0.484	0.500	0.536	0.471	0.500	0.467	0.458	0.470	0.703
Mother member of CCP	0.220	0.414	0.239	0.153	0.230	0.215	0.226	1.571	0.195
Total hh income in 2015	145759	184540	176805	147088	134605	139247	137632	0.183	0.908
z-score: household characteristics	-0.008	0.994	0.036	-0.043	0.036	-0.058	-0.020	0.480	0.696
Category 5: *Fundamental preferences*									
Willingness to take risk	5.672	1.949	5.846	5.824	5.586	5.526	5.651	0.889	0.446
Cert. equiv. of lottery choices	11.33	5.928	11.94	10.33	11.69	12.02	10.75	4.598	0.003
Prefer risky lottery options	3.603	1.265	3.614	3.465	3.612	3.713	3.577	1.487	0.216
z-score: risk preferences	-0.007	1.002	0.089	-0.091	0.006	0.036	-0.062	0.906	0.437
Willingness to wait for future	6.053	2.160	6.222	5.841	6.141	5.965	6.020	0.757	0.518
Tendency not to procrastinate	5.119	2.918	5.095	5.053	5.053	5.042	5.232	0.419	0.739
z-score: time preferences	0.012	0.998	0.063	-0.077	0.025	-0.038	0.029	0.690	0.558
Willingness to give to good causes	6.929	2.259	6.804	7.000	6.997	6.886	6.964	0.150	0.930
Amount willing to donate	2598.2	2311.8	2469.4	2665.6	2833.5	2582.1	2527.1	1.152	0.327
z-score: altruism	0.000	0.998	-0.069	0.037	0.081	-0.016	-0.010	0.676	0.567
Willingness to return favor	8.868	1.264	8.680	8.953	8.970	8.886	8.880	0.443	0.723
Belief that others are well-intended	5.819	2.667	5.435	6.171	5.714	5.758	6.015	1.672	0.171
Willingness to give thank-you gift	5.364	1.247	5.373	5.665	5.359	5.318	5.292	4.059	0.007
Punish who treat self unfairly	5.465	2.437	5.595	5.406	5.523	5.384	5.422	0.188	0.904
Punish who treat others unfairly	4.572	2.324	4.611	4.488	4.592	4.606	4.547	0.113	0.952
Willingness to take revenge	3.534	2.361	3.696	3.635	3.306	3.439	3.589	1.179	0.317
z-score: reciprocity	0.006	1.002	-0.067	0.193	-0.014	-0.036	0.022	2.029	0.108
# of obs.	1617		306	170	304	289	548	–	–

Notes: ANOVA tests are conducted against the null hypothesis that corresponding characteristics of Group-C, Group-CE, Group-A, and Group-AE are not different from each other. Sample are restricted to 1,617 students who have completed midline survey.

Table A.3: Summary statistics & balance tests - endline participants

	All		Exg users	C	CE	A	AE	ANOVA test	
	Mean	Std.Dev.	Mean	Mean	Mean	Mean	Mean	F-stat	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Category 1: *Personal characteristics*									
Male	0.562	0.496	0.630	0.512	0.579	0.597	0.517	1.952	0.119
Birth year	1995.8	1.262	1995.9	1995.9	1995.8	1995.7	1995.8	1.364	0.252
Height	169.9	8.951	170.6	168.0	170.3	170.4	169.6	2.439	0.063
Han ethnicity	0.914	0.280	0.921	0.898	0.896	0.922	0.920	0.647	0.585
Born in coastal province	0.415	0.492	0.438	0.372	0.398	0.471	0.398	1.685	0.168
Resided in coastal province	0.439	0.496	0.474	0.358	0.413	0.512	0.420	3.399	0.017
Urban hukou prior to college	0.771	0.420	0.835	0.752	0.764	0.705	0.781	1.775	0.150
Religious	0.066	0.249	0.050	0.058	0.093	0.061	0.065	0.922	0.430
Member of CCP *[at baseline]*	0.064	0.245	0.058	0.044	0.066	0.057	0.076	0.706	0.549
z-score: personal characteristics	-0.016	1.013	0.106	-0.164	-0.004	-0.083	-0.009	1.014	0.386
Category 2: *Educational background*									
Elite university	0.823	0.382	0.971	0.810	0.784	0.779	0.796	0.227	0.878
Science track in high school	0.739	0.439	0.723	0.722	0.807	0.738	0.716	2.573	0.053
SoSc./Hum. major at college	0.426	0.495	0.420	0.394	0.461	0.413	0.425	0.661	0.576
z-score: educational background	-0.028	0.980	0.086	-0.140	0.157	-0.112	-0.109	4.830	0.002
Category 3: *English ability and oversea travel experiences [at baseline]*									
At least Level 4 certi. in English	0.509	0.500	0.488	0.504	0.471	0.537	0.527	0.929	0.426
Taken TOEFL or IELTS	0.122	0.327	0.153	0.088	0.112	0.139	0.112	0.829	0.478
z-score: English ability	-0.023	0.986	0.008	-0.094	-0.089	0.045	-0.019	1.020	0.383
Traveled to HK, Macau, Taiwan	0.176	0.381	0.264	0.131	0.135	0.164	0.171	0.825	0.480
Traveled to foreign countries	0.238	0.426	0.306	0.198	0.197	0.238	0.239	0.847	0.468
z-score: oversea travel experiences	-0.029	0.988	0.208	-0.158	-0.152	-0.048	-0.035	1.268	0.284
Category 4: *Household characteristics*									
Total # siblings	0.536	1.071	0.393	0.628	0.644	0.549	0.518	0.920	0.431
Father educ. above hs.	0.671	0.470	0.727	0.620	0.668	0.648	0.669	0.457	0.712
Father works related to govt.	0.491	0.500	0.521	0.474	0.502	0.463	0.488	0.278	0.841
Father member of CCP	0.432	0.496	0.409	0.372	0.471	0.373	0.469	3.253	0.021
Mother educ. above hs.	0.593	0.491	0.657	0.606	0.587	0.566	0.576	0.224	0.880

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	All		Exg users	C	CE	A	AE	ANOVA test	
	Mean	Std.Dev.	Mean	Mean	Mean	Mean	Mean	F-stat	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mother works related to govt.	0.477	0.500	0.524	0.481	0.494	0.471	0.447	0.566	0.638
Mother member of CCP	0.216	0.412	0.223	0.124	0.231	0.209	0.233	2.713	0.044
Total hh income in 2015	143807	185257	177903	139891	135338	137725	135566	0.029	0.993
z-score: household characteristics	-0.018	0.967	0.010	-0.067	0.068	-0.077	-0.035	1.106	0.346
Category 5: *Fundamental preferences*									
Willingness to take risk	5.614	1.957	5.847	5.818	5.537	5.475	5.553	0.951	0.415
Cert. equiv. of lottery choices	11.42	6.003	12.15	11.00	11.83	12.13	10.61	4.370	0.005
Prefer risky lottery options	3.595	1.272	3.620	3.526	3.537	3.717	3.573	1.111	0.343
z-score: risk preferences	-0.017	1.008	0.109	-0.011	-0.023	0.031	-0.101	1.025	0.381
Willingness to wait for future	6.020	2.176	6.244	5.978	6.019	5.898	5.982	0.138	0.938
Tendency not to procrastinate	5.106	2.909	5.041	5.102	5.019	5.107	5.184	0.185	0.907
z-score: time preferences	-0.003	0.995	0.057	-0.018	-0.025	-0.044	0.004	0.136	0.939
Willingness to give to good causes	6.921	2.251	6.690	6.927	7.077	6.930	6.843	0.616	0.604
Amount willing to donate	2627.8	2311.4	2582.4	2643.6	2888.0	2575.0	2534.5	1.362	0.253
z-score: altruism	-0.025	0.979	-0.043	-0.020	0.085	-0.037	-0.071	1.462	0.223
Willingness to return favor	8.871	1.281	8.719	8.927	8.985	8.889	8.863	0.530	0.661
Belief that others are well-intended	5.845	2.672	5.455	6.277	5.726	5.820	5.994	1.498	0.213
Willingness to give thank-you gift	5.390	1.238	5.430	5.730	5.390	5.299	5.320	4.377	0.005
Punish who treat self unfairly	5.453	2.477	5.488	5.547	5.598	5.348	5.383	0.640	0.589
Punish who treat others unfairly	4.542	2.330	4.463	4.460	4.552	4.705	4.518	0.448	0.718
Willingness to take revenge	3.513	2.370	3.591	3.679	3.286	3.574	3.518	1.043	0.373
z-score: reciprocity	0.014	1.007	-0.071	0.246	0.005	-0.007	0.006	2.302	0.076
# of obs.	1372		242	137	259	244	490	–	–

Notes: Sample contains students who have completed both baseline (November 2015) and endline (April 2017) surveys. Mean level of each characteristics are reported in column 1 for all participants (and column 2 for corresponding standard deviation), column 3 for students who use censorship circumvention tools prior to the baseline survey, column 4 for students in the control group *(C)*, column 5 for students in the control + encouragement group *(CE)*, column 6 for students in the access group *(A)*, and column 7 for students in the access + encouragement group *(AE)*. For each characteristic, an ANOVA test is conducted against the null hypothesis that students in the control, control + encouragement, access, and access + encouragement groups are not jointly different from each other in term of this characteristic. Column 8 and 9 report the corresponding F-statistics and p-value for each test, respectively.

Table A.4: Attrition in midline and endline surveys

	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Media-related behaviors, beliefs, and attitudes								
Category A.1: *Information source and media consumption*								
Ranked high: domestic websites	2.759	0.852	2.747	0.851	0.668	2.735	0.849	0.422
Ranked high: foreign websites	4.547	0.819	4.543	0.821	0.882	4.557	0.809	0.731
Ranked high: domestic social media	2.821	0.849	2.834	0.851	0.644	2.840	0.843	0.531
Ranked high: word of mouth	3.873	0.799	3.876	0.800	0.906	3.868	0.801	0.875
Freq. of visiting foreign websites for info.	3.009	1.654	3.020	1.655	0.862	3.048	1.650	0.337
Category A.3: *Valuation of access to foreign media outlets*								
Willingness to pay for circumvention tool	23.90	19.51	24.12	19.63	0.741	23.68	19.56	0.748
Value added of foreign media access	5.938	1.805	5.939	1.805	0.990	5.886	1.813	0.425
z-score: valuation of access to foreign media outlets	0.000	1.000	0.008	1.001	0.820	-0.027	1.008	0.460
Category A.4: *Trust in media outlets*								
Distrust of domestic state-owned media	4.830	2.374	4.846	2.363	0.845	4.798	2.368	0.706
Distrust in domestic privately-owned media	4.306	2.054	4.327	2.048	0.764	4.287	2.042	0.797
Trust in foreign media	6.124	1.836	6.127	1.860	0.957	6.119	1.838	0.938
z-score: trust in non-domestic media outlets	0.000	1.000	0.012	1.009	0.735	-0.014	0.995	0.690
Category A.5: *Belief regarding level of actual media censorship*								
Degree of censorship on domestic news outlets	7.474	1.727	7.479	1.733	0.933	7.440	1.738	0.581
Degree of censorship on foreign news outlets	5.898	1.974	5.881	1.974	0.795	5.934	1.956	0.607
Category A.6: *Justification of media censorship*								
Unjustified: censoring economic news	4.403	2.216	4.424	2.227	0.784	4.399	2.235	0.953
Unjustified: censoring political news	5.577	2.784	5.623	2.770	0.623	5.558	2.781	0.854
Unjustified: censoring social news	5.546	2.769	5.575	2.761	0.765	5.526	2.769	0.840
Unjustified: censoring foreign news	5.450	2.783	5.427	2.811	0.809	5.407	2.812	0.667
z-score: censorship unjustified	0.000	1.000	0.006	1.007	0.871	-0.014	1.005	0.705

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	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Category A.7: *Belief regarding drivers of media censorship*								
Domestic cens. driven by govt. policies	0.893	0.309	0.893	0.310	0.989	0.890	0.313	0.774
Domestic cens. driven by corp. interest	0.035	0.184	0.034	0.180	0.815	0.032	0.175	0.587
Domestic cens. driven by media's ideology	0.035	0.184	0.037	0.188	0.797	0.038	0.190	0.725
Domestic cens. driven by readers' demand	0.037	0.188	0.037	0.188	0.997	0.041	0.199	0.529
Foreign cens. driven by govt. policies	0.271	0.445	0.276	0.447	0.775	0.287	0.452	0.349
Foreign cens. driven by corp. interest	0.249	0.432	0.244	0.430	0.760	0.240	0.427	0.590
Foreign cens. driven by media's ideology	0.328	0.470	0.330	0.470	0.889	0.328	0.470	0.968
Foreign cens. driven by readers' demand	0.152	0.359	0.150	0.357	0.864	0.145	0.352	0.562
Panel B: Knowledge								
Category B.2: *Current news events not covered in the encouragement treatment*								
Shanghai's unprecedented stock market crash	0.660	0.474	0.656	0.475	0.773	0.659	0.474	0.938
Chinese invested railroad projects in Brazil and Peru	0.447	0.497	0.450	0.498	0.857	0.457	0.498	0.581
Presidential election in Taiwan	0.693	0.461	0.696	0.460	0.856	0.697	0.460	0.812
China and US's cooperation on Internet	0.366	0.482	0.370	0.483	0.834	0.374	0.484	0.662
% quizzes answered correctly: poli. sensitive news	0.619	0.357	0.622	0.356	0.794	0.623	0.356	0.781
RMB depreciation to simulate export	0.292	0.455	0.290	0.454	0.890	0.293	0.455	0.961
PLA troop cuts by 300,000	0.871	0.335	0.870	0.336	0.936	0.872	0.334	0.908
Li Ka-shing's investment in Mainland China	0.546	0.498	0.549	0.498	0.837	0.549	0.498	0.859
Nanking Massacre anniversary	0.775	0.418	0.770	0.421	0.737	0.778	0.416	0.844
% quizzes answered correctly: nonsensitive news	0.569	0.184	0.568	0.184	0.873	0.572	0.183	0.591
Category B.3: *Awareness of protests and independence movements*								
2012 HK Anti-National Curr. Movement	0.133	0.339	0.134	0.341	0.906	0.134	0.341	0.915
2014 HK Umbrella Revolution	0.184	0.388	0.182	0.386	0.889	0.176	0.381	0.531
2014 Taiwan Sunflower Stud. Movement	0.436	0.496	0.432	0.495	0.820	0.426	0.495	0.578
% protests in Greater China heard of	0.251	0.297	0.249	0.298	0.887	0.245	0.296	0.590
2014 Ukrainian Euromaidan Revolution	0.283	0.451	0.281	0.450	0.899	0.274	0.446	0.563
2010 Arab Spring	0.686	0.464	0.685	0.465	0.947	0.682	0.466	0.836
2014 Crimean Status Referendum	0.770	0.421	0.771	0.420	0.953	0.771	0.420	0.958
2010 Catalonian Indep. Movement	0.233	0.423	0.233	0.423	0.991	0.224	0.417	0.573

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	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
% foreign protests heard of	0.493	0.284	0.493	0.287	0.959	0.488	0.285	0.616
2011 Tomorrow Revolution [fake]	0.094	0.292	0.096	0.294	0.859	0.091	0.288	0.775
Category B.5: *Self-assessment of knowledge level*								
Informedness of issues in China	4.314	1.963	4.340	1.963	0.708	4.317	1.935	0.969
Greater informedness than peers	4.110	1.786	4.118	1.796	0.897	4.097	1.776	0.843
z-score: self-assessment of knowledge level	0.000	1.000	0.010	1.005	0.768	-0.003	0.989	0.926
Panel C: Economic beliefs								
Category C.1: *Belief on economic performance in China*								
Guess on GDP growth rate in 2016 China	7.019	3.004	7.045	3.091	0.809	7.028	3.071	0.938
Guess of SSCI by end of 2016	3255.1	623.3	3255.5	622.2	0.985	3267.2	611.9	0.586
z-score: optimistic belief of Chinese economy	0.000	1.000	0.006	1.009	0.853	0.016	1.015	0.665
Category C.2: *Confidence on guesses regarding economic performance in China*								
Confidence of China GDP guess	4.546	2.430	4.556	2.414	0.906	4.539	2.409	0.937
Confidence of SSCI guess	2.486	2.129	2.487	2.124	0.984	2.501	2.132	0.846
z-score: confidence of guesses on Chinese economy	0.000	1.000	0.003	0.992	0.938	0.002	0.995	0.948
Panel D: Political attitudes								
Category D.1: *Demand for institutional change*								
Economic system needs changes	5.236	1.973	5.215	1.966	0.754	5.154	2.003	0.246
Political system needs changes	5.411	2.172	5.388	2.174	0.759	5.317	2.178	0.230
z-score: demand for institutional change	0.000	1.000	-0.012	1.003	0.727	-0.048	1.017	0.185
Category D.2: *Trust in institutions*								
Trust in central govt. of China	6.918	2.114	6.885	2.132	0.654	6.960	2.112	0.576
Trust in provincial govt. of China	6.069	2.140	6.049	2.155	0.788	6.103	2.153	0.650
Trust in local govt. of China	5.079	2.239	5.074	2.236	0.948	5.128	2.247	0.536
z-score: trust in Chinese govt.	0.000	1.000	-0.010	1.006	0.774	0.024	1.000	0.498

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	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust in central govt. of Japan	3.926	2.406	3.925	2.417	0.988	3.919	2.403	0.932
Trust in federal govt. of US	4.958	2.232	4.967	2.242	0.910	4.961	2.224	0.966
z-score: trust in foreign govt.	0.000	1.000	0.002	1.005	0.958	-0.001	0.998	0.982
Category D.3: *Evaluation of government's performance*								
Satisfaction of economic dev.	5.975	1.788	5.967	1.783	0.897	6.005	1.790	0.639
Satisfaction of domestic politics	5.895	2.132	5.876	2.147	0.794	5.924	2.145	0.701
Satisfaction of diplomatic affairs	6.638	1.810	6.626	1.818	0.859	6.657	1.816	0.759
z-score: satisfaction of govt's performance	0.000	1.000	-0.008	1.004	0.826	0.016	1.004	0.649
Category D.6: *Evaluation of democracy and human rights protection in China*								
Living in democracy is not important	3.142	2.125	3.134	2.113	0.905	3.160	2.145	0.820
Category D.8: *Willingness to act*								
Willing to battle illegal govt. acts	6.027	2.518	6.072	2.499	0.594	6.040	2.517	0.881
Willing to report govt. misconduct	5.100	2.432	5.124	2.430	0.772	5.090	2.414	0.910
Willing to stand up for the weak	5.851	2.201	5.882	2.196	0.672	5.846	2.192	0.956
z-score: willingness to act	0.000	1.000	0.018	0.996	0.603	0.000	0.988	0.989
Panel E: Behaviors and planned behaviors								
Category E.1: *Social interaction in politics*								
Frequency of discussing poli. with friends	3.861	2.340	3.888	2.337	0.736	3.867	2.332	0.940
Frequency of persuading others	5.560	2.567	5.547	2.566	0.885	5.582	2.562	0.814
Category E.2: *Political participation*								
Protests concerning social issues	0.053	0.223	0.055	0.228	0.749	0.054	0.226	0.865
Plan to vote for local PCR	0.189	0.392	0.186	0.389	0.780	0.185	0.389	0.768
Complain to school authorities	0.198	0.399	0.201	0.401	0.834	0.204	0.403	0.678
Category E.3: *Investment in the Chinese stock market*								
Currently invested in Chinese stock mkt.	0.055	0.228	0.057	0.232	0.792	0.052	0.222	0.737

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	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Category E.4: *Plan after graduation*								
Plan: grad. school in China	0.491	0.500	0.485	0.500	0.713	0.504	0.500	0.473
Plan: master degree abroad	0.231	0.422	0.234	0.423	0.835	0.228	0.419	0.827
Plan: PhD degree abroad	0.114	0.318	0.115	0.319	0.968	0.107	0.309	0.504
Plan: military in China	0.005	0.067	0.004	0.062	0.739	0.005	0.072	0.789
Plan: work right away	0.102	0.302	0.103	0.305	0.884	0.100	0.300	0.868
Category E.5: *Career preferences*								
Sector pref.: national civil service	0.276	0.447	0.277	0.448	0.924	0.281	0.450	0.717
Sector pref.: local civil service	0.051	0.220	0.052	0.222	0.889	0.053	0.224	0.792
Sector pref.: military	0.065	0.247	0.067	0.249	0.862	0.064	0.245	0.924
Sector pref.: private firm in China	0.428	0.495	0.424	0.494	0.807	0.418	0.493	0.569
Sector pref.: foreign firm in China	0.692	0.462	0.692	0.462	0.987	0.683	0.465	0.577
Sector pref.: SOEs	0.441	0.497	0.438	0.496	0.878	0.445	0.497	0.844
Sector pref.: inst. organizations	0.559	0.497	0.563	0.496	0.817	0.559	0.497	0.982
Sector pref.: entrepreneurship	0.390	0.488	0.386	0.487	0.797	0.388	0.487	0.897
Location pref.: Beijing	0.324	0.468	0.315	0.464	0.571	0.322	0.468	0.939
Location pref.: Shanghai	0.131	0.337	0.135	0.342	0.728	0.133	0.339	0.882
Location pref.: Guangzhou and Shenzhen	0.055	0.229	0.054	0.227	0.896	0.049	0.216	0.435
Location pref.: tier 2 cities in central	0.039	0.194	0.039	0.194	0.977	0.044	0.205	0.497
Location pref.: other cities in China	0.273	0.446	0.273	0.446	0.967	0.276	0.447	0.830
Location pref.: HK and Macau	0.020	0.139	0.019	0.137	0.864	0.017	0.130	0.584
Location pref.: Taiwan	0.008	0.092	0.009	0.094	0.908	0.008	0.090	0.928
Location pref.: foreign cities	0.150	0.357	0.156	0.363	0.646	0.150	0.358	0.973
Panel F: Demographics, background characteristics, and fundamental preferences								
Category F.1: *Personal characteristics*								
Male	0.559	0.497	0.561	0.496	0.902	0.562	0.496	0.843
Birth year	1995.8	1.278	1995.8	1.262	0.667	1995.8	1.262	0.696
Height	170.1	9.311	170.0	9.407	0.867	169.9	8.951	0.576
Han ethnicity	0.912	0.283	0.910	0.287	0.814	0.914	0.280	0.844
Born in coastal province	0.417	0.493	0.412	0.492	0.777	0.415	0.493	0.918
Resided in coastal province	0.444	0.497	0.439	0.496	0.755	0.439	0.496	0.753

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	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Urban hukou prior to college	0.784	0.412	0.782	0.413	0.892	0.771	0.420	0.402
Religious	0.066	0.248	0.069	0.253	0.745	0.066	0.249	0.958
Member of CCP *[at baseline]*	0.068	0.252	0.066	0.248	0.769	0.064	0.245	0.660
z-score: personal characteristics	0.000	1.000	-0.002	1.010	0.958	-0.016	1.013	0.670
Category F.2: *Educational background*								
Elite university	0.825	0.380	0.835	0.371	0.396	0.823	0.382	0.902
Science track in high school	0.731	0.444	0.730	0.444	0.932	0.739	0.439	0.612
SoSc./Hum. major at college	0.450	0.498	0.449	0.498	0.931	0.426	0.495	0.176
z-score: educational background	0.000	1.000	0.005	0.994	0.875	-0.028	0.980	0.441
Category F.3: *English ability and oversea travel experiences [at baseline]*								
At least Level 4 certi. in English	0.514	0.500	0.511	0.500	0.876	0.509	0.500	0.764
Taken TOEFL or IELTS	0.131	0.337	0.130	0.336	0.949	0.122	0.327	0.456
z-score: English ability	0.000	1.000	-0.005	1.004	0.890	-0.023	0.986	0.512
Traveled to HK, Macau, Taiwan	0.185	0.389	0.182	0.386	0.856	0.176	0.381	0.506
Traveled to foreign countries	0.248	0.432	0.241	0.428	0.621	0.238	0.426	0.510
z-score: oversea travel experiences	0.000	1.000	-0.014	0.992	0.678	-0.029	0.988	0.416
Category F.4: *Household characteristics*								
Total # siblings	0.535	1.103	0.539	1.094	0.926	0.536	1.071	0.973
Father educ. above hs.	0.676	0.468	0.678	0.467	0.866	0.671	0.470	0.759
Father works related to govt.	0.493	0.500	0.486	0.500	0.707	0.491	0.500	0.911
Father member of CCP	0.428	0.495	0.427	0.495	0.979	0.432	0.496	0.803
Mother educ. above hs.	0.605	0.489	0.603	0.489	0.910	0.593	0.491	0.510
Mother works related to govt.	0.486	0.500	0.484	0.500	0.869	0.477	0.500	0.614
Mother member of CCP	0.225	0.418	0.220	0.414	0.689	0.216	0.411	0.523
Total hh income in 2015	147856	187049	145759	184540	0.742	143807	185257	0.544
z-score: household characteristics	0.000	1.000	-0.008	0.994	0.817	-0.018	0.967	0.604
Category F.5: *Fundamental preferences*								
Willingness to take risk	5.678	1.948	5.672	1.949	0.925	5.614	1.957	0.364
Cert. equiv. of lottery choices	11.43	5.963	11.33	5.928	0.616	11.42	6.003	0.951
Prefer risky lottery options	3.595	1.272	3.603	1.265	0.863	3.595	1.272	0.999

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	Completed baseline survey		Completed midline survey			Completed endline survey		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
z-score: risk preferences	0.000	1.000	-0.007	1.002	0.850	-0.017	1.008	0.639
Willingness to wait for future	6.028	2.162	6.053	2.160	0.737	6.020	2.176	0.918
Tendency not to procrastinate	5.107	2.895	5.119	2.918	0.904	5.106	2.909	0.987
z-score: time preferences	0.000	1.000	0.012	0.998	0.736	-0.003	0.995	0.930
Willingness to give to good causes	6.919	2.264	6.929	2.259	0.894	6.921	2.251	0.979
Amount willing to donate	2608.7	2329.8	2598.2	2311.8	0.895	2627.8	2311.4	0.819
z-score: altruism	0.000	1.000	0.000	0.998	0.999	0.006	0.995	0.874
Willingness to return favor	8.868	1.276	8.868	1.264	0.988	8.872	1.281	0.940
Belief that others are well-intended	5.822	2.650	5.819	2.667	0.969	5.845	2.672	0.808
Willingness to give thank-you gift	5.364	1.254	5.364	1.247	0.999	5.390	1.238	0.555
Punish who treat self unfairly	5.442	2.432	5.465	2.437	0.784	5.453	2.477	0.905
Punish who treat others unfairly	4.572	2.322	4.572	2.324	0.996	4.542	2.330	0.724
Willingness to take revenge	3.507	2.364	3.534	2.361	0.740	3.513	2.370	0.947
z-score: reciprocity	0.000	1.000	0.006	1.002	0.862	0.014	1.007	0.702
Group-C	0.102	0.303	0.105	0.307	0.792	0.100	0.300	0.815
Group-CE	0.182	0.386	0.188	0.391	0.625	0.189	0.391	0.601
Group-A	0.173	0.379	0.179	0.383	0.672	0.178	0.383	0.734
Group-AE	0.360	0.480	0.339	0.473	0.202	0.357	0.479	0.881
Existing users	0.183	0.387	0.189	0.392	0.649	0.176	0.381	0.622
# of obs.	1807		1617			1372		

Notes: Column 1-2 present summary statistics for each of the baseline survey questions among 1,807 study participants who have completed baseline survey (November 2015); column 3-4 present summary statistics among 1617 participants who have completed midline survey (May 2016); and column 6-7 present summary statistics among 1372 participants who have completed endline survey (April 2017). Column 5 present p-values of t-tests that compare corresponding mean between those who have completed baseline survey and those who have completed midline survey; column 8 present p-values of t-tests that compare corresponding mean between those who have completed baseline survey and those who have completed endline survey.

Table A.5: Predictors of endline attrition

Baseline survey category:	Attritted from endline survey				
	A	B	C	D	E
	(1)	(2)	(3)	(4)	(5)
Baseline survey categorical index	0.010	0.015	-0.021	0.050	0.050
	[0.036]	[0.032]	[0.039]	[0.035]	[0.038]
Group-CE	-0.043	-0.050	-0.046	-0.058	-0.056
	[0.043]	[0.040]	[0.040]	[0.041]	[0.041]
Group-A	-0.040	-0.043	-0.033	-0.048	-0.054
	[0.043]	[0.040]	[0.041]	[0.041]	[0.041]
Group-AE	-0.007	-0.017	-0.008	-0.016	-0.020
	[0.039]	[0.037]	[0.037]	[0.038]	[0.038]
Existing users	-0.049	0.006	-0.007	-0.020	0.002
	[0.051]	[0.043]	[0.042]	[0.045]	[0.043]
Baseline index × Group-CE	0.021	-0.011	0.007	-0.049	-0.065
	[0.045]	[0.039]	[0.046]	[0.042]	[0.045]
Baseline index × Group-A	0.015	-0.032	0.029	-0.052	-0.057
	[0.043]	[0.040]	[0.046]	[0.042]	[0.043]
Baseline index × Group-AE	0.029	-0.031	0.023	-0.016	-0.036
	[0.041]	[0.036]	[0.042]	[0.040]	[0.042]
Baseline index × Existing users	0.041	-0.011	0.060	-0.022	-0.064
	[0.048]	[0.041]	[0.045]	[0.044]	[0.045]

Note: Column 1-5 present regression coefficients, regressing indicator of attritted from endline survey (conditional on having completed the baseline survey), on an z-score index summarizing all outcomes elicited in the baseline survey belonging to a particular category, indicators of treatment status and being an existing user, and the interaction between the baseline outcome index and the indicators. Sample is restricted to 1,807 study participants who have completed baseline survey (November 2015), and the mean of endline attrition indicator is 0.759. The five categories of baseline outcomes are: *(A)* media-related behaviors, beliefs and attitudes; *(B)* knowledge; *(C)* economic beliefs; *(D)* political attitudes; and *(E)* behaviors and planned behaviors.

Table A.6: Predictors of access treatment take-up

	No controls		Control for *AE* indicator	
	Coefficient	Std.Error	Coefficient	Std.Error
Variables:	(1)	(2)	(3)	(4)
Category 1: *Personal characteristics*				
Male	-0.010	[0.031]	-0.002	[0.031]
Upper class cohorts	-0.053	[0.032]	-0.049	[0.032]
Height above median	-0.009	[0.031]	-0.006	[0.031]
Han ethnicity	0.075	[0.057]	0.075	[0.057]
Born in coastal provinces	-0.043	[0.031]	-0.037	[0.031]
Reside in coastal provinces	-0.042	[0.031]	-0.035	[0.031]
Urban hukou	0.061	[0.037]	0.050	[0.037]
Religious	-0.109	[0.063]	-0.100	[0.062]
Member of CCP	0.099	[0.055]	0.089	[0.056]
Category 2: *Educational background*				
Elite university	0.283	[0.039]	0.282	[0.038]
Science track in high school	-0.041	[0.034]	-0.039	[0.034]
Social sciences or humanities majors	0.013	[0.031]	0.013	[0.031]
Category 3: *English ability and oversea travel experiences [at baseline]*				
Passed at least English Level 4	0.034	[0.031]	0.035	[0.031]
Taken TOEFL or IELST	0.134	[0.042]	0.136	[0.042]
Been to Hong Kong or Taiwan	0.082	[0.039]	0.078	[0.039]
Been to other foreign countries	0.028	[0.036]	0.022	[0.036]
Category 4: *Household characteristics*				
Have siblings	-0.024	[0.033]	-0.023	[0.032]
Father above high school	0.060	[0.033]	0.060	[0.032]
Father works for govt.	0.011	[0.031]	0.010	[0.031]
Father is CCP member	0.029	[0.031]	0.020	[0.031]
Mother above high school	0.035	[0.031]	0.036	[0.031]
Mother works for govt.	0.026	[0.031]	0.029	[0.031]
Mother is CCP member	0.020	[0.036]	0.020	[0.036]
Household income above median	0.078	[0.033]	0.076	[0.032]
Category 5: *Fundamental preferences*				
Risk preference above median	-0.014	[0.031]	-0.007	[0.031]
Time preference above median	0.022	[0.031]	0.017	[0.031]
Altruism above median	-0.032	[0.031]	-0.031	[0.031]
Reciprocity above median	-0.031	[0.031]	-0.034	[0.031]
Category 6: *Knowledge & attitudes at baseline*				
Knowledge on censored news above median	0.057	[0.032]	0.057	[0.031]
Knowledge on uncensored news above median	0.033	[0.031]	0.031	[0.031]
Value uncensored media above median	-0.051	[0.031]	-0.051	[0.031]
Trust foreign media above median	0.011	[0.032]	0.020	[0.032]

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	No controls		Control for *AE* indicator	
	Coefficient	Std.Error	Coefficient	Std.Error
Variables:	(1)	(2)	(3)	(4)

Notes: access treatment take-up is defined as students' assigned censorship circumvention tool account has recorded at least one activity throughout the experiment. Columns 1 and 2 present regression coefficients and corresponding standard errors, regressing the take-up indicator on the listed baseline measures, one at a time. Columns 3 and 4 replicate Columns 1 and 2, but controlling for an indicator of whether the students belong to *AE* group. Sample is restricted to 963 students in the *A* and *AE* groups.

Table A.7: Predictors of active users of censorship circumvention tool

	No controls		Control for *AE* indicator	
	Coefficient	Std.Error	Coefficient	Std.Error
Variables:	(1)	(2)	(3)	(4)
Category 1: *Personal characteristics*				
Male	-0.016	[0.032]	-0.013	[0.032]
Upper class cohorts	-0.026	[0.033]	-0.024	[0.033]
Height above median	-0.016	[0.032]	-0.014	[0.032]
Han ethnicity	0.016	[0.057]	0.016	[0.057]
Born in coastal provinces	-0.045	[0.032]	-0.043	[0.032]
Reside in coastal provinces	-0.030	[0.032]	-0.027	[0.032]
Urban hukou	0.065	[0.038]	0.060	[0.038]
Religious	-0.062	[0.062]	-0.058	[0.062]
Member of CCP	0.077	[0.062]	0.073	[0.063]
Category 2: *Educational background*				
Elite university	0.271	[0.035]	0.271	[0.035]
Science track in high school	-0.026	[0.036]	-0.025	[0.036]
Social sciences or humanities majors	0.023	[0.033]	0.023	[0.032]
Category 3: *English ability and oversea travel experiences [at baseline]*				
Passed at least English Level 4	0.042	[0.032]	0.042	[0.032]
Taken TOEFL or IELST	0.058	[0.049]	0.059	[0.049]
Been to Hong Kong or Taiwan	0.103	[0.043]	0.101	[0.043]
Been to other foreign countries	0.075	[0.038]	0.073	[0.038]
Category 4: *Household characteristics*				
Father above high school	0.047	[0.034]	0.047	[0.034]
Father works for govt.	0.010	[0.032]	0.010	[0.032]
Father is CCP member	-0.007	[0.032]	-0.011	[0.032]
Mother above high school	0.051	[0.032]	0.052	[0.032]
Mother works for govt.	0.071	[0.032]	0.072	[0.032]
Mother is CCP member	0.040	[0.038]	0.040	[0.038]
Household income above median	0.076	[0.033]	0.076	[0.033]
Category 5: *Fundamental preferences*				
Risk preference above median	-0.010	[0.032]	-0.007	[0.032]
Time preference above median	0.081	[0.032]	0.079	[0.032]
Altruism above median	-0.020	[0.032]	-0.019	[0.032]
Reciprocity above median	0.003	[0.032]	0.002	[0.032]
Category 6: *Knowledge & attitudes at baseline*				
Knowledge on censored news above median	0.011	[0.033]	0.011	[0.033]
Knowledge on uncensored news above median	0.027	[0.032]	0.025	[0.032]
Value uncensored media above median	0.009	[0.032]	0.009	[0.032]
Trust foreign media above median	0.048	[0.033]	0.052	[0.033]

Notes: active users are students who have activated the censorship circumvention tool provided during the experiment and were actively using the tool (if the students' accounts record at least one browsing activity per day for more than 40 days after the encouragement treatment ends). Columns 1 and 2 present regression coefficients and corresponding standard errors, regressing the active user indicator on the listed baseline measures, one at a time. Columns 3 and 4 replicate Columns 1 and 2, but controlling for an indicator of whether the students belong to *AE* group. Sample is restricted to 963 students in the *A* and *AE* groups.

Table A.8: Browsing activities on foreign websites among endline survey participants

	Access		Access + Encour.		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value
	(1)	(2)	(3)	(4)	(5)
Panel A: *extensive margins (% of students), among all students*					
Activated accounts	57.8%	49.5%	72.9%	44.5%	<0.001
Active users	41.8%	49.4%	49.8%	50.1%	0.041
Panel B: *intensive margins (mins per day), among all students*					
Total daily browsing time	33.49	67.93	35.06	60.16	0.749
Google and related services	7.64	14.73	7.97	13.98	0.766
YouTube	3.87	9.31	4.98	12.20	0.211
Facebook	3.16	7.34	3.61	8.35	0.477
Twitter	2.79	7.29	2.96	7.70	0.742
Top foreign news websites	0.10	0.22	0.65	0.65	<0.001
New York Times	0.07	0.18	0.62	0.61	<0.001
Informational websites	3.20	6.12	3.50	5.68	0.508
Wikipedia	0.06	0.22	0.61	1.89	<0.001
Entertainment websites	10.04	16.05	9.54	14.12	0.666
Pornographic websites	2.83	8.91	3.01	9.79	0.807
Panel C: *intensive margins (mins per day), among active users*					
Total daily browsing time	79.85	85.87	70.04	69.52	0.266
Google and related services	18.20	18.13	15.67	16.55	0.208
YouTube	9.18	12.62	9.96	15.81	0.659
Facebook	7.49	9.85	7.21	10.68	0.821
Twitter	7.05	10.22	6.51	10.36	0.625
Top foreign news websites	0.24	0.29	1.20	0.43	<0.001
New York Times	0.17	0.25	1.14	0.37	<0.001
Informational websites	7.62	7.49	6.79	6.56	0.307
Wikipedia	0.15	0.32	1.22	2.53	<0.001
Entertainment websites	23.90	16.92	18.85	15.08	0.007
Pornographic websites	6.75	12.82	6.00	13.22	0.629

Note: Panel A shows the composition among students received only the access treatment (*Group-A*) and those who received both access and encouragement treatments (*Group-AE*). They are divided into 2 nested categories: *(i)* "activated accounts" — students who have activated the censorship circumvention tool provided during the experiment, as of April 10th, 2017 (the last day of the experiment); and *(ii)* "active users" — students who have activated the tool and were actively using the tool (if the student's account records at least one browsing activity per day for more than 40 days after the encouragement treatment ends). Panel B shows the average daily browsing time in total and on various categories of websites throughout the experiment after the encouragement treatment ends, among all students (assuming students without activated accounts spend 0 minute on these websites). Panel C replicates Panel B, but among students who actively used the tool. Top foreign news websites, informational, entertainment, and pornographic websites are defined primarily based on Alexa Top Websites categorization. Column 5 shows p-values of two-sided t-tests on the extensive margins and the intensive margins between the *Group-A* and *Group-AE* students. Sample is restricted to study participants who have completed the endline survey.

Table A.9: Effects of access & encouragement treatment - endline results

		Group-AE effect								Summary statistics			
		Cross-sectional difference			Control for imbalanced char.		Control for baseline level			C,CE,A,AE		C	Ext. users
		beta	s.e.	LSX adj. p-value	beta	s.e.	beta	s.e.	FDR adj. p-value	mean DV	std.dev. DV	mean DV	mean DV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Media-related behaviors, beliefs, and attitudes													
Category A.1: *Information source and media consumption*													
A.1.1	Ranked high: domestic websites	-0.342	[0.106]	-	-0.324	[0.107]	-0.336	[0.108]	-	3.719	1.113	3.869	3.223
A.1.2	Ranked high: foreign websites	0.588	[0.098]	-	0.549	[0.101]	0.554	[0.097]	-	2.251	1.164	1.949	2.707
A.1.3	Ranked high: domestic social media	-0.142	[0.086]	-	-0.169	[0.088]	-0.122	[0.087]	-	4.294	0.972	4.372	4.157
A.1.4	Ranked high: foreign social media	0.340	[0.085]	-	0.347	[0.088]	-	-	-	1.805	1.011	1.599	2.107
A.1.5	Ranked high: word of mouth	-0.459	[0.098]	-	-0.417	[0.099]	-0.473	[0.096]	-	2.925	1.124	3.212	2.802
A.1.6	Freq. of visiting foreign websites for info.	1.870	[0.141]	-	1.890	[0.142]	1.832	[0.134]	-	3.840	1.579	2.920	5.273
Category A.2: *Purchase of censorship circumvention tools*													
A.2.1	Purchase discounted tool we offered	0.225	[0.021]	-	0.221	[0.022]	-	-	-	0.115	0.319	0.007	0.076
A.2.2	Purchase any tool	0.489	[0.027]	-	0.486	[0.028]	-	-	-	0.289	0.454	0.029	0.983
Category A.3: *Valuation of access to foreign media outlets*													
A.3.1	Willingness to pay for circumvention tool	11.32	[1.451]	<0.001	12.24	[1.471]	11.20	[1.074]	0.001	22.80	17.62	16.91	36.15
A.3.2	Value added of foreign media access	0.847	[0.145]	<0.001	0.822	[0.147]	0.912	[0.129]	0.001	6.331	1.515	5.949	7.165
	z-score: valuation of access to foreign media outlets	0.726	[0.081]	-	0.745	[0.083]	0.754	[0.068]	-	-0.139	0.957	-0.492	0.648
Category A.4: *Trust in media outlets*													
A.4.1	Distrust of domestic state-owned media	0.987	[0.206]	<0.001	0.921	[0.209]	1.046	[0.164]	0.001	4.920	2.146	4.438	5.909
A.4.2	Distrust in domestic privately-owned media	0.985	[0.160]	<0.001	0.971	[0.163]	0.955	[0.146]	0.001	4.456	1.832	3.956	5.058
A.4.3	Trust in foreign media	1.344	[0.156]	<0.001	1.367	[0.158]	1.333	[0.144]	0.001	6.102	1.703	5.438	7.306
	z-score: trust in non-domestic media outlets	1.015	[0.080]	-	1.008	[0.082]	1.005	[0.074]	0.001	-0.149	0.960	-0.654	0.698
Category A.5: *Belief regarding level of actual media censorship*													
A.5.1	Degree of censorship on domestic news outlets	1.032	[0.145]	-	1.037	[0.149]	0.965	[0.126]	-	7.682	1.600	7.168	8.322
A.5.2	Degree of censorship on foreign news outlets	-1.414	[0.152]	-	-1.396	[0.154]	-1.360	[0.144]	-	6.118	1.818	6.832	4.917
Category A.6: *Justification of media censorship*													
A.6.1	Unjustified: censoring economic news	1.578	[0.175]	<0.001	1.600	[0.177]	1.633	[0.164]	0.001	4.415	2.053	3.679	5.636
A.6.2	Unjustified: censoring political news	1.435	[0.231]	<0.001	1.408	[0.236]	1.515	[0.234]	0.001	5.695	2.482	5.051	7.112

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		Group-AE effect								Summary statistics			
		Cross-sectional difference			Control for imbalanced char.		Control for baseline level			C,CE,A,AE		C	Ext. users
		beta	s.e.	LSX adj. p-value	beta	s.e.	beta	s.e.	FDR adj. p-value	mean DV	std.dev. DV	mean DV	mean DV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A.6.3	Unjustified: censoring social news	0.035	[0.260]	0.856	0.090	[0.266]	0.056	[0.262]	0.334	5.559	2.706	5.533	5.983
A.6.4	Unjustified: censoring foreign news	0.248	[0.274]	0.939	0.144	[0.284]	0.335	[0.261]	0.112	5.814	2.876	5.628	5.698
A.6.5	Unjustified: censoring pornography	0.843	[0.270]	<0.001	0.881	[0.272]	-	-	0.003	4.346	2.788	3.796	4.740
	z-score: censorship unjustified	0.540	[0.091]	-	0.532	[0.094]	0.591	[0.088]	-	-0.082	0.998	-0.340	0.381
Category A.7: *Belief regarding drivers of media censorship*													
A.7.1	Domestic cens. driven by govt. policies	0.130	[0.034]	-	0.122	[0.034]	0.131	[0.034]	-	0.881	0.323	0.825	0.983
A.7.2	Domestic cens. driven by corp. interest	-0.080	[0.027]	-	-0.083	[0.027]	-0.080	[0.027]	-	0.053	0.224	0.102	0.017
A.7.3	Domestic cens. driven by media's ideology	-0.021	[0.019]	-	-0.010	[0.018]	-0.023	[0.019]	-	0.052	0.223	0.044	0.000
A.7.4	Domestic cens. driven by readers' demand	-0.023	[0.015]	-	-0.023	[0.015]	-0.023	[0.015]	-	0.016	0.125	0.029	0.008
A.7.5	Foreign cens. driven by govt. policies	-0.096	[0.039]	-	-0.088	[0.040]	-0.113	[0.038]	-	0.166	0.373	0.226	0.062
A.7.6	Foreign cens. driven by corp. interest	0.007	[0.045]	-	-0.004	[0.046]	0.006	[0.045]	-	0.329	0.470	0.314	0.450
A.7.7	Foreign cens. driven by media's ideology	0.091	[0.047]	-	0.094	[0.048]	0.092	[0.047]	-	0.417	0.493	0.387	0.368
A.7.8	Foreign cens. driven by readers' demand	-0.002	[0.025]	-	-0.001	[0.026]	0.006	[0.026]	-	0.088	0.283	0.073	0.120
Panel B: Knowledge													
Category B.2: *Current news events not covered in the encouragement treatment*													
B.2.9	Steel production reduction reaches target	0.071	[0.041]	0.063	0.054	[0.042]	-	-	0.025	0.242	0.429	0.219	0.376
B.2.10	Trump registered trademarks in China	0.098	[0.045]	0.071	0.085	[0.046]	-	-	0.015	0.353	0.478	0.292	0.463
B.2.11	Jianhua Xiao kidnapped in Hong Kong	0.152	[0.045]	<0.001	0.142	[0.046]	-	-	0.004	0.740	0.439	0.650	0.802
B.2.12	Xinjiang installed GPS on all automobiles	0.183	[0.046]	<0.001	0.182	[0.047]	-	-	0.001	0.706	0.456	0.599	0.814
B.2.13	China and Norway re-normalizes ties	0.137	[0.046]	0.014	0.136	[0.047]	-	-	0.004	0.688	0.464	0.606	0.707
B.2.14	Feminist groups fight women's rights	0.124	[0.048]	0.023	0.125	[0.049]	-	-	0.007	0.506	0.500	0.445	0.587
B.2.15	Carrie Lam becomes HK Chief Executive	0.135	[0.045]	<0.001	0.139	[0.047]	-	-	0.004	0.354	0.478	0.299	0.463
	% quizzes answered correctly: poli. sensitive news	0.129	[0.019]	-	0.123	[0.019]	0.128	[0.019]	-	0.513	0.210	0.444	0.602
B.2.23	China stops importing coal from North Korea	-0.013	[0.048]	0.895	-0.029	[0.049]	-	-	1.000	0.511	0.500	0.547	0.550
B.2.24	H7N9 influenza epidemic	0.045	[0.044]	0.756	0.032	[0.045]	-	-	1.000	0.313	0.464	0.277	0.289
B.2.25	Transnational railway in Ethiopia	-0.010	[0.046]	0.997	-0.023	[0.047]	-	-	1.000	0.628	0.483	0.642	0.682
B.2.26	Foreign reserves fall below threshold	-0.026	[0.046]	0.939	-0.030	[0.046]	-	-	1.000	0.313	0.464	0.336	0.376
	% quizzes answered correctly: nonsensitive news	-0.001	[0.025]	-	-0.012	[0.025]	-0.001	[0.025]	-	0.441	0.257	0.451	0.474
Category B.3: *Awareness of protests and independence movements*													
B.3.1	2012 HK Anti-National Curr. Movement	0.141	[0.036]	<0.001	0.133	[0.036]	0.150	[0.034]	0.001	0.217	0.412	0.139	0.281
B.3.2	2014 HK Umbrella Revolution	0.156	[0.038]	<0.001	0.147	[0.039]	0.129	[0.033]	0.001	0.247	0.431	0.161	0.397
B.3.3	2016 HK Mong Kok Revolution	0.153	[0.038]	<0.001	0.146	[0.039]	-	-	0.001	0.250	0.433	0.168	0.413

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		Group-AE effect								Summary statistics			
		Cross-sectional difference			Control for imbalanced char.		Control for baseline level			C,CE,A,AE		C	Ext. users
		beta	s.e.	LSX adj. p-value	beta	s.e.	beta	s.e.	FDR adj. p-value	mean DV	std.dev. DV	mean DV	mean DV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
B.3.4	2014 Taiwan Sunflower Stud. Movement	0.089	[0.047]	0.028	0.080	[0.048]	0.085	[0.041]	0.010	0.657	0.475	0.613	0.702
	% protests in Greater China heard of	0.129	[0.027]	-	0.120	[0.027]	0.124	[0.023]	-	0.373	0.308	0.304	0.460
B.3.5	2014 Ukrainian Euromaidan Revolution	0.039	[0.046]	0.992	0.036	[0.047]	0.041	[0.044]	0.129	0.382	0.486	0.350	0.438
B.3.6	2010 Arab Spring	0.093	[0.043]	0.028	0.073	[0.042]	0.084	[0.037]	0.051	0.764	0.425	0.715	0.893
B.3.7	2014 Crimean Status Referendum	0.068	[0.039]	0.093	0.047	[0.039]	0.057	[0.029]	0.064	0.811	0.392	0.781	0.909
B.3.8	2010 Catalonian Indep. Movement	0.084	[0.041]	0.157	0.070	[0.042]	0.095	[0.025]	0.001	0.276	0.447	0.226	0.426
B.3.9	2017 Women's March around globe	0.093	[0.046]	0.156	0.080	[0.047]	-	-	0.074	0.385	0.487	0.336	0.521
	% foreign protests heard of	0.071	[0.027]	-	0.057	[0.027]	0.068	[0.020]	-	0.558	0.282	0.518	0.666
B.3.10	2011 Tomorrow Revolution [fake]	0.022	[0.027]	-	0.033	[0.027]	0.025	[0.027]	-	0.101	0.301	0.080	0.083
Category B.5: *Self-assessment of knowledge level*													
B.5.1	Informedness of issues in China	0.495	[0.189]	0.001	0.504	[0.191]	0.598	[0.150]	0.001	4.357	1.935	4.109	5.070
B.5.2	Greater informedness than peers	-0.584	[0.144]	<0.001	-0.603	[0.146]	-0.600	[0.148]	0.001	3.997	1.576	4.219	4.843
	z-score: self-assessment of knowledge level	-0.077	[0.088]	-	-0.082	[0.090]	-0.063	[0.081]	-	-0.105	0.985	-0.096	0.491
Panel C: Economic beliefs													
Category C.1: *Belief on economic performance in China*													
C.1.1	Guess on GDP growth rate in 2017 China	-0.896	[0.130]	<0.001	-0.903	[0.137]	-0.893	[0.127]	0.001	6.351	1.672	6.820	5.691
C.1.2	Guess of SSCI by end of 2017	-317.3	[40.90]	<0.001	-329.0	[40.45]	-308.1	[41.22]	0.001	3236.7	514.36	3363.5	2820.3
	z-score: optimistic belief of Chinese economy	-0.759	[0.076]	-	-0.781	[0.078]	-0.748	[0.075]	-	0.139	1.010	0.488	-0.648
Category C.2: *Confidence on guesses regarding economic performance in China*													
C.2.1	Confidence of China GDP guess	0.032	[0.236]	0.955	0.010	[0.239]	0.015	[0.209]	1.000	4.723	2.305	4.635	5.124
C.2.2	Confidence of SSCI guess	0.108	[0.202]	0.969	0.133	[0.207]	-0.004	[0.178]	1.000	2.280	2.029	2.153	2.620
	z-score: confidence of guesses on Chinese economy	0.039	[0.103]	-	0.040	[0.107]	-0.002	[0.088]	-	-0.035	1.008	-0.093	0.164
Category C.3: *Belief on economic performance in the US*													
C.3.1	Guess on GDP growth rate in 2017 US	1.197	[0.104]	<0.001	0.209	[0.107]	-	-	0.001	2.685	1.787	2.112	3.050
C.3.2	Guess on DJI by end of 2017	1794.9	[278.4]	<0.001	1612.4	[271.2]	-	-	0.001	19514.6	2926.2	18602.2	2158.4
	z-score: optimistic belief of US economy	0.894	[0.076]	-	0.856	[0.076]	-	-	-	-0.111	1.011	-0.552	0.520
Category C.4: *Confidence on guesses regarding economic performance in US*													
C.4.1	Confidence of US GDP guess	0.049	[0.193]	0.896	0.050	[0.197]	-	-	1.000	2.793	2.070	2.708	3.062

Continued on next page

		Group-AE effect								Summary statistics			
		Cross-sectional difference			Control for imbalanced char.		Control for baseline level			C,CE,A,AE		C	Ext. users
		beta	s.e.	LSX adj. p-value	beta	s.e.	beta	s.e.	FDR adj. p-value	mean DV	std.dev. DV	mean DV	mean DV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
C.4.2	Confidence of DJI guess	0.067	[0.167]	0.904	0.112	[0.169]	-	-	1.000	1.669	1.794	1.547	1.793
	z-score: confidence of guesses on US economy	0.034	[0.094]	-	0.048	[0.094]	-	-	-	-0.020	0.993	-0.080	0.091
Panel D: Political attitudes													
Category D.1: *Demand for institutional change*													
D.1.1	Economic system needs changes	0.861	[0.205]	<0.001	0.885	[0.211]	0.887	[0.194]	0.001	5.249	2.167	4.825	5.909
D.1.2	Political system needs changes	1.507	[0.186]	<0.001	1.515	[0.189]	1.591	[0.159]	0.001	4.773	2.223	3.920	6.364
	z-score: demand for institutional change	0.622	[0.089]	-	0.630	[0.091]	0.651	[0.081]	-	-0.104	1.000	-0.438	0.485
Category D.2: *Trust in institutions*													
D.2.1	Trust in central govt. of China	-1.576	[0.200]	<0.001	-1.482	[0.203]	-1.505	[0.198]	0.001	6.659	2.250	7.431	5.674
D.2.2	Trust in provincial govt. of China	-1.250	[0.184]	<0.001	-1.163	[0.189]	-1.215	[0.168]	0.001	5.588	2.047	6.219	4.702
D.2.3	Trust in local govt. of China	-1.104	[0.205]	<0.001	-1.054	[0.208]	-1.048	[0.200]	0.001	4.475	2.105	5.022	3.624
	z-score: trust in Chinese govt.	-0.700	[0.088]	-	-0.660	[0.089]	-0.662	[0.084]	-	0.086	0.980	0.432	-0.400
D.2.7	Trust in central govt. of Japan	0.947	[0.185]	<0.001	0.879	[0.190]	0.976	[0.172]	0.001	3.673	2.073	3.226	4.814
D.2.8	Trust in federal govt. of US	0.348	[0.194]	0.031	0.259	[0.198]	0.384	[0.190]	0.022	4.817	1.999	4.650	5.161
	z-score: trust in foreign govt.	0.349	[0.091]	-	0.306	[0.093]	0.368	[0.086]	-	-0.070	0.988	-0.236	0.329
Category D.3: *Evaluation of government's performance*													
D.3.1	Satisfaction of economic dev.	-1.254	[0.174]	<0.001	-1.174	[0.176]	-1.174	[0.152]	0.001	5.638	1.180	6.197	4.645
D.3.2	Satisfaction of domestic politics	-1.308	[0.199]	<0.001	-1.238	[0.204]	-1.227	[0.182]	0.001	5.551	2.137	6.102	4.459
D.3.3	Satisfaction of diplomatic affairs	-0.122	[0.187]	0.955	-0.066	[0.189]	-0.016	[0.177]	0.448	6.633	1.945	6.766	6.248
	z-score: satisfaction of govt's performance	-0.504	[0.094]	-	-0.462	[0.096]	-0.437	[0.083]	-	0.084	0.971	0.324	-0.394
Category D.6: *Evaluation of democracy and human rights protection in China*													
D.6.4	Living in democracy is not important	-0.859	[0.218]	-	-0.995	[0.220]	-0.945	[0.162]	-	3.453	2.132	3.898	2.715
Category D.8: *Willingness to act*													
D.8.1	Willing to battle illegal govt. acts	0.509	[0.233]	<0.001	0.499	[0.234]	0.495	[0.214]	0.022	6.080	2.422	5.854	6.657
D.8.2	Willing to report govt. misconduct	0.296	[0.223]	0.051	0.349	[0.228]	0.332	[0.199]	0.044	4.964	2.347	4.883	5.508
D.8.3	Willing to stand up for the weak	0.617	[0.203]	<0.001	0.685	[0.209]	0.627	[0.174]	0.001	6.182	2.062	5.869	6.727
	z-score: willingness to act	0.276	[0.095]	-	0.296	[0.097]	0.281	[0.078]	-	-0.054	0.999	-0.179	0.252

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		Group-AE effect								Summary statistics			
		Cross-sectional difference			Control for imbalanced char.		Control for baseline level			C,CE,A,AE		C	Ext. users
		beta	s.e.	LSX adj. p-value	beta	s.e.	beta	s.e.	FDR adj. p-value	mean DV	std.dev. DV	mean DV	mean DV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel E: Behaviors and planned behaviors													
Category E.1: *Social interaction in politics*													
E.1.1	Frequency of discussing poli. with friends	0.672	[0.219]	-	0.698	[0.224]	0.800	[0.177]	-	4.712	2.254	4.336	5.731
E.1.2	Frequency of persuading others	0.229	[0.229]	-	0.177	[0.233]	0.205	[0.196]	-	5.194	2.368	5.073	5.636
Category E.2: *Political participation*													
E.2.1	Protests concerning social issues	0.005	[0.020]	-	0.009	[0.021]	0.002	[0.020]	-	0.047	0.212	0.044	0.079
E.2.2	Plan to vote for local PCR	0.060	[0.048]	-	0.074	[0.048]	0.064	[0.047]	-	0.607	0.489	0.562	0.587
E.2.3	Complain to school authorities	0.068	[0.041]	-	0.065	[0.042]	0.062	[0.039]	-	0.261	0.439	0.226	0.322
Category E.3: *Investment in the Chinese stock market*													
E.3.1	Currently invested in Chinese stock mkt.	-0.045	[0.022]	-	-0.048	[0.023]	-0.039	[0.020]	-	0.050	0.217	0.066	0.116
Category E.4: *Plan after graduation*													
E.4.1	Plan: grad. school in China	-0.114	[0.048]	-	-0.075	[0.049]	-0.121	[0.046]	-	0.504	0.500	0.555	0.417
E.4.2	Plan: master degree abroad	0.135	[0.036]	-	0.099	[0.036]	0.116	[0.034]	-	0.211	0.408	0.139	0.269
E.4.3	Plan: PhD degree abroad	-0.004	[0.027]	-	-0.014	[0.028]	-0.003	[0.025]	-	0.084	0.278	0.088	0.165
E.4.4	Plan: military in China	-0.001	[0.008]	-	-0.000	[0.008]	-0.001	[0.009]	-	0.007	0.084	0.007	0.004
E.4.5	Plan: work right away	-0.031	[0.037]	-	-0.025	[0.037]	-0.023	[0.034]	-	0.150	0.358	0.182	0.107
Category E.5: *Career preferences*													
E.5.1	Sector pref.: national civil service	0.022	[0.022]	-	0.015	[0.023]	0.018	[0.022]	-	0.075	0.264	0.051	0.050
E.5.2	Sector pref.: local civil service	0.001	[0.008]	-	0.002	[0.009]	0.001	[0.008]	-	0.008	0.089	0.007	0.000
E.5.3	Sector pref.: military	0.004	[0.012]	-	0.005	[0.012]	0.004	[0.012]	-	0.019	0.135	0.015	0.017
E.5.4	Sector pref.: private firm in China	0.047	[0.026]	-	0.048	[0.027]	0.045	[0.026]	-	0.112	0.315	0.066	0.103
E.5.5	Sector pref.: foreign firm in China	-0.026	[0.045]	-	-0.038	[0.046]	-0.055	[0.041]	-	0.310	0.463	0.328	0.285
E.5.6	Sector pref.: SOEs	0.019	[0.023]	-	0.020	[0.024]	0.021	[0.024]	-	0.086	0.280	0.058	0.058
E.5.7	Sector pref.: inst. organizations	-0.085	[0.046]	-	-0.079	[0.047]	-0.067	[0.039]	-	0.288	0.453	0.372	0.343
E.5.8	Sector pref.: entrepreneurship	0.003	[0.025]	-	0.005	[0.026]	0.013	[0.025]	-	0.067	0.251	0.073	0.095
E.5.9	Location pref.: Beijing	-0.030	[0.045]	-	-0.041	[0.045]	-0.029	[0.043]	-	0.288	0.453	0.314	0.202
E.5.10	Location pref.: Shanghai	0.023	[0.031]	-	0.017	[0.032]	0.040	[0.029]	-	0.140	0.347	0.109	0.178
E.5.11	Location pref.: Guangzhou and Shenzhen	-0.012	[0.027]	-	-0.005	[0.028]	-0.028	[0.025]	-	0.077	0.267	0.088	0.058
E.5.12	Location pref.: tier 2 cities in central	-0.023	[0.023]	-	-0.020	[0.023]	-0.022	[0.022]	-	0.050	0.219	0.066	0.058
E.5.13	Location pref.: other cities in China	-0.079	[0.046]	-	-0.061	[0.047]	-0.059	[0.041]	-	0.312	0.463	0.365	0.248

Continued on next page

		Group-AE effect								Summary statistics			
		Cross-sectional difference			Control for imbalanced char.		Control for baseline level			C,CE,A,AE		C	Ext. users
		beta	s.e.	LSX adj. p-value	beta	s.e.	beta	s.e.	FDR adj. p-value	mean DV	std.dev. DV	mean DV	mean DV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
E.5.14	Location pref.: HK and Macau	0.006	[0.004]	-	0.005	[0.004]	0.006	[0.004]	-	0.005	0.073	0.000	0.017
E.5.15	Location pref.: Taiwan	0.004	[0.003]	-	0.003	[0.003]	0.003	[0.002]	-	0.004	0.066	0.000	0.000
E.5.16	Location pref.: foreign cities	0.111	[0.026]	-	0.102	[0.027]	0.099	[0.027]	-	0.123	0.329	0.058	0.240

Notes: Regression coefficient estimates of the Group-AE indicator (regression include Group-CE, Group-A, Group-AE indicators, where Group-C is the omitted group) are shown in column 1, robust standard errors shown in column 2, and multiple hypotheses testing adjusted p-values (corresponding to t-tests against the null hypothesis that the estimated Group-AE coefficients are zero) shown in column 3. Column 4 and 5 show the regression coefficient estimates and robust standard errors, controlling for demographic and background characteristics that are imbalanced across the treatment groups at the endline survey (coastal residency status, high school track, parents' memberships in the Communist Party, certainty equivalent of the lottery preferences, and the amount of reciprocal gifts students are willing to give. Column 6 and 7 show the regression coefficient estimates and robust standard errors, controlling for baseline wave level; FDR-adjusted p-values (corresponding to t-tests against the null hypothesis that the estimated Group-AE coefficients are zero) shown in column 8. For space constraint, we do not show coefficient estimates on Group-CE and Group-A indicators. The multiple hypothesis testing adjusted p-values (LSX-adjusted p-values) are computed following List, Shaikh, and Xu (2016), Remark 3.7, taking into account of multiple outcomes in each categories and multiple treatment groups. The z-score indices (weighting by the inverse covariance of the standardized variables) and the FDR-adjusted p-values are computed following Anderson (2008). The LSX-adjusted and FDR-adjusted p-values are calculated if there are more than one outcome in the corresponding category, and these outcomes are not generated from a single survey question. Coefficients are estimated using 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).

Table A.10: News consumption responding to news shocks

	Group-AE				Group-A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: *Browsing time on the New York Times*								
Share of pol. sensitive articles on NYTimes	21.652 [0.438]	20.202 [0.433]	19.833 [0.499]	18.326 [0.444]	1.263 [0.477]	0.949 [0.475]	1.001 [0.507]	0.674 [0.504]
Panel B: *Browsing time on foreign media other than the New York Times*								
Share of pol. sensitive articles on NYTimes	0.004 [0.249]	-0.047 [0.250]	-0.082 [0.267]	-0.135 [0.268]	-0.033 [0.553]	0.007 [0.560]	-0.083 [0.607]	-0.042 [0.613]
# of obs.	24574	24122	23670	23218	9290	9119	8948	8777
Excl. US Presidential Election week	No	Yes	No	Yes	No	Yes	No	Yes
Excl. week-long national holidays	No	No	Yes	Yes	No	No	Yes	Yes
Mean of EV	0.147	0.146	0.150	0.149	0.147	0.146	0.150	0.149
Std.Dev. of EV	0.053	0.053	0.052	0.052	0.053	0.053	0.052	0.052

Note: all regressions include user fixed effects. "Share of politically sensitive articles on the *New York Times*" indicates the total share of articles published on the *New York Times* Chinese edition each week that report politically sensitive events *not* covered by the Chinese domestic news outlets. Browsing time on the *New York Times* and on other top foreign news websites are calculated as weekly sums (unit: minutes). Top foreign news websites are based on the top 20 websites in the news category, ranked by Alexa. Browsing time sample excludes the 8 weeks *during* which the encouragement treatment is distributed. The two week-long national holidays during the time frame are 2016 National Day holiday week (October 1st to 7th, 2016) and 2017 Chinese New Year holiday week (January 27th to February 3rd, 2017).

Table A.11: Robustness of treatment effects on knowledge, attitudes, beliefs, and behaviors

	A: Media-related behaviors, beliefs and attitudes	**B.** Knowledge	**C.** Economic beliefs	**D.** Political attitudes	**E.** Behaviors & planned behaviors
	(1)	(2)	(3)	(4)	(5)
Panel A: *Baseline*					
Encouragement only *(CE)*	0.126	0.066	0.065	0.054	0.105
	[0.075]	[0.096]	[0.103]	[0.095]	[0.092]
Access only *(A)*	0.215	0.119	0.136	0.164	0.176
	[0.080]	[0.102]	[0.100]	[0.096]	[0.096]
Encouragement + Access *(AE)*	1.268	0.412	0.573	0.853	0.328
	[0.067]	[0.088]	[0.089]	[0.086]	[0.084]
Panel B: *Control for imbalanced characteristics*					
Encouragement + Access *(AE)*	1.273	0.361	0.591	0.841	0.285
	[0.069]	[0.088]	[0.091]	[0.089]	[0.086]
Panel C: *Control for levels at baseline survey*					
Encouragement + Access *(AE)*	1.259	0.405	0.537	0.853	0.302
	[0.060]	[0.077]	[0.083]	[0.075]	[0.076]
Panel D: *Drop extremely politically correct subjects*					
Encouragement + Access *(AE)*	1.265	0.419	0.589	0.772	0.305
	[0.072]	[0.091]	[0.095]	[0.085]	[0.090]
Mean (all non-existing users)	-0.186	-0.108	-0.125	-0.139	-0.090
Std. dev. (all non-existing users)	0.959	0.982	0.997	0.955	0.947
Mean (control group)	-0.811	-0.327	-0.418	-0.556	-0.294
Std. dev. (control group)	0.681	0.896	0.923	0.906	0.850
Mean (existing users)	0.867	0.503	0.584	0.647	0.419
Std. dev. (existing users)	0.681	0.931	0.783	0.952	1.129

Notes: Survey outcomes in each of the A-E categories are summarized by an z-score index, weighting by the inverse covariance of the standardized variables, following Anderson (2008). Panel A shows baseline regression coefficient estimates and robust standard errors of the Group-CE, Group-A, and Group-AE indicators, where Group-C is the omitted group. Panel B replicates baseline specification, adding controls for the baseline characteristics that are not experimentally balanced. Panel C replicates baseline specification, adding controls for the outcome levels measured at baseline survey. Panel D replicates baseline specification, dropping subjects who report answers that are extremely politically correct (in particular, answered 10 out of 10 on trust level of central government of China in endline survey). Coefficients are estimated using 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).

Table A.12: Quantile movement of treated students

		Percentile of median student in *Group-AE*					
		Excl. existing users			Among all students		
		Baseline	Endline	Change	Baseline	Endline	Change
		(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Media-related behaviors, beliefs, and attitudes							
A.1.2	Ranked high: foreign websites	50	59	9	50	58	8
A.1.6	Freq. of visiting foreign websites for info.	51	72	21	44	64	20
A.2.1	Purchase discounted tool we offered	-	55	7	-	55	8
A.2.2	Purchase any tool	-	73	32	-	61	28
A.3	Valuation of access to foreign media outlets	51	68	17	45	62	17
A.4	Trust in non-domestic media outlets	49	71	22	43	64	21
A.5.1	Degree of censorship on domestic news outlets	53	65	12	52	63	11
A.5.2	Degree of censorship on foreign news outlets	50	67	17	45	62	17
A.6	Censorship unjustified	51	61	10	48	57	9
A.7.1	Domestic cens. driven by govt. policies	49	55	6	51	52	1
A.7.2	Foreign cens. driven by govt. policies	50	49	-1	55	50	-5
Panel B: Knowledge							
B.2.a	% quizzes answered correctly: poli. sensitive news	54	60	6	50	56	6
B.2.b	% quizzes answered correctly: nonsensitive news	49	51	2	49	49	0
B.3.a	% protests in Greater China heard of	51	60	9	47	57	10
B.3.b	% foreign protests heard of	54	55	1	49	55	6
B.3.c	Heard of fake protest	54	52	-2	53	50	-3
B.5	Self-assessment of knowledge level	48	48	0	45	45	0
Panel C: Economic beliefs							
C.1	Optimistic belief of Chinese economy	52	71	19	45	61	16
C.2	Confidence of guesses on Chinese economy	49	50	1	49	49	0
C.3	Optimistic belief of US economy	-	70	38	-	64	36
C.4	Confidence of guesses on US economy	-	49	-2	-	49	-1
Panel D: Political attitudes							
D.1	Demand for institutional change	50	62	12	47	59	12
D.2.a	Trust in Chinese govt.	50	66	16	46	62	16
D.2.b	Trust in foreign govt.	50	59	9	47	56	9
D.3	Satisfaction of govt's performance	50	62	12	49	58	9
D.6	Living in democracy is not important	48	57	9	44	55	11
D.8	Willingness to act	50	55	5	47	54	7
Panel E: Behaviors and planned behaviors							
E.1.1	Frequency of discussing poli. with friends	46	56	10	42	53	11
E.1.2	Frequency of persuading others	51	52	1	49	51	2
E.2.1	Protests concerning social issues	49	48	-1	51	51	0
E.2.2	Plan to vote for local PCR	52	52	0	51	52	1

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		Percentile of median student in *Group-AE*					
		Excl. existing users			Among all students		
		Baseline	Endline	Change	Baseline	Endline	Change
		(1)	(2)	(3)	(4)	(5)	(6)
E.2.3	Complain to school authorities	51	54	3	52	53	1
E.3.1	Currently invested in Chinese stock mkt.	49	49	0	53	48	-5
E.4.2	Plan: master degree abroad	52	57	5	53	55	2
E.5.5	Sector pref.: foreign firm in China	51	51	0	49	51	2
E.5.16	Location pref.: foreign cities	51	53	2	50	52	2
	Overall z-score	51	62	11	47	56	9

Notes: Quantile movement is calculated as the change of the median *Group-AE* students' percentile of a corresponding variable in baseline survey across the distribution of all study participants who are not existing users of censorship circumvention tools at the tile of baseline survey (columns 1-3) or across the distribution of the entire study participants (column 4-6), compared to that in the endline survey. We randomly break the ties in the percentile rankings. For "degree of censorship on foreign news outlets", "optimistic belief of Chinese economy", "trust in Chinese govt.", "satisfaction of govt's performance", and "living in democracy is not important", we flip the original variable so that the treatment effect is positive. For outcomes in each category, we present quantile movement on the z-score index if available, or on one key outcome variable within the category if otherwise. "Overall z-score" is calculated using all the individual outcome variables listed in the table. The z-score indices (weighting by the inverse covariance of the standardized variables) and the FDR-adjusted p-values are computed following Anderson (2008). If the outcomes are not elicited in the baseline survey, we use the *Group-C* students answers at endline survey as a proxy benchmark to calculate the quantile movement. Sample is restricted to 1,372 completed endline surveys (April 2017).

Table A.13: Persuasion rates of exposure to uncensored Internet

		Persuasion rates
		(1)
Panel A: Media-related behaviors, beliefs, and attitudes		
A.1.2	Ranked high: foreign websites	27.3%
A.1.6	Freq. of visiting foreign websites for info.	129.9%
A.2.1	Purchase discounted tool we offered	35.1%
A.2.2	Purchase any tool	78.0%
A.3	Valuation of access to foreign media outlets	93.8%
A.4	Trust in non-domestic media outlets	121.9%
A.5.1	Degree of censorship on domestic news outlets	63.4%
A.5.2	Degree of censorship on foreign news outlets	88.3%
A.6	Censorship unjustified	59.8%
A.7.1	Domestic cens. driven by govt. policies	148.5%
A.7.2	Foreign cens. driven by govt. policies	41.7%
Panel B: Knowledge		
B.2.a	% quizzes answered correctly: poli. sensitive news	56.9%
B.2.b	% quizzes answered correctly: nonsensitive news	9.2%
B.3.a	% protests in Greater China heard of	55.0%
B.3.b	% foreign protests heard of	19.6%
B.3.c	Heard of fake protest	3.7%
B.5	Self-assessment of knowledge level	-3.7%
Panel C: Economic beliefs		
C.1	Optimistic belief of Chinese economy	138.1%
C.2	Confidence of guesses on Chinese economy	13.4%
C.3	Optimistic belief of US economy	113.5%
C.4	Confidence of guesses on US economy	-3.3%
Panel D: Political attitudes		
D.1	Demand for institutional change	74.8%
D.2.a	Trust in Chinese govt.	106.8%
D.2.b	Trust in foreign govt.	48.8%
D.3	Satisfaction of govt's performance	82.0%
D.6	Living in democracy is not important	26.9%
D.8	Willingness to act	38.5%
Panel E: Behaviors and planned behaviors		
E.1.1	Frequency of discussing poli. with friends	31.8%
E.1.2	Frequency of persuading others	20.8%
E.2.1	Protests concerning social issues	0.8%
E.2.2	Plan to vote for local PCR	11.5%
E.2.3	Complain to school authorities	13.0%
E.3.1	Currently invested in Chinese stock mkt.	259.9%
E.4.2	Plan: master degree abroad	27.0%
E.5.5	Sector pref.: foreign firm in China	27.6%

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		Persuasion rates
		(1)
E.5.16	Location pref.: foreign cities	20.1%

Notes: Persuasion rates are calculated as the *treatment-on-the-treated* effect of access plus encouragement treatments, divided by the share of *Group-AE* students who do not hold "uncensored beliefs" at the time of baseline survey. If the outcomes are not elicited in the baseline survey, we use the *Group-C* students answers at endline survey as a proxy. For questions that do not have a binary outcome, persuasion rates are calculated based on a transformed dependent variable, which equals one if the outcome is greater than or equal to the median answer, adjusted by direction when necessary. For outcomes in each category, we present persuasion rates on the z-score index if available, or on one key outcome variable within the category if otherwise. The z-score indices (weighting by the inverse covariance of the standardized variables) are computed following Anderson (2008). Sample is restricted to 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).

Table A.14: Heterogeneity of treatment effects

	A: Media-related behaviors, beliefs and attitudes	**B.** Knowledge	**C.** Economic beliefs	**D.** Political attitudes	**E.** Behaviors & planned behaviors
	(1)	(2)	(3)	(4)	(5)
Group-AE	1.346	0.228	0.235	0.762	0.065
	[0.213]	[0.259]	[0.275]	[0.241]	[0.257]
AE × (A) media-related above median	0.188	0.132	0.034	-0.009	0.059
	[0.093]	[0.113]	[0.120]	[0.105]	[0.112]
AE × (B) knowledge above median	-0.048	-0.194	-0.233	-0.141	0.086
	[0.093]	[0.113]	[0.120]	[0.105]	[0.113]
AE × (C) econ. beliefs above median	-0.064	-0.048	0.079	-0.082	-0.123
	[0.091]	[0.110]	[0.117]	[0.102]	[0.109]
AE × (D) pol. attitudes above median	-0.157	-0.064	-0.181	-0.044	-0.047
	[0.092]	[0.112]	[0.119]	[0.104]	[0.111]
AE × (E) behaviors above median	0.041	0.062	0.018	0.066	0.108
	[0.095]	[0.115]	[0.122]	[0.107]	[0.115]
AE × male	-0.032	-0.004	-0.143	0.141	-0.006
	[0.101]	[0.123]	[0.130]	[0.114]	[0.122]
AE × upper class	0.078	0.014	0.153	0.086	-0.054
	[0.110]	[0.134]	[0.142]	[0.125]	[0.133]
AE × coastal	-0.064	0.001	0.207	-0.030	-0.092
	[0.093]	[0.113]	[0.120]	[0.105]	[0.113]
AE × urban	0.214	-0.125	0.127	-0.009	0.047
	[0.139]	[0.169]	[0.179]	[0.157]	[0.168]
AE × elite univ.	-0.196	0.117	0.086	-0.135	0.063
	[0.118]	[0.144]	[0.153]	[0.134]	[0.143]
AE × science track	-0.018	0.213	0.283	0.052	0.083
	[0.130]	[0.157]	[0.167]	[0.146]	[0.156]
AE × SocS/Hum major	0.019	0.251	0.155	0.002	0.114
	[0.115]	[0.140]	[0.148]	[0.130]	[0.139]
AE × at least Eng Level 4	-0.019	-0.134	-0.029	0.173	-0.103
	[0.109]	[0.133]	[0.141]	[0.123]	[0.132]
AE × taken TOEFL/IELTS	0.077	0.080	0.053	-0.206	-0.190
	[0.151]	[0.183]	[0.194]	[0.170]	[0.182]
AE × been to HK/TW	-0.323	-0.137	0.135	0.043	-0.273
	[0.132]	[0.161]	[0.170]	[0.149]	[0.160]
AE × been abroad	-0.074	0.350	0.110	0.062	-0.001
	[0.121]	[0.147]	[0.156]	[0.136]	[0.146]
AE × father above hs	-0.182	0.252	0.134	-0.226	0.053
	[0.145]	[0.177]	[0.187]	[0.164]	[0.175]
AE × father works for govt.	-0.123	-0.151	0.081	-0.058	0.230
	[0.118]	[0.144]	[0.153]	[0.134]	[0.143]

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	A: Media-related behaviors, beliefs and attitudes	**B.** Knowledge	**C.** Economic beliefs	**D.** Political attitudes	**E.** Behaviors & planned behaviors
	(1)	(2)	(3)	(4)	(5)
AE × father is CCP member	-0.119	-0.010	-0.136	-0.203	-0.262
	[0.105]	[0.128]	[0.136]	[0.119]	[0.127]
AE × mother above hs	-0.003	-0.035	-0.035	0.171	0.067
	[0.142]	[0.172]	[0.183]	[0.160]	[0.171]
AE × mother works for govt.	0.155	0.145	0.014	0.206	-0.079
	[0.120]	[0.146]	[0.155]	[0.136]	[0.145]
AE × mother is CCP member	0.105	-0.339	-0.239	0.119	-0.138
	[0.118]	[0.143]	[0.152]	[0.133]	[0.142]
AE × hh income above median	0.012	-0.232	-0.325	0.063	0.090
	[0.108]	[0.131]	[0.139]	[0.122]	[0.130]
AE × risk pref. above median	-0.149	0.029	0.123	-0.150	-0.098
	[0.092]	[0.112]	[0.118]	[0.104]	[0.111]
AE × time pref. above median	-0.026	-0.132	-0.044	0.026	0.034
	[0.090]	[0.109]	[0.116]	[0.102]	[0.109]
AE × altruism above median	0.049	-0.080	-0.001	0.196	0.107
	[0.093]	[0.113]	[0.119]	[0.105]	[0.112]
AE × recipro. above median	0.226	0.190	0.005	-0.020	0.039
	[0.091]	[0.111]	[0.117]	[0.103]	[0.110]
Mean (all non-existing users)	-0.186	-0.108	-0.125	-0.139	-0.090
Std. dev. (all non-existing users)	0.959	0.982	0.997	0.955	0.947
Mean (control group)	-0.811	-0.327	-0.418	-0.556	-0.294
Std. dev. (control group)	0.681	0.896	0.923	0.906	0.850
Mean (existing users)	0.867	0.503	0.584	0.647	0.419
Std. dev. (existing users)	0.681	0.931	0.783	0.952	1.129

Notes: Regression coefficient estimates of the treatment effect of access and encouragement treatments combined *(AE)* on the z-score index that summarizes each of the 5 categories of outcomes of interests elicited at the endline survey, subsample indicators, and the corresponding interaction terms between *AE* treatment indicator and the subsample indicators. Students in the *C*, *CE*, and *A* groups are pooled in order to maximize power. Subsample indicators are constructed using all 5 outcome categories elicited in the baseline survey, and all demographic characteristics and fundamental preferences (described in Appendix D, Panel F), except for the dimensions with highly skew distribution. For example, we do not construct subsample indicator based on students' membership in the Chinese Communist Party, because only 6% of the study participants are party members. For space constraint, we do not show the coefficient estimates of the subsample indicators. The z-score indices (weighting by the inverse covariance of the standardized variables) and the FDR-adjusted p-values are computed following Anderson (2008). Coefficients are estimated using 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).

Table A.15: Estimation of social learning model - knowledge

Poli. sensitive news events:	Steel production reduction reaches target	Censorship of the Economist	Film on HK independence winning award	Trump registered trademarks in China	China and Norway re-normalize ties	Carrie Lam becomes HK Chief Executive	Feminist groups fight women's right	Jiahua Xiao kidnapped in HK	Xinjiang installed GPS on all automobiles	Cause of stock market crash in Jan. 2016	Foreign leaders involved in Panama Papers	*Overall percentage of quizzes correctly answered*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: *Reduced form analyses*												
Access & active	0.094	0.104	0.106	0.156	0.172	0.185	0.197	0.228	0.283	0.285	0.332	0.204
	[0.056]	[0.059]	[0.059]	[0.061]	[0.061]	[0.061]	[0.064]	[0.056]	[0.058]	[0.049]	[0.040]	[0.022]
Roommate w/ access	0.023	0.040	0.038	0.018	0.075	0.047	0.078	0.127	0.177	0.151	0.222	0.076
	[0.056]	[0.059]	[0.059]	[0.061]	[0.061]	[0.062]	[0.064]	[0.056]	[0.058]	[0.049]	[0.040]	[0.022]
Access & active × Roommate w/ access	-0.001	-0.017	-0.017	-0.047	-0.062	0.002	-0.047	-0.078	-0.121	-0.047	-0.114	-0.032
	[0.071]	[0.076]	[0.076]	[0.078]	[0.078]	[0.078]	[0.082]	[0.071]	[0.074]	[0.063]	[0.052]	[0.028]
Panel B: *Implied social transmission rates*												
Transmission rate (receiver w/ access)	0.086	0.072	0.067	0.044	0.107	0.113	0.139	0.162	0.237	0.187	0.249	0.118
	[0.206]	[0.107]	[0.105]	[0.151]	[0.087]	[0.150]	[0.117]	[0.071]	[0.079]	[0.061]	[0.045]	[0.034]
Transmission rate (receiver w/o access)	0.084	0.041	0.037	-0.071	0.019	0.117	0.055	0.062	0.075	0.128	0.121	0.069
	[0.168]	[0.087]	[0.085]	[0.114]	[0.068]	[0.124]	[0.093]	[0.057]	[0.063]	[0.052]	[0.038]	[0.027]
Panel C: *Predictions and out-of-sample tests*												
Actual: % correct (receiver w/o access)	0.188	0.514	0.548	0.367	0.703	0.328	0.531	0.797	0.766	0.808	0.918	0.614
Predicted: % correct (receiver w/o access)	0.225	0.528	0.534	0.285	0.681	0.317	0.506	0.798	0.787	0.799	0.955	0.589
	[0.067]	[0.086]	[0.087]	[0.078]	[0.080]	[0.070]	[0.076]	[0.069]	[0.068]	[0.071]	[0.057]	[0.027]
Actual: % correct (receiver w/ access)	0.314	0.594	0.604	0.441	0.755	0.490	0.637	0.912	0.882	0.981	1.000	0.743
Predicted: % correct (receiver w/ access)	0.317	0.599	0.607	0.347	0.735	0.505	0.614	0.883	0.856	1.000	1.000	0.733
	[0.071]	[0.080]	[0.079]	[0.084]	[0.073]	[0.079]	[0.084]	[0.057]	[0.059]	[0.049]	[0.017]	[0.024]

Notes: "Access & active" indicates whether students have access to uncensored Internet and actively browse its content; the indicator takes value 1 if the student is an existing user of the censorship circumvention tool prior to the baseline survey (November 2015), or is assigned with both the access and encouragement treatments (*Group-AE*). "Roommate w/ access" indicates whether there is one college dorm roommates who are actively use censorship circumvention tool as a result of the experimental treatment. "Overall percentage of quizzes correctly answered" aggregates all 11 news quizzes together, and use whether roommate receives access by the endline survey (April 2017) in the baseline specifications. Reduced form analyses and social transmission rates estimation are conducted among students who have completed the corresponding wave of the survey, have no roommates who were existing users of the censorship circumvention tool prior to the baseline survey, and have either 0 or 1 roommates who are actively use censorship circumvention tool as a result of the experimental treatment. Out-of-sample tests are conducted among students who have at least 2 roommates who are actively use censorship circumvention tool as a result of the experimental treatment; bootstrapped standard errors are shown in brackets. See Appendix H for more details.

Table A.16: Estimation of social learning model - all endline outcomes

	A: Media-related behaviors, beliefs and attitudes	**B.** Knowledge	**C.** Economic beliefs	**D.** Political attitudes	**E.** Behaviors & planned behaviors
	(1)	(2)	(3)	(4)	(5)
Access & active	1.451	0.822	0.781	0.851	0.296
	[0.101]	[0.124]	[0.128]	[0.114]	[0.122]
Roommate w/ access	0.273	0.405	-0.057	-0.074	0.073
	[0.101]	[0.124]	[0.129]	[0.114]	[0.122]
Access & active $\times$ Roommate w/ access	-0.261	-0.232	-0.212	0.124	0.054
	[0.129]	[0.158]	[0.163]	[0.145]	[0.156]
Mean (all non-existing users)	-0.186	-0.108	-0.125	-0.139	-0.090
Std. dev. (all non-existing users)	0.959	0.982	0.997	0.955	0.947
Mean (control group)	-0.811	-0.327	-0.418	-0.556	-0.294
Std. dev. (control group)	0.681	0.896	0.923	0.906	0.850
Mean (existing users)	0.867	0.503	0.584	0.647	0.419
Std. dev. (existing users)	0.681	0.931	0.783	0.952	1.129

Notes: Survey outcomes in each of the A-E categories are summarized by an z-score index, weighting by the inverse covariance of the standardized variables, following Anderson (2008). "Access & active" indicates whether students have access to uncensored Internet and actively browse its content; the indicator takes value 1 if the student is an existing user of the censorship circumvention tool prior to the baseline survey (November 2015), or is assigned with both the access and encouragement treatments (*Group-AE*). "Roommate w/ access" indicates whether there is one college dorm roommates who are actively use censorship circumvention tool as a result of the experimental treatment. Sample is restricted to students who have completed the corresponding wave of the survey, have no roommates who were existing users of the censorship circumvention tool prior to the baseline survey, and have either 0 or 1 roommates who are actively use censorship circumvention tool as a result of the experimental treatment.

Table A.17: Effects of access & encouragement treatment - midline results

		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Media-related behaviors, beliefs and attitudes								
Category A.1: *Information source and media consumption*								
A.1.1	Ranked high: domestic websites	-0.326	[0.086]	-	3.957	1.066	4.076	3.399
A.1.2	Ranked high: foreign websites	0.655	[0.076]	-	2.161	1.037	1.818	2.722
A.1.3	Ranked high: domestic social media	-0.113	[0.075]	-	4.211	0.940	4.294	4.088
A.1.4	Ranked high: foreign social media	0.327	[0.068]	-	1.603	0.900	1.465	2.023
A.1.5	Ranked high: word of mouth	-0.536	[0.087]	-	3.061	1.033	3.335	2.761
A.1.6	Frequency of visiting foreign websites for info.	1.886	[0.128]	-	3.738	1.614	2.835	5.248
Category A.3: *Valuation of access to foreign media outlets*								
A.3.1	Willingness to pay for circumvention tool	9.683	[1.350]	0.001	23.00	16.95	17.70	33.94
A.3.2	Value added of foreign media access	0.706	[0.148]	0.001	6.512	1.613	6.188	7.023
	z-score: valuation of access to foreign media outlets	0.640	[0.081]	-	-0.114	0.961	-0.438	0.489
Category A.4: *Trust in media outlets*								
A.4.1	Distrust in domestic state-owned media	0.856	[0.199]	0.001	5.149	2.233	4.706	5.935
A.4.2	Distrust in domestic privately-owned media	0.940	[0.152]	0.001	4.546	1.922	4.047	5.141
A.4.3	Trust in foreign media	0.714	[0.150]	0.001	6.234	1.739	5.935	6.882
	z-score: trust in non-domestic media outlets	0.729	[0.079]	-	-0.111	0.996	-0.461	0.477
Category A.5: *Belief regarding level of actual media censorship*								
A.5.1	Degree of censorship on domestic news outlets	0.786	[0.160]	-	7.558	1.804	7.159	8.307
A.5.2	Degree of censorship on foreign news outlets	-1.137	[0.162]	-	5.757	1.906	6.394	4.902
Category A.6: *Justification of media censorship*								
A.6.1	Unjustified: censoring economic news	1.718	[0.173]	0.001	4.640	2.178	3.747	5.487
A.6.2	Unjustified: censoring political news	1.490	[0.238]	0.001	5.848	2.748	5.176	7.042
A.6.3	Unjustified: censoring social news	0.149	[0.222]	0.336	5.637	2.653	5.641	6.281
A.6.4	Unjustified: censoring foreign news	-0.100	[0.225]	0.358	5.571	2.602	5.700	6.118

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A.6.5	Unjustified: censoring pornography	0.760	[0.254]	0.004	4.273	2.900	3.776	4.487
	z-score: censorship unjustified	0.437	[0.088]	-	-0.066	0.985	-0.289	0.285
Category A.7: *Belief regarding drivers of media censorship*								
A.7.1	Domestic cens. driven by govt. policies	0.140	[0.033]	-	0.859	0.348	0.794	0.974
A.7.2	Domestic cens. driven by corp. interest	-0.069	[0.025]	-	0.069	0.253	0.106	0.007
A.7.3	Domestic cens. driven by media's ideology	-0.045	[0.020]	-	0.050	0.217	0.065	0.016
A.7.4	Domestic cens. driven by readers' demand	-0.026	[0.015]	-	0.023	0.150	0.035	0.003
A.7.5	Foreign cens. driven by govt. policies	0.016	[0.031]	-	0.152	0.359	0.141	0.056
A.7.6	Foreign cens. driven by corp. interest	0.097	[0.041]	-	0.376	0.485	0.306	0.438
A.7.7	Foreign cens. driven by media's ideology	-0.077	[0.042]	-	0.337	0.473	0.394	0.366
A.7.8	Foreign cens. driven by readers' demand	-0.037	[0.031]	-	0.135	0.342	0.159	0.141
Category A.8: *Calibration of news outlets' level of censorship*								
A.8.1	Censorship: Chinese media on neg. news in China	0.251	[0.033]	0.001	0.257	0.437	0.124	0.294
A.8.2	Censorship: Chinese media on pos. news in China	-0.000	[0.000]	1.000	0.001	0.028	0.000	0.000
A.8.3	Censorship: Chinese media on neg. news in US	0.000	[0.000]	1.000	0.046	0.209	0.035	0.036
A.8.4	Censorship: Chinese media on pos. news in US	0.023	[0.017]	0.382	0.046	0.209	0.035	0.036
	z-score: censorship calibration of Chinese media	0.317	[0.050]	-	-0.004	1.017	-0.202	0.017
A.8.5	Censorship: US media on neg. news in China	0.002	[0.002]	0.393	0.002	0.048	0.000	0.010
A.8.6	Censorship: US media on pos. news in China	0.005	[0.010]	0.469	0.018	0.131	0.012	0.016
A.8.7	Censorship: US media on neg. news in US	0.014	[0.008]	0.393	0.018	0.134	0.006	0.010
A.8.8	Censorship: US media on pos. news in US	-0.000	[0.000]	0.393	0.002	0.039	0.000	0.000
	z-score: censorship calibration of US media	0.080	[0.049]	-	-0.002	0.984	-0.105	0.010
Category A.9: *Calibration of news outlets' bias*								
A.9.1	Bias: Chinese media on neg. news in China	0.500	[0.074]	0.001	1.509	0.950	1.235	1.621
A.9.2	Bias: Chinese media on pos. news in China	0.388	[0.059]	0.001	1.618	0.610	1.400	1.765
A.9.3	Bias: Chinese media on neg. news in US	0.376	[0.066]	0.001	1.233	0.796	1.029	1.343
A.9.4	Bias: Chinese media on pos. news in US	0.101	[0.063]	0.029	0.686	0.750	0.629	0.663
	z-score: bias calibration of Chinese media	0.666	[0.085]	-	-0.032	1.019	-0.401	0.139
A.9.5	Bias: US media on neg. news in China	-0.372	[0.070]	0.001	1.004	0.804	1.200	0.941

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A.9.6	Bias: US media on pos. news in China	0.053	[0.054]	0.544	0.831	0.658	0.788	0.824
A.9.7	Bias: US media on neg. news in US	0.019	[0.059]	0.885	0.754	0.698	0.729	0.716
A.9.8	Bias: US media on pos. news in US	-0.056	[0.060]	0.544	0.869	0.670	0.912	0.941
	z-score: bias calibration of US media	-0.162	[0.086]	-	0.002	1.009	0.078	-0.008
Panel B: Knowledge								
Category B.1: *Current news events covered in the encouragement treatment*								
B.1.1	New report on income inequality in China	0.257	[0.041]	0.001	0.721	0.449	0.576	0.804
B.1.2	Termination of Caixin PMI publication	0.208	[0.040]	0.001	0.748	0.435	0.635	0.768
B.1.3	Labor unrest in China during Jan. 2016	0.227	[0.042]	0.001	0.658	0.474	0.535	0.742
B.1.4	Widespread underground water pollution	0.100	[0.036]	0.002	0.832	0.374	0.765	0.843
	% quizzes answered correctly: news in encouragement treatment	0.198	[0.022]	-	0.740	0.252	0.628	0.789
Category B.2: *Current news events not covered in the encouragement treatment*								
B.2.5	Foreign leaders involved in Panama Papers	0.132	[0.029]	0.001	0.902	0.298	0.835	0.948
B.2.6	Film on HK independence winning award	0.177	[0.043]	0.001	0.514	0.500	0.424	0.641
B.2.7	Cause of stock market crash in Jan. 2016	0.137	[0.036]	0.001	0.815	0.388	0.741	0.886
B.2.8	Censorship of "Economist"	0.118	[0.044]	0.002	0.508	0.500	0.453	0.578
	% quizzes answered correctly: poli. sensitive news	0.141	[0.022]	-	0.685	0.234	0.613	0.763
B.2.20	Apple vs. FBI on San Bernardino shooting	0.015	[0.042]	0.941	0.662	0.473	0.659	0.699
B.2.21	Taiwanese presidential election in 2016	0.062	[0.044]	0.880	0.471	0.499	0.424	0.507
B.2.22	Cause of Beijing Yihe hotel attack incidence	0.036	[0.043]	0.880	0.426	0.495	0.406	0.386
	% quizzes answered correctly: nonsensitive news	0.037	[0.024]	-	0.520	0.286	0.496	0.531
Category B.3: *Awareness of protests and independence movements*								
B.3.1	2012 HK Anti-National Curr. Movement	0.115	[0.029]	0.001	0.153	0.360	0.100	0.255
B.3.2	2014 HK Umbrella Revolution	0.147	[0.033]	0.001	0.212	0.409	0.141	0.376
B.3.3	2016 HK Mong Kok Revolution	0.142	[0.034]	0.001	0.229	0.420	0.159	0.382
B.3.4	2014 Taiwan Sunflower Stud. Movement	0.078	[0.043]	0.019	0.596	0.491	0.559	0.719
	% protests in Greater China heard of	0.114	[0.025]	-	0.320	0.296	0.267	0.450
B.3.5	2014 Ukrainian Euromaidan Revolution	0.022	[0.042]	0.177	0.352	0.478	0.341	0.451
B.3.6	2010 Arab Spring	0.088	[0.039]	0.053	0.743	0.437	0.700	0.889

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
B.3.7	2014 Crimean Status Referendum	0.064	[0.036]	0.057	0.793	0.405	0.765	0.905
B.3.8	2010 Catalonian Indep. Movement	0.090	[0.038]	0.053	0.265	0.441	0.224	0.444
	% foreign protests heard of	0.066	[0.024]	-	0.538	0.282	0.507	0.672
B.3.9	2011 Tomorrow Revolution [fake]	-0.014	[0.028]	-	0.108	0.310	0.118	0.108
Category B.4: *Awareness of notable figures*								
B.4.1	Zhiqiang Pu	0.103	[0.038]	0.004	0.266	0.442	0.224	0.359
B.4.2	Zhiqiang Ren	0.106	[0.034]	0.003	0.843	0.364	0.794	0.869
B.4.3	Joshua Wong	0.131	[0.025]	0.001	0.130	0.337	0.065	0.366
	% recently featured censored figures heard of	0.149	[0.027]	-	0.555	0.307	0.509	0.614
B.4.4	Zehou Li	0.038	[0.044]	1.000	0.568	0.496	0.553	0.667
B.4.5	Guangcheng Cheng	0.047	[0.038]	1.000	0.265	0.441	0.241	0.337
B.4.6	Xiaolin Li	0.016	[0.039]	1.000	0.279	0.449	0.271	0.405
	% non-recent censored figures heard of	0.058	[0.023]	-	0.310	0.262	0.282	0.444
B.4.7	Yushi Mao	-0.036	[0.044]	1.000	0.499	0.500	0.518	0.487
B.4.8	Huang Hong	-0.017	[0.041]	1.000	0.309	0.462	0.324	0.330
B.4.9	Qiangdong Liu	0.012	[0.018]	1.000	0.959	0.199	0.953	0.967
	% uncensored figures heard of	-0.013	[0.024]	-	0.589	0.269	0.589	0.568
B.4.10	Lequn Jia [fake]	-0.014	[0.021]	-	0.052	0.222	0.065	0.042
Category B.5: *Self-assessment of knowledge level*								
B.5.1	Informedness of issues in China	0.459	[0.165]	0.004	4.331	1.968	4.118	4.908
B.5.2	Greater informedness than peers	-0.737	[0.159]	0.001	3.664	1.797	4.000	4.833
	z-score: self-assessment of knowledge level	-0.107	[0.085]	-	-0.109	0.959	-0.062	0.467
Panel C: Economic beliefs								
Category C.1: *Belief on economic performance in China*								
C.1.1	Guess on GDP growth rate in 2016 China	-1.319	[0.256]	0.001	6.973	2.520	7.648	5.905
C.1.2	Guess of SSCI by end of 2016	-369.0	[40.58]	0.001	3058.2	452.1	3248.5	2887.4
	z-score: optimistic belief of Chinese economy	-0.899	[0.094]	-	0.130	1.012	0.593	-0.557

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Category C.2: *Confidence on guesses regarding economic performance in China*								
C.2.1	Confidence of China GDP guess	0.118	[0.197]	0.380	4.529	2.184	4.382	4.863
C.2.2	Confidence of SSCI guess	0.252	[0.166]	0.352	2.124	1.929	1.918	2.389
	z-score: confidence of guesses on Chinese economy	0.106	[0.088]	-	-0.032	0.998	-0.132	0.136
Category C.3: *Belief on economic performance in the US*								
C.3.1	Guess on GDP growth rate in 2016 US	0.952	[0.109]	0.001	3.171	1.608	2.711	3.517
C.3.2	Guess on DJI by end of 2016	1247.1	[169.1]	0.001	17269.2	1958.2	16618.4	18026.3
	z-score: optimistic belief of US economy	0.848	[0.074]	-	-0.079	1.005	-0.505	0.337
Category C.4: *Confidence on guesses regarding economic performance in US*								
C.4.1	Confidence of US GDP guess	0.391	[0.176]	0.058	2.757	2.075	2.447	3.026
C.4.2	Confidence of DJI guess	0.072	[0.147]	0.454	1.558	1.683	1.488	1.817
	z-score: confidence of guesses on US economy	0.131	[0.088]	-	-0.030	1.002	-0.138	0.130
Panel D: Political attitudes								
Category D.1: *Demand for institutional change*								
D.1.1	Economic system needs changes	1.024	[0.175]	0.001	5.191	1.998	4.712	5.980
D.1.2	Political system needs changes	1.271	[0.186]	0.001	5.274	2.456	4.624	6.516
	z-score: demand for institutional change	0.590	[0.085]	-	-0.098	0.996	-0.388	0.421
Category D.2: *Trust in institutions*								
D.2.1	Trust in central govt. of China	-1.436	[0.177]	0.001	6.500	2.217	7.312	5.676
D.2.2	Trust in provincial govt. of China	-1.274	[0.180]	0.001	5.466	2.108	6.194	4.735
D.2.3	Trust in local govt. of China	-1.211	[0.181]	0.001	4.355	2.118	5.024	3.644
	z-score: trust in Chinese govt.	-0.669	[0.081]	-	0.074	0.990	0.447	-0.315
D.2.4	Trust in court	-0.004	[0.167]	1.000	6.723	1.918	6.694	6.503
D.2.5	Trust in police	-0.168	[0.172]	1.000	6.168	1.958	6.212	5.899
	z-score: trust in court and police	-0.047	[0.087]	-	0.026	0.985	0.029	-0.109
D.2.6	Trust in domestic financial inst.	-0.989	[0.165]	-	6.248	1.887	6.765	5.369

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
D.2.7	Trust in central govt. of Japan	1.021	[0.191]	0.001	3.761	2.205	3.218	4.742
D.2.8	Trust in federal govt. of US	0.847	[0.186]	0.001	4.847	2.100	4.441	5.680
	z-score: trust in foreign govt.	0.460	[0.087]	-	-0.085	0.984	-0.318	0.362
D.2.9	Trust in foreign financial inst.	0.239	[0.174]	-	5.379	1.857	5.188	5.435
D.2.10	Trust in NGOs	1.052	[0.170]	-	5.670	1.925	5.165	6.121
Category D.3: *Evaluation of government's performance*								
D.3.1	Satisfaction of economic dev.	-1.353	[0.156]	0.001	5.641	1.882	6.347	4.725
D.3.2	Satisfaction of domestic politics	-1.291	[0.183]	0.001	5.305	2.220	6.041	4.435
D.3.3	Satisfaction of diplomatic affairs	-0.134	[0.159]	0.153	6.297	1.854	6.435	6.042
	z-score: satisfaction of govt's performance	-0.504	[0.083]	-	0.073	0.990	0.362	-0.312
Category D.4: *Performance evaluation criteria*								
D.4.1	Importance: universal suffrage	0.006	[0.004]	-	0.091	0.043	0.086	0.094
D.4.2	Importance: civil and human rights	-0.005	[0.002]	-	0.138	0.022	0.140	0.141
D.4.3	Importance: economic dev.	0.002	[0.002]	-	0.135	0.025	0.134	0.132
D.4.4	Importance: income and wealth equality	-0.007	[0.003]	-	0.125	0.028	0.130	0.124
D.4.5	Importance: rule of law	0.000	[0.002]	-	0.143	0.022	0.144	0.145
D.4.6	Importance: freedom of speech	-0.001	[0.002]	-	0.124	0.024	0.125	0.130
D.4.7	Importance: intl. affairs	0.004	[0.003]	-	0.120	0.030	0.118	0.112
D.4.8	Importance: handle history fairly	0.001	[0.002]	-	0.124	0.026	0.123	0.123
Category D.5: *Evaluation of severity of socioeconomic issues*								
D.5.1	Severity: social security and welfare	1.064	[0.166]	0.001	6.850	1.900	6.288	7.572
D.5.2	Severity: employment	0.881	[0.165]	0.001	6.798	1.865	6.324	7.346
D.5.3	Severity: environmental pollution	0.793	[0.157]	0.001	7.925	1.669	7.559	8.562
D.5.4	Severity: wealth inequality	0.812	[0.147]	0.001	7.715	1.764	7.318	8.118
D.5.5	Severity: govt. corruption	1.134	[0.167]	0.001	6.695	1.995	6.335	7.634
D.5.6	Severity: minority discrimination	1.839	[0.192]	0.001	3.829	2.406	2.824	4.971
	z-score: severity of socioeconomic issues	0.833	[0.084]	-	-0.100	1.000	-0.537	0.427
Category D.6: *Evaluation of democracy and human rights protection in China*								

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
D.6.1	China cares interest for masses	-1.054	[0.182]	0.001	5.128	2.192	5.653	4.242
D.6.2	Level of democracy in China	-0.696	[0.157]	0.001	4.995	1.886	5.329	4.121
D.6.3	Level of human rights protection	-1.033	[0.177]	0.001	5.352	1.990	5.871	4.458
D.6.4	Living in democracy is not important	-0.672	[0.204]	0.001	3.018	2.086	3.329	2.471
	z-score: eval. of China's democracy and human rights	-0.591	[0.090]	-	0.106	0.982	0.391	-0.455
Category D.7: *Justification of controversial policies and issues*								
D.7.1	Justified: minority policies	-1.464	[0.194]	0.001	6.113	2.299	6.953	4.958
D.7.2	Justified: migration restrictions	-1.157	[0.180]	0.001	5.149	2.293	5.765	4.327
D.7.3	Justified: one-child policy	-1.210	[0.202]	0.001	5.257	2.380	5.976	4.438
D.7.4	Justified: policy towards HK	-1.016	[0.156]	0.001	6.545	1.950	7.129	5.804
D.7.5	Justified: policy towards Taiwan	-0.839	[0.158]	0.001	6.378	1.941	6.776	5.761
D.7.6	Justified: govt. use of violence	-1.240	[0.219]	0.001	4.031	2.662	4.647	3.085
D.7.7	Justified: refusal of DPRK refugees	-0.869	[0.192]	0.001	4.731	2.192	5.082	4.013
D.7.8	Justified: prod. cut to reduce pollution	0.119	[0.162]	0.162	7.375	1.766	7.282	7.225
D.7.9	Justified: college admission policies	0.240	[0.160]	0.053	6.939	1.832	6.853	6.977
D.7.10	Justified: privatization of SOEs	0.279	[0.209]	0.065	5.551	2.347	5.371	5.500
	z-score: justification of govt. policies	-0.532	[0.082]	-	0.098	0.992	0.351	-0.420
D.7.11	Justified: legal. of homosexual marriage	1.164	[0.263]	0.001	6.471	2.864	5.971	7.425
D.7.12	Justified: legal. of prostitution	1.409	[0.238]	0.001	3.348	2.847	2.629	4.722
D.7.13	Justified: abortion	1.354	[0.224]	0.001	5.263	2.628	4.524	6.291
D.7.14	Justified: extra-marital sex	-0.272	[0.256]	0.210	3.961	2.898	4.135	4.683
D.7.15	Justified: transgenetic food	0.295	[0.195]	0.109	6.101	2.163	5.882	6.235
D.7.16	Justified: soft drugs usage	0.039	[0.209]	0.398	2.317	2.282	2.365	2.650
	z-score: justification of liberal issues	-0.228	[0.079]	-	-0.069	0.999	-0.228	0.296
Category D.8: *Willingness to act*								
D.8.1	Willing to battle illegal govt. acts	0.518	[0.213]	0.016	6.094	2.389	5.818	6.830
D.8.2	Willing to report govt. misconduct	0.319	[0.213]	0.308	4.991	2.344	5.012	5.676
D.8.3	Willing to stand up for the weak	0.554	[0.192]	0.013	6.107	2.067	5.829	6.565
	z-score: willingness to act	0.257	[0.091]	-	-0.063	1.000	-0.169	0.269
Category D.9: *Interest in politics and economics*								

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
D.9.1	Interest in economics	0.965	[0.219]	0.001	5.762	2.394	5.218	6.353
D.9.2	Interest in politics	0.670	[0.219]	0.001	5.040	2.455	4.729	5.471
	z-score: interest in politics and economics	0.384	[0.091]	-	-0.045	1.002	-0.246	0.194
Category D.10: *National identity*								
D.10.1	Proud of being Chinese	-0.219	[0.155]	-	7.798	1.825	7.947	7.252
Category D.11: *Fear to criticize the government*								
D.11.1	Fear to criticize govt. in public	0.027	[0.195]	-	5.088	2.267	5.112	5.003
Panel E: Behaviors and planned behaviors								
Category E.1: *Social interaction in politics*								
E.1.1	Frequency of discussing poli. with friends	0.605	[0.210]	-	4.439	2.360	4.088	5.373
E.1.2	Frequency of persuading others	0.269	[0.218]	-	5.385	2.405	5.276	5.716
Category E.2: *Political participation*								
E.2.1	Protests concerning social issues	0.011	[0.024]	-	0.083	0.276	0.076	0.101
E.2.2	Plan to vote for local PCR	0.025	[0.026]	-	0.102	0.303	0.088	0.101
E.2.3	Complain to school authorities	0.022	[0.037]	-	0.238	0.426	0.229	0.258
E.2.4	Participate in NGO activities	0.045	[0.030]	-	0.895	0.307	0.853	0.882
Category E.3: *Investment in the Chinese stock market*								
E.3.1	Currently invested in Chinese stock mkt.	-0.062	[0.021]	-	0.052	0.222	0.076	0.121
Category E.4: *Plan after graduation*								
E.4.1	Plan: grad. school in China	-0.132	[0.044]	-	0.481	0.500	0.535	0.382
E.4.2	Plan: master degree abroad	0.186	[0.033]	-	0.236	0.425	0.135	0.350
E.4.3	Plan: PhD degree abroad	0.007	[0.025]	-	0.089	0.285	0.088	0.141
E.4.4	Plan: military in China	-0.002	[0.006]	-	0.005	0.068	0.006	0.003
E.4.5	Plan: work right away	-0.009	[0.029]	-	0.117	0.321	0.129	0.095

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		Group-AE effect			Groups-C,CE,A,AE		Group-C	Existing users
		beta	s.e.	FDR adj. p-value	mean ex.var.	std.dev. ex.var.	mean ex.var.	mean ex.var.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Category E.5: *Career preferences*								
E.5.1	Sector pref.: national civil service	0.008	[0.038]	-	0.275	0.447	0.247	0.232
E.5.2	Sector pref.: local civil service	-0.019	[0.020]	-	0.050	0.219	0.059	0.023
E.5.3	Sector pref.: military	0.016	[0.021]	-	0.077	0.267	0.059	0.065
E.5.4	Sector pref.: private firm in China	0.076	[0.044]	-	0.481	0.500	0.429	0.471
E.5.5	Sector pref.: foreign firm in China	0.020	[0.040]	-	0.706	0.456	0.706	0.817
E.5.6	Sector pref.: SOEs	-0.047	[0.043]	-	0.384	0.487	0.388	0.346
E.5.7	Sector pref.: inst. organizations	-0.065	[0.042]	-	0.584	0.493	0.653	0.542
E.5.8	Sector pref.: entrepreneurship	0.010	[0.043]	-	0.368	0.482	0.382	0.412
E.5.9	Location pref.: Beijing	0.004	[0.038]	-	0.275	0.447	0.253	0.261
E.5.10	Location pref.: Shanghai	-0.028	[0.031]	-	0.138	0.345	0.147	0.160
E.5.11	Location pref.: tier 2 cities in south	-0.042	[0.025]	-	0.067	0.250	0.100	0.065
E.5.12	Location pref.: tier 2 cities in central	0.008	[0.019]	-	0.051	0.220	0.047	0.036
E.5.13	Location pref.: other cities in China	-0.032	[0.041]	-	0.297	0.457	0.324	0.206
E.5.14	Location pref.: HK and Macau	0.013	[0.005]	-	0.011	0.106	0.000	0.026
E.5.15	Location pref.: Taiwan	-0.006	[0.009]	-	0.007	0.083	0.012	0.013
E.5.16	Location pref.: foreign cities	0.083	[0.030]	-	0.153	0.360	0.118	0.232

Notes: Regression coefficient estimates of the *Group-AE* indicator (regression include Group-CE, Group-A, Group-AE indicators, where Group-C is the omitted group) are shown in column 1, robust standard errors shown in column 2, and FDR-adjusted p-values (corresponding to t-tests against the null hypothesis that the estimated Group-AE coefficients are zero) shown in column 3. For space constraint, we do not show coefficient estimates on Group-CE and Group-A indicators. The z-score indices (weighting by the inverse covariance of the standardized variables) and the FDR-adjusted p-values are computed following Anderson (2008). Coefficients are estimated using 1,312 completed midline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).