Media Censorship in China: 1984 or Brave New World?

Yuyu Chen
David Y. Yang*

October 18, 2017

— JOB MARKET PAPER —
— CLICK HERE FOR LATEST VERSION —

Abstract

Media censorship is a hallmark of authoritarian regimes. We conduct a field experiment in China to examine whether providing access to an uncensored Internet leads citizens to acquire politically sensitive information, and whether they are affected by the information. We track subjects' media consumption, beliefs regarding the media, economic beliefs, political attitudes, and behaviors. We find 4 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, due to the low demand for, and moderate social transmission of, uncensored information, China's censorship apparatus may remain robust for a large number of citizens receiving unencouraged access to an uncensored Internet.

Keywords: censorship, information, media, belief
JEL classification: D80, D83, L86, P26

*Chen: Guanghua School of Management, Peking University. Email: chenyuyu@gsm.pku.edu.cn. Yang: Department of Economics, Stanford University. Email: dyang1@stanford.edu. Yang is deeply grateful to Ran Abramitzky, Matthew Gentzkow, and Muriel Niederle for their advice at all stages of this project, and to Doug Bernheim, Pascaline Dupas, and Al Roth for their unceasing guidance and support. Helpful and much appreciated comments and suggestions were provided by David Atkin, Mike Callen, Davide Cantoni, Kate Casey, Arun Chandrasekhar, Raj Chetty, Luke Coffman, Stefano DellaVigna, Dave Donaldson, Ruben Enikolopov, Ben Enke, Ben Golub, David Laibson, Nathan Nunn, Jen Pan, Maria Petrova, Molly Roberts, Gerard Roland, Mark Rosenzweig, Al Roth, Andrei Shleifer, Adam Szeidl, Noam Yuchtman, Sevgi Yuksel, and many seminar and conference participants. Keping Wang, Yifei Sun, Shuai Chen, Ji Xu, Xi Yao, Yu Li, Yingzhen Zhang, Ziteng Lei, Xincheng Qiu, Min Fang, Huitian Bai, and Miqi Xiong and a dedicated survey recruitment team provided outstanding assistance in implementing the field experiment. Financial support from the Stanford Center for International Development, the Stanford Center at Peking University, the Stanford Graduate Research Opportunity Fund, the Stanford Freeman Spogli Institute for International Studies, the Stanford Institute for Research in the Social Sciences, the Stanford Gerald J. Lieberman Fellowship, the Stanford Department of Economics, the Stanford Economic Research Laboratory, the National Natural Science Foundation of China, Al Roth and two donors from Beijing is greatly appreciated. The experiment is approved by Stanford IRB (Protocol ID 34318), and is registered at AEA RCT registry (ID 0001412).

> 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 removing 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. Policymakers in the West hypothesize that combating censorship boils down to ensuring that citizens have access to uncensored information.[2] However, access may not be sufficient for citizens to acquire politically sensitive information, because citizens may not demand the information for reasons such as a lack of interest in politics, fear of government reprisal, and unawareness or distrust of foreign news outlets. Moreover, acquiring sensitive information may not be sufficient to affect citizens, as the effect hinges on the degree to which citizens are willing or able to change their beliefs and attitudes in response to uncensored information.

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.[3] 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 on 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, free provision of tools to access uncensored Internet has little impact on students' acquisition of politically sensitive information. Nearly half of the students do not use the tools 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.

[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.

[2] 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."

[3] China is home to the world's most sophisticated Internet censorship apparatus. University students are the core participants of anti-authoritarian movements to challenge the incumbent regime, not only in China but around the globe. In addition, the Internet is Chinese university students' dominant source of media consumption, as TV is typically barred in university dorms. We discuss the external validity of our findings in Section 5.1.2.

Second, temporary and modest incentives to visit Western news outlets lead to large and persistent increases in students' acquisition of politically sensitive information. The increase in information consumption after the incentivized encouragement ends — spending on average 435% more time on foreign news websites — suggests that demand is *not* inherently low. 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 persistently increases students' trust of these outlets, and makes them to consider the access more valuable. By the end of the experiment, about 23% of the newly exposed students pay to continue their uncensored Internet access.[4] Hence, the temporary intervention, by raising demand, has resulted in a lasting increase in students' acquisition of uncensored information.

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 and notable figures censored on domestic media, as well as politically sensitive events in the 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 willing to take actions to incite changes, more likely to plan on leaving China through foreign graduate schools, 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 55th percentile by the end of the experiment. The effect is the largest among students who have limited access to alternative sources of uncensored information (e.g. those from disadvantaged background).

Fourth, students who acquire politically sensitive information transmit some of their knowledge to their peers, but the magnitude of such spillover is much smaller than necessary to inform the majority of the student population. Exploiting variations in treatment saturation across university 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.[5] 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. These students with existing access are highly clustered (potentially due to social complementarity in usage), which dampens the scale of social transmission of politically sensitive knowledge.

Taken together, our findings suggest that censorship in China is effective *not* because the regime makes it impossible to access sensitive information (as in George Orwell's *1984*). Rather, it fosters an environment in which citizens do not demand such information in the first place (as in Aldous Huxley's *Brave New World*). 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 porous censorship apparatus is robust with respect to the

[4]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.

[5]The social transmission rate of knowledge is higher if the particular news event attracts more attention (e.g. it is more likely to be learned if a student regularly browses foreign news websites). We note, however, that our data only allows us to observe transmission among roommates, and hence can underestimate the overall social transmission of knowledge.

existing share of students accessing uncensored Internet prior to our experiment; and *(ii)* it 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, the censorship apparatus would remain robust: students are likely to continue underestimating the value of accessing uncensored Internet unless they begin to acquire politically sensitive information.

Our model simulation also demonstrates an optimistic scenario that *Brave New World* fails to capture: the censorship apparatus can also be fragile, precisely because its effectiveness depends on citizens' suppressed demand for uncensored information. Exposure to foreign media can change citizens' beliefs regarding its value, and hence persistently raise their demand for uncensored information. If we were to provide encouragement 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 political economy of mass media literature. The overall impact of media censorship identified in this study increases our broad understanding of how mass media influences citizens' political preferences and shapes aggregate outcomes.[6] Our study adds an important data point by: *(i)* investigating the case of China, the largest country engaging in state-led information control; and *(ii)* providing the first causal evidence via a field experiment to identify the impact of media censorship on shaping citizens' knowledge, economic beliefs, political attitudes, and behaviors.

In particular, this paper relates to the small strand of the literature on mass media that emphasizes the importance of demand-side factors. Theoretically, Mullainathan and Shleifer (2005) demonstrate that reader biases can generate media slant, despite market competition.[7] Empirically, Gentzkow and Shapiro (2010) show that newspaper slant in the United States can be largely accounted for by firms catering to consumer preferences.[8] Most relevant to our project, Hobbs and Roberts (2016) document that the demand for censorship circumvention tools was spurred by the sudden censorship of Instagram in September 2014, and that people subsequently used the tool to browse blocked websites, such as Twitter, for the first time. Roberts (2016) shows that the Chinese government deploys frictions (e.g. making connections slow) to restrict the flow of sensitive information on the Internet — an indicator that censorship apparatus leverages citizens' low demand for information to achieve the goal of information control.[9] Our paper uses a simple economic framework to demonstrate that the demand-side factors, when applying to the context of media censorship, help us better understand how and why the porous censorship in authoritarian regimes works.

[6]For example, DellaVigna and Kaplan (2007) on the US; Yanagizawa-Drott (2014) on Rwanda Genocide; Adena et al. (2015) on Nazi Germany; and Enikolopov, Petrova, and Zhuravskaya (2011), Enikolopov, Petrova, and Sonin (2016), and Enikolopov, Makarin, and Petrova (2016) on contemporary Russia. DellaVigna and Gentzkow (2010) review the empirical literature on persuasion across broader domains, and Prat and Strömberg (2013) provide a more recent survey of this literature, particularly in the domain of politics.

[7]Relatedly, Gentzkow and Shapiro (2006) show that when reports lay closer to Bayesian consumers' prior beliefs, they infer that news outlets are more trustworthy; thus, the media outlet becomes more likely to slant towards readers' prior expectations if the readers receive little amount of feedback regarding the truth.

[8]In addition, Gerber, Karlan, and Bergan (2009) find that randomly distributing partisan newspapers to US citizens fails to lead to changes in their knowledge, political opinions, and behaviors related to voting. This suggests the importance of taking citizens' demand for information into account, since random subscription does not necessarily lead to new information exposure. Abramitzky and Sin (2011) document that the inflow of Western knowledge into Eastern Europe after the collapse of Communism is much more pronounced in satellite and Baltic countries than in Soviet ones, suggesting the crucial role played by underlying demand differences.

[9]Several theoretical works model censorship as the government obstructing the access to valuable information that can affect citizens' beliefs and behaviors. For example, Diamond (2010), Geddes and Zaller (1989), Guriev and Treisman (2015), Schedler (2009), and Shadmehr and Bernhardt (2015). Gehlbach and Sonin (2014) build on the framework and endogenize citizens' media consumption.

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.[10] We show that censorship can effectively manipulate 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.[11]

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.[12] 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 censorship in China today.

2.1 The Great Firewall

The administrative regulations and legal framework in China ensure that media outlets based domestically would incur severe business and political costs from publishing content that the state deems threatening and objectionable.[13] As a result, domestic media outlet content 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 (King, Pan, and Roberts, 2013, 2014). 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

[10] Among others, state indoctrination (Voigtlander and Voth, 2015; Cantoni et al., 2017) and historical experiences (Alesina and Fuchs-Schündeln, 2007; Giuliano and Spilimbergo, 2014; Fuchs-Schündeln and Schündeln, 2015; Chen and Yang, 2015) have been identified as generating lasting impacts on citizens' political attitudes.

[11] Some recent studies investigate how people update beliefs based on censored (or truncated) 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, Chiang and Knight (2011) document that voters in the US discount information from biased news outlets; 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.

[12] The Freedom House's *Freedom of the Net Report* in 2016 labels China's "Net Freedom Status" as *not free*, and rates its "Internet Freedom Score" as 88 (out of 100, where 100 indicates the most unfree) — the "world's worst abuser of Internet freedom." Source: `https://freedomhouse.org/report/freedom-net/2016/china`, last accessed on October 17, 2017.

[13] We briefly outline the administrative and legal framework of Internet censorship in China in Appendix A.

specific foreign websites (or content hosted on those 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.

The Great Firewall deploys several technologies to block entire websites or specific webpages from being accessed by IP addresses located in China.[14] 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.[15] 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*.[16]

The sharpest difference between foreign news outlets and their domestic counterparts lies in the space of investigative journalism (Qin, Strömberg, and Wu, 2016). Uncensored investigative journalism may substantially shape readers' knowledge, beliefs, and attitudes. Our project focuses on such foreign news websites that directly host information, rather than foreign social media websites that can also be students' sources of information.

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 technological loophole has led to a range of censorship circumvention tools and services to aid Internet users in China in gaining access to websites that are otherwise blocked by the Great Firewall.

There were more than a dozen tools for bypassing censorship available to Chinese Internet users at the time when we started this experiment. Their prices ranged from free of charge to US$ 25 per month, as of November 2015.[17] Generally, the more expensive a tool is, the faster and more stable its connection, especially during periods such as the annual March meeting of the People's Congress, when the Chinese government *temporarily* shuts off some VPN services' connection. This indicates that while the government is technologically capable of thoroughly disrupting the operation of censorship circumvention tools, it chooses not to do so during majority of the days in the year.

Approximately 1-8% of Internet users in China regularly purchase tools to bypass censorship.[18] As a result, all 10 of the top 10 most trafficked websites in China, as of 2017, are domestic, a much higher ratio

[14] Some common technical methods used by the Great Firewall are: IP blocking, DNS filtering and redirection, URL filtering, packet filtering, man-in-the-middle attack, TCP connection reset, and VPN blocking.

[15] Estimates are provided by `greatfire.org`, an organization that monitors the activities of the Great Firewall.

[16] 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. The British newspaper, *The Economist*, is one of the newest additions to the list, first blocked in April 2016 during our study.

[17] "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*.

[18] Source: US Congressional Research Report "China, Internet Freedom, and U.S. Policy" published in 2012, `https://fas.org/sgp/crs/row/R42601.pdf`, last accessed on June 22, 2017. The total number of Internet users in China was estimated to be more than 721 million in 2016. Source: *Internet Live Stats*, which compiles data from the *International Telecommunication Union*, *World Bank*, and the *United Nations Population Division*, `www.InternetLiveStats.com`, last accessed on December 11, 2016.

compared to that in Hong Kong (4 out of 10), Taiwan (5 out of 10), and South Korea (3 out of 10).[19] 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.

Legality of bypassing Internet censorship 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.[20] In fact, officials at the Propaganda Department and the Ministry of Public Security rarely recognize the existence of the *Golden Shield Project* and the Great Firewall, making public and legal discussion of Great Firewall bypass tools impractical. As a result, many businesses (especially foreign ones) operating in China navigate such a legally grey zone that they rely on VPN tools to ensure the security, confidentiality, and reliability of their data transmission. 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.

Importantly, existing evidence shows that Chinese Internet users, especially college students, exhibit little fear about using tools to bypass censorship (Roberts, 2016). 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, 2016).

3 Experimental design

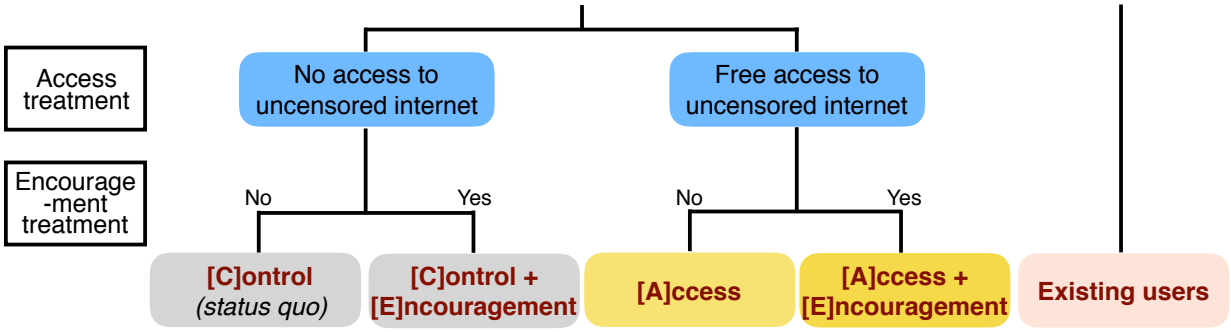
In Section 3.1, we describe our experimental treatments — providing free access to uncensored Internet and encouraging visits to foreign news outlets. In Section 3.2, we describe the outcomes of interest, examining how these treatments affect students' acquisition of uncensored contents. In order to study how the acquired uncensored content affects students, we use the differences in acquisition induced by the experimental treatments as the first stage variation, and we map it to a broad range of outcomes, such as knowledge, economic beliefs, political attitudes, and intended behaviors, all described in Section 3.3. Finally, in Section 3.4, we describe the logistics of the field experiment, discussing the timeline, recruitment, treatment assignment, panel survey, and sample retention.

3.1 Access and encouragement treatments

The experimental design can be summarized in the following figure. In the baseline survey (prior to treatment assignment), we identify students who have already purchased and are currently using tools to bypass censorship — the *existing users*. We exclude them 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.

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

[20] There has been no case of charges brought against Chinese Internet users for browsing websites blocked by the Great Firewall. However, actively spreading content blocked by the Great Firewall to a large group of people is directly subject to the government's cybersecurity regulations. There have been judicial actions against those cases, typically under the charges of "inciting social unrest and social turbulence" or "disrupting social order."



To address concerns that the encouragement treatment alone generates experimenter's 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. For most of our analyses, we pool control group students who are and are not encouraged to visit foreign news websites together for simplicity, since they do not differ in almost all dimensions. We examine whether the encouragement affects control group students in the Appendix.

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, and enables 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 (e.g. slow connection speed) that may prevent students from using the tool are kept to a minimum. An individual account would cost US$ 25 per month if students were to purchase it directly, and almost no students purchased this particular tool prior to our experiment — existing users chose cheaper substitutes. 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.[21]

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."[22] Students in the treatment group are given

[21] We provide a full list of the tool's features in Appendix B.1.

[22] Students can learn more about the censorship circumvention tool itself and track their usage status on the service website. We

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 can 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 to Youku (US$ 30), a video streaming service in China that is similar to Netflix. This serves as a placebo and makes it less obvious to participants that the study is explicitly focused on censorship circumvention tools.

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 these newsletters are an integral part of the study, and we curate their content 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 due to the knowledge that foreign news outlets exist, or students need to actually receive information from these outlets.[23] 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 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 represents one of the highest quality foreign news websites in Chinese language that are blocked by the Great Firewall. The *New York Times* Chinese edition provides political sensitive content unavailable on the domestic media, and it does not impose a paywall. We design the quizzes such that if (and only if) students visit the front page of the *New York Times* Chinese edition, can they locate the answer within a couple of minutes.[24] We implement 4 rounds of such quizzes, and students earn US$ 2.5 if they answer correctly in each round.

The encouragement materials cover many news stories. 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 example, we measure students' knowledge of the Panama Papers episode, which is never covered in the encouragement treatment.

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.

[23]We describe the encouragement sent to students in greater detail in Appendix C. Appendix Figure A.1, A.2, and A.3 present screenshots of the encouragement newsletters.

[24]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. We also ask students who is the author of that particular article, and which other article does the author publish on the *New York Times* during that week. In addition to the underground water pollution, other topics covered in the quizzes include: wealth inequality, censorship on key economic indicators, and labor unrest, all in the context of China.

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 encouragement treatment ended in March 2016, 6 weeks prior to the midline survey.[25] In other words, the encouragement treatment is temporary, and it creates 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 is no longer in place.

3.2 Outcomes: acquisition of uncensored information

We measure the impact of uncensored Internet access on students' media consumption according to the three 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;[26] and *(iv)* total time spent on each foreign website category, such as the Big 4 (Google, Facebook, YouTube, Twitter), news, entertainment, etc.[27]

One may be concerned that the browsing activities recorded by our server are systematically distorted due to participants' fear of being monitored by the researchers. We ensure study participants that the activities are recorded anonymously — rather than students' real identities, participants are only linked to the participant ID we generate upon recruitment. Several pieces of evidence suggest that the fear of being monitored is not a particularly salient concern. First, students who are encouraged to visit foreign news websites do not shy away from browsing politically sensitive content. For example, when students recognized that *The Economist* magazine was being 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*. Second, students do not hide browsing activities that may be considered socially undesirable. Approximately 77% of the study's male participants and 62% of its female participants use the censorship circumvention tool to browse pornography at least once — many pornographic websites are blocked by the Great Firewall.

However, 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

[25] 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.

[26] 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.

[27] We use the Alexa categorization of domain names. 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.

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.[28] 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 crowds out 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 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 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. In addition, we ask students to report whether they would purchase tools other than the one that we provide during the endline survey.

In contrast to the browsing activities on foreign websites, the access purchase and renewal behaviors allow us to compare the media consumption decisions across all study participants regardless of their treatment status or whether they adopt the access tool we provide. However, only students who complete the endline survey are offered the opportunity to renew or purchase the access service, and we discuss the attrition across different waves of the survey in Section 3.4.

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 a wide range of domains: *(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

In order to measure the effects once students are exposed to politically sensitive information, we repeatedly measure 4 broad outcome groups of interest in our panel survey.[29] Our surveys are intended to cover a comprehensive set of outcomes since the specific aspects of knowledge, beliefs, and attitudes that may be affected by foreign news consumption depend on the events that take place during the experiment.

[28] We present the actual wording of these questions along with other media-related outcomes in Appendix D, Panel A.

[29] Appendix D, Panels B-F, provide more detailed category by category descriptions. We also present the original wording (translated) of *all* questions that we asked in the panel survey, where we indicate the coverage across survey waves.

First, we assess a range of knowledge *(Panel B)* 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 *(Panel C)* 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 *(Panel D)*. 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 *(Panel E)*, such as their social interactions discussing political topics, political participation, investment in the Chinese stock market, and plans after graduation.[30]

In addition, we collect a rich set of demographics and background characteristics *(Panel F)* from the study participants. We also elicit participants' fundamental preferences including risk preferences, time preferences, and social preferences, following Falk et al. (2014). They serve as the basis for experimental balance checks and the criteria for heterogeneity analyses.

Self-censorship in answering sensitive questions Students may not answer questions on sensitive political attitudes honestly.[31] Several facts suggest that self-censorship in responding to our survey 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.[32] 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* 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.

[30] In a companion project, we analyze a set of observed behaviors with real stakes, in the form of incentive-compatible laboratory games. See Chen and Yang (2017) for more details.

[31] 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.

[32] We adopt a modified version of the standard list experiment. The modification is first introduced by Coffman, Coffman, and Ericson (2014) and subsequently adopted by Cantoni et. al. (2016, 2017). It appends "covered" elicitation with the traditional survey method (namely, the direct question): the control group students in our list experiment setup (those who see N statements instead of $N+1$) are asked the politically sensitive questions *directly* in the form of "yes" or "no." The exact statement that we use to elicit attitude in the list experiment is: "I completely trust the central government of China," and we report the percentage of "no" as indicators of those who do not trust the central government.

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* question from the baseline survey in the subsequent midline survey, apart from the demographic characteristics and fundamental preferences, which we do not expect to change during the study's duration. 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 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 dramatically reduce the number of hypotheses we test, we construct a z-score index variable for each of the subcategories of outcomes we examine.[33] 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. Finally, when we examine individual survey outcomes, we adjust p-values using the false discovery rate (FDR) procedure.[34]

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.[35] Recruitment is implemented via email and WeChat messages, and we end the recruitment process once the goal of 1,800 study participants has been reached.[36]

Potential participants are informed that this is an academic research project that involves repeated surveys over the course of 18 months, and that the study aims to understand Chinese college students' beliefs, attitudes, and behaviors during the age of globalization. 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 total, we successfully recruit 1,807 study participants who complete the baseline survey.[37] Among them, 1,490 are from the elite university (or 15% of its entire undergraduate population), and 317 are from the lower ranked university (or 3% of its entire undergraduate population).

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 ex-

[33] 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.

[34] The z-score index construction and the FDR adjustment procedure follow Anderson (2008) and Cantoni et al. (2017).

[35] 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.

[36] 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. We face severer 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. In particular, all of our baseline findings are robust to re-weighting the sample to match the composition of universities' actual student body.

[37] We restrict participation eligibility to full-time registered undergraduate students, and who are citizens of the People's Republic of China. No further eligibility restrictions are imposed. Appendix Table A.7 presents the summary statistics of the 1,807 students who have completed the baseline survey.

cludes 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 of the 1,476 non-existing users to the access treatment, and cross-randomize another two-thirds to receive the encouragement treatment.[38]

Midline survey *(May 2016)* We invite all participants to a midline survey 6 months after we distribute the treatment. The midline survey takes approximately 60 minutes to complete. Students are rewarded US$ 20 for participation, and an additional US$ 10 bonus payment, on average, depending on their survey answers. A total of 1,618 students complete the midline survey, implying a panel retention rate of 89.5%.[39]

Endline survey *(April 2017)* All participants are invited to an endline survey 18 months after the baseline survey. Similar to the midline survey, the endline survey takes approximately 60 minutes to complete, and students are paid US$ 20 for participation, and an additional US$ 20 bonus payment, on average, depending on their survey answers. Overall, 1,372 students complete the endline survey, implying a 75.9% retention rate since the baseline survey. These students constitute the paper's main sample throughout. Importantly, there is no selective attrition by treatment status (p-value = 0.782), and the majority of the results are robust when re-estimating the treatment effects using the midline survey with a less attrited panel sample.[40]

Table 1 presents the summary statistics for all study participants who have completed both the baseline and endline surveys (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 survey's demographics, background characteristics, and fundamental preferences section. We conduct an ANOVA test for the joint differences in means across the 4 experimental treatment groups, and report the F-statistics and p-values in column 8 and 9, respectively. 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 31 out of 37 characteristics examined.[41] The estimated treatment effects are robust to controlling for the imbalanced characteristics.

4 Does access increase acquisition of sensitive information?

4.1 Free provision of access alone does not increase acquisition

Close to 80% of the study participants — among students at one of China's highest ranked and most liberal universities — do *not* use tools to bypass censorship before the experiment starts. These tools, although

[38] We choose the one-to-two treatment ratio in order to maximize the power of the experimental design, accounting for the potential low take-up rate for the access and encouragement treatments. We stratify the randomization at the university-gender-cohort level. We do not stratify randomization at the university dorm room level to ensure that dorm room level variation exists in treatment penetration density, which allows us to estimate the social spillover of information.

[39] Appendix Table A.8 presents the summary statistics of the 1,618 students who have completed the midline survey.

[40] We present the summary statistics of demographics, background characteristics and fundamental preferences among the study participants who have completed the baseline survey, those who attrited during the midline survey, and those who attrited during the endline survey in Appendix Table A.9. The attrited participants are slightly more likely to be from richer households and more advantaged backgrounds, but the differences between the attrited and non-attrited participants are rarely statistically significant.

[41] The experimental treatment groups are imbalanced in their coastal residency prior to college, academic tracks during high school, parents' memberships in the Chinese Communist Party, the certainty equivalent of their lottery preference and the amount of reciprocal gifts they are willing to give.

generally inexpensive, still impose a non-zero monetary burden on students each month, many of whom may be under a relatively tight budget constraint.[42] Does providing these students with free access to uncensored Internet induce them to acquire sensitive information?

Only 53% of the students who receive the access treatment actually activate the tool, despite 6 rounds of repeated reminders.[43] 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 account via email and WeChat messages at the same time choose to activate that account within a week. Furthermore, if we define *active* usage as whether a student's account records at least one browsing activity per day for more than a fifth of the days since its activation, then about 14% of the students who activate the tool soon became non-active (Table 2, column 1).[44] This is very likely the result of deliberately choosing to uninstall the tool.

The *Group-A* students who actively use the tool to bypass censorship (or, the "compliers") are positively selected in terms of their English ability, oversea experiences, and household income.[45] Nevertheless, even among these active users, less than 5% regularly browse foreign news websites throughout the experiment.[46] In addition, there is no evidence that these students gradually start to browse foreign news websites even months after the tool is distributed, as we trace the total minutes these students spend on the *New York Times* each week throughout the experiment (Figure 1, solid blue line).[47] While these students spend on average 79.2 minutes per day browsing foreign websites, their browsing time 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.[48] This suggest that students are unlikely to treat these foreign websites other than the news outlets as primary sources of politically sensitive information.

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. This suggests that students' demand for sensitive information may be low to begin with, which we investigate next.

[42] In addition to monetary cost, there may also exist non-monetary cost such as effort cost due to search frictions — students might not know where to look for tools to bypass censorship, or unwelcoming features of some of the tools as they could slow down Internet connections. By offering students with a premium tool to bypass censorship, we effectively remove many of the non-monetary costs as well. We discuss political costs associated with using censorship circumvention tools in Section 4.4.

[43] Around 25% of the treated students activate the tool on the day we distribute the access treatment. Appendix Figure A.4 shows the cumulative activation rate of the censorship circumvention tool during the first 6 months of the experiment.

[44] While the criterion of "a fifth of the days" is arbitrary, the number of active users does not vary much if we use alternative criteria.

[45] Appendix Table A.10 presents results on examining whether demographics, educational background, household characteristics, fundamental preferences, and knowledge and media-related beliefs at the baseline survey predict students' decisions to use the access treatment tool.

[46] We define a student regularly browsing foreign news websites if she visits these websites more than twice per week on average. Appendix Figure A.5 shows the cumulative density plot of the average number of days that students visit the *New York Times* (both English and Chinese edition), and the average total minutes students spend on the website each week. There is very little browsing traffic towards other foreign news websites such as the *Wall Street Journal* Chinese edition, since many of them are paywall protected. In Appendix Table A.11, we present the same set of summary statistics on students' browsing behaviors of foreign websites, restricting the sample to study participants who have completed the endline survey. The results are qualitatively and quantitatively very similar to the ones that focus on the full sample.

[47] Appendix Figure A.6 shows the browsing time on all top foreign news websites throughout the experiment.

[48] Not all of these foreign websites are blocked by the Great Firewall. The top 4 websites that Group-A students 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.

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 15 percentage points (28%) more likely to activate the censorship circumvention tool, compared to those who are only given the access treatment (Table 2, Panel A, column 2).[49] More importantly, the financial encouragement to visit foreign news websites (particularly the Chinese edition of the *New York Times*) sharply increases the time students spend on that outlet during the encouragement period. The solid red line in Figure 1 traces the average time spent on the *New York Times* every week among students who receive both the access and encouragement treatments (*Group-AE*). Once we add small monetary incentives during the 2nd phase of the encouragement treatment, we observe a large divergence between students in *Group-A* and *AE*: *Group-AE* students spend 5.6 minutes on the *New York Times* per week during the incentivized encouragement period (represented by the darker shaded area in Figure 1).[50]

While the 1st phase of the encouragement systematically introduces students to a variety of blocked media outlets including the *New York Times* Chinese edition, the lack of response during this purely informational phase indicates 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. The monetary incentives during the 2nd phase of the encouragement effectively boost the demand to visit foreign news websites, prompting students to visit the Chinese edition of the *New York Times* — many for the first time — to find answers to the quizzes. Note that this is unlikely to be driven by general shifts in students' demand for foreign news that precisely coincide with the time when we enter the 2nd phase of the encouragement treatment, because we do not observe a sharp change among *Group-A* students days after the switch.

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 and remains substantial. Throughout the remaining 14 months of the experiment, when direct monetary incentives to visit foreign news websites are no longer in place, students in *Group-AE* who activate the censorship circumvention tool spend on average 4.4 more minutes on the *New York Times* per week, or an increase by 425% compared to their counterparts in *Group-A* (shown in Figure 1; p-value < 0.001).[51] 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 spending long hours on the *New York Times*, and the comparison of the median student who activate the tool demonstrates an even sharper difference.[52] This is a substantial increase, considering that the 0.9 million

[49] Appendix Figure A.4 shows the divergence in the cumulative activation rate of censorship circumvention tool between students in *Group-A* and *Group-AE* over time. As shown in Table 2, Panel B, the marginal students who activate the censorship circumvention tool due to the encouragement treatment are negatively selected in terms of the overall browsing time they spend on foreign websites.

[50] Traffic to the *New York Times* spikes on the days when we send out the incentivized quizzes, which is less obvious as we aggregate students' browsing time on the *New York Times* throughout the week. Appendix Figure A.7 traces the percentage of active and regular browsers of the *New York Times* over time, and one observes similar pattern of divergence between treated students who receive encouragement and those who do not, after the distribution of incentivized quizzes.

[51] This increase in browsing time cannot be accounted for by the temporal changes in the percentage of students who regularly visit the *New York Times*, because around 70% of the active users of the censorship circumvention tool consistently visit the *New York Times* at least twice a week. We plot this extensive margin over time in Appendix Figure A.7.

[52] Appendix Figure A.5 compares the overall distribution of the total time spent and number of visits to the *New York Times* per week, between *Group-A* and *Group-AE* students. While the median student in *Group-A* browses the *New York Times* for 0.4 minutes per week, her counterpart in *Group-AE* spends 6.0 minutes per week, an increase of 1,334%. Students in the *AE* group also self-report in

paid subscribers of the *New York Times* in the US spend, on average, 12.9 minutes per week on the website.[53]

The increase in the *New York Times* browsing time is unlikely a result of *Group-AE* 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. In addition, the increase in foreign news consumption does not seem to substantially crowd out the time *Group-AE* students spend on domestic news websites. While we do not directly observe browsing activities on domestic websites, both the midline and endline surveys indicate that domestic social media remains as *Group-AE* students' (self-reported) primary source of information. Moreover, we show in Section 5.1 that foreign news consumption does not crowd out knowledge of news events reported only on domestic websites.

The encouragement to visit the *New York Times* leads students to seek out information from blocked websites beyond the one we directly encourage them to visit. In particular, *Group-AE* students begin to spend more time on Wikipedia. Table 2, Panel B, column 3 compares the average daily browsing time on various categories of foreign websites between students in the *A* and *AE* groups. Students in *Group-AE* who actively use the censorship circumvention tool spend on average 69.1 minutes on (any) foreign website every day, similar to their counterparts in *Group-A*. In fact, beyond the *New York Times*, the only other distinctive dimension in browsing activities that separate students in *Group-AE* from those in *Group-A* is the time they spend on Wikipedia.[54] 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. 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*.

***Group-AE* students respond to news shocks** To directly test whether the *New York Times* allows students to acquire political sensitive information, we examine the extent to which *Group-AE* students respond to sensitive news shocks. We first measure "news peaks" as the share of articles published on the *New York Times* Chinese edition that report politically sensitive events not covered by domestic Chinese news outlets. 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 plot this measure in the dotted line in Figure 1, where we superimpose it on students' browsing time on the *New York Times* during the corresponding week.

The time *Group-AE* students spend on the *New York Times* closely tracks the percentage of politically sensitive articles published during that week.[55] 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,

the endline survey that they visit foreign news outlets more frequently to obtain information.

[53]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.

[54]While students in *A* and *AE* groups spend similar amounts of time on foreign social media outlets, such as Facebook and Twitter, it is likely that *Group-AE* students begin to consume different types of information on these platforms, which complement their consumption on the foreign news websites. We unfortunately cannot observe what students browse on Google, Twitter and Facebook since traffic towards these websites is encrypted.

[55]Appendix Table A.12 presents regression analyses on the relationship between political news shocks and students' browsing time on the *New York Times* and the other foreign news websites in the corresponding week. Note that average browsing time on the *New York Times* among *Group-A* students also rises slightly during the news peaks, but the increase is of a much smaller magnitude and is primarily driven by the US Presidential Election in 2016 and two week-long national holidays during the experiment.

respectively.[56] 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 stable frequency, but spend additional time browsing during the weeks when there are more news articles they have not yet seen on domestic news websites.[57]

Encouragement raises demand for uncensored Internet access The persistent increase in students' acquisition of uncensored information caused by the encouragement treatment may be a result of their raised demand for such information. 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 and over time. Figure 2 plots the willingness to pay in US$ per month, repeatedly elicited using a BDM method during the baseline, midline, and endline surveys. 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. The willingness to pay remains stable throughout the experiment among existing users and students in the *C*, *CE*, and *A* groups. However, students who receive both the access and encouragement treatments increase their willingness to pay by US$ 1.05 per month, or 34%, considerably closing the gap with that of existing users.

Group-AE students' increased demand is further corroborated by their decisions to purchase uncensored Internet access. At the end of the 18-month experiment, we provide all study participants with an opportunity to purchase or renew their subscription to access uncensored Internet. The darker bars in Figure 3 show the percentage of students who *actually* purchase or renew the premium censorship circumvention tool subscription we offer during the experiment. Approximately 23% of the *Group-AE* students renew their access, and they pay on average US$ 21.50 up front for a seasonal subscription. This is a significantly higher renewal rate compared to that among the *Group-A* students.[58] If we count the students who intend to purchase censorship circumvention tools other than the one we provide (shown in the lighter bars in Figure 3), then 52% of the *Group-AE* students (or 80% among the active users) are likely to continue having access to uncensored Internet after the experimental intervention ends, in contrast to their lack of interest 18 months earlier. In other words, the access treatment coupled with the temporary encouragement results in a lasting increase in students' access to uncensored Internet and acquisition of uncensored information.

However, *Group-AE* students' raised demand for uncensored Internet access is not entirely driven by their desire to acquire uncensored information. Nearly 21% of the *Group-A* students (or 45% among the active users) also renew their access at the end of the experiment. 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 is a nonnegligible component of *Group-AE* students' raised demand.

[56] Conversely, during weeks when a small number of politically sensitive news stories are reported (e.g. the week of July 4th, 2016), the week of the 2016 Rio Olympics, and week-long national holidays when the *New York Times* Chinese edition does not publish any new articles (e.g. the 2017 Chinese New Year), *Group-AE* students spent significantly less time on the *New York Times* website.

[57] This is consistent with how *Group-AE* students rank the relative importance of various news outlets to their information acquisition on the endline survey, shown in Figure 4. *Group-AE* students do *not* rely on foreign news websites as their primary source of information, and we conjecture that they browse domestic news outlets more frequently throughout the day.

[58] Less than 1% of students in *Group-C* 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 information friction (e.g. they may not have heard of this particular premium tool before) and price discounting (e.g. the discounted subscription may be cheaper than what they were using at that moment).

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. 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.[59]

An important — although not necessarily exclusive — reason students exhibit low demand for uncensored information and are unwilling to pay for access 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 different 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.

We compare the average answers to this question among different groups of students over time, in Figure 4, Panel A, 2nd graph. 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, as *Group-AE* students become exposed to reputable foreign news outlets, they raise their assessment of the value of foreign news outlets significantly by the midline survey, converging towards that of existing users. Hence, the low demand for uncensored information is potentially an outcome of under-exposure to foreign news outlets, as they have been blocked by the Great Firewall for years.[60]

We observe similar belief patterns across many dimensions of media-related beliefs.[61] For example, students in *Group-AE* become more likely to believe that content on domestic media outlets is heavily censored. Relatedly, they become less likely to trust domestic media outlets in China (either state-owned or privately-owned), and more likely to trust foreign media outlets. These changes first emerge during the midline survey and persist to the endline survey. In addition, students in the *C* group are indistinguishable

[59] This echoes a more general theory that people are driven for knowledge due to curiosity, especially when they are drawn to think about certain issues or perceive "information gaps" (Golman and Loewenstein, 2015).

[60] In addition to underexposure, we speculate that a particularly important factor contributing to students' negative beliefs towards foreign news outlets 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.

[61] We compare all dimensions of these beliefs across different groups of students over time: first in Figure 4, Panel A, where we summarize beliefs belonging to each category using a z-score index; then in Figure 5, where we present each individual dimension of these (standardized) beliefs. Finally, we present the regression estimated results on non-standardized outcomes in Appendix Table A.13, Panel A. As we note before, *not* all questions in the panel survey are covered in the endline survey. We report regression estimates of all midline survey outcomes in Appendix E.

from those in the *CE* group in terms of their media-related beliefs measured during midline and endline surveys, which assuage the concern that the belief updating among *Group-AE* students is driven by the experimenter's demand effect over the encouragement materials.[62]

The patterns concerning students' media-related beliefs suggest that students hold downwardly biased beliefs on the value of foreign news outlets prior to their exposure to these outlets. Such beliefs are updated once students begin to consume information on foreign news outlets.[63]

In Appendix F, we develop a formal model of students' consumption of foreign news outlets using the one-armed bandit problem framework.[64] Following this framework, if students sufficiently underestimate the value of foreign news outlets, they may never choose to acquire information from there. 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 other hypotheses that may explain the persistent increase in demand for, and consumption of, uncensored information. For example, visiting foreign news websites may be associated with a one-time, substantial mental cost. Another prominent candidate is habit formation that features intertemporal complementarity in consumption. 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 (or learning the value of foreign news outlets) that we document.[65]

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. However, 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. We compare, across students in different groups during the endline survey, outcomes that are elicited in a private manner, removing various social incentives (such as signaling, coordinating, conforming) that may affect students' answers. For example, we ask students to "bet" on China's stock market performance privately, and then

[62] The comparisons are presented in Appendix Figure A.9.

[63] This is consistent with the hypothesis that citizens in authoritarian regimes do not discuss alternative information sources with each other, because they do not know what others believe (Kuran, 1997). We explicitly investigate students' beliefs regarding others in a companion paper, Chen and Yang (2017).

[64] 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.

[65] We discuss, in greater detail, habit formation, and in particular, whether rational addiction can account for the persistent increase in consumption of uncensored information in Appendix G.

reward them with a bonus payment completely determined by the accuracy of their private bet, unrelated to how other participants of the study perform in terms of their guesses.

The comparison results, representing the *intent-to-treat* effects, are presented first in Figure 4, Panel B (knowledge), C (economic beliefs), D (political attitudes), and E (behaviors), where we summarize outcomes in each category with an z-score index; then in Figure 6, 7, and 8 for each individual outcome, where we standardize across outcomes for ease of comparison.[66]

More informed of sensitive events We find that 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 than those in the *C* or *A* groups. Importantly, the quizzes are able to capture *Group-AE* students' knowledge stock, because their access subscription terminates just before the endline survey, and they cannot look up answers on Google or the *New York Times* during the survey (unless they purchase the censorship circumvention tool on their own). 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. 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 students who do not acquire uncensored information are already broadly informed of current affairs.

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, we find that *Group-AE* students begin to acquire information on sensitive historical events by visiting blocked websites such as Wikipedia. They 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)*.[67] As a placebo, we ask students whether they have heard of the "Tomorrow Revolution", a fake protest we create. The overall proportion of students who indicate that they have heard of this event is indistinguishable from zero, and we find no evidence that exposure to uncensored information makes students more likely to indicate awareness of this event.

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 become more *optimistic* about other students' level of informedness. We explicitly study this optimism towards others, its implications on higher order beliefs, and consequences on coordination outcomes in a companion paper (Chen and Yang, 2017).[68]

[66] We pool students in *C* and *CE* groups together as they do not differ from each other across almost any dimension. The pooled group is labeled as *Group-C*. Appendix Figures A.10, A.11 and A.12 present results comparing *C* (unpooled) and *CE* students. We report the regression estimates on non-standardized outcomes in Appendix Table A.13, Panel B, C, D, and E, respectively. We also present results from regressions controlling for the demographic and background characteristics that are imbalanced across treatment groups, as well as students' answers to these questions in the baseline survey, if applicable. We report regression estimates of all outcomes from the midline survey in Appendix E.

[67] See, among others, King, Pan, and Roberts (2013) and Tai (2015) for evidence on censorship of protests and coordination efforts.

[68] In particular, we find that when asked to guess the percentage of news quizzes correctly answered by other participants of the

More pessimistic about China's economic performance When students are asked to guess China's GDP growth rate in 2017 (in an incentive-compatible and private 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, since it falls below the government's explicit target (6.50%) and predictions by the Chinese Academy of Social Sciences (6.60%).[69] 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 their predictions).

Contrary to the increased pessimism on China, exposure makes *Group-AE* students more optimistic about the US economic performance (again elicited in an incentive-compatible and private manner). Their prediction about the US GDP growth rate during 2017 is 1.19 percentage points higher than that of *Group-C* students, and their prediction about the closing level of the Dow Jones Index at the end of 2017 is 1,837.8 index points higher.[70]

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

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, persuasion effects on political attitudes are observed across a broad range of dimensions. 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)*.

study, *Group-C* and *Group-A* students do not believe that students who have never used the censorship circumvention tool have significantly different knowledge levels compared to those who have been using the tool before the experiment starts. This corroborates our results in Section 4.4: an important reason for low demand for uncensored Internet access is that students do not realize that uncensored information can make a difference.

[69] 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.

[70] We observe a pattern of anchoring when students guess the GDP growth rate in the US. Many halve their guess of China's GDP growth rate to form their guess about the US growth rate — making the average guess on the US GDP growth rate 2.69% among our study subjects, which is considerably higher than the historical growth rate (1.60% in 2016). This is probably because most students have no prior knowledge of the scale of US GDP growth. As a result, students more optimistic about the US were actually moving *away* from the true growth rate.

Changes in behaviors and planned behaviors Finally, we find that acquiring uncensored information leads to changes in students' 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.3)*; and more likely to report, among the 5% of students who are invested in the Chinese stock market, that they have pulled out their investments *(Category E.5)*.[71] *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.4)*.[72]

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% students in *C* and *A* groups who report having such plans *(Category E.6)*. 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.7)*.

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) and the time frame (e.g. 2016 and 2017 are two unusually eventful years). With this in mind, the *local* effects of acquiring politically sensitive information that we identify are substantial in magnitude. As evident from Figure 4, nearly 80% of the gaps between students newly exposed to uncensored information and the existing users in terms of their knowledge, economic beliefs, political attitudes, and behaviors disappear by the end of the experiment. Given that 46.9% of the *Group-AE* students regularly browse foreign news outlets to acquire information, one would need to double the scale of these *intent-to-treat* estimates to obtain the corresponding *treatment-on-the-treated* estimates.[73] In addition, it is important to note that convergence with existing users does *not* necessarily mean converging towards truth, provided that the *New York Times* has a strong liberal slant (e.g. Groseclose and Milyo (2005) and Gentzkow and Shapiro (2010)).

Another way to quantify the magnitude of the treatment effects is to measure the quantile movement of a median *Group-AE* student. 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 55th percentile of the distribution by the endline survey.[74]

Yet another way to benchmark the effects is to compute the "persuasion rate" following DellaVigna and Gentzkow (2010), which indicates the estimated percentage of students who do not initially hold, say, skeptical attitudes towards the Chinese government ("uncensored attitude") but change their attitudes once they acquire uncensored information as a result of the experimental treatments. For each outcome of interest, we calculate this as the *treatment-on-the-treated* effect of the access plus encouragement treatments,

[71] 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 investments 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.

[72] We speculate that this is due to the fact that protest movements are rarely organized in China, especially in Beijing where most of our study participants reside. In fact, less than 5% of the students report that they have ever participated in a protest.

[73] However, this does *not* suggest the newly exposed students necessarily "overshoot" beyond the existing users, because not all existing users circumvent censorship explicitly to seek out politically sensitive information.

[74] Appendix Table A.14 presents the quantile movement calculated for each category of outcomes of interest.

divided by the share of *Group-AE* students who do not hold "uncensored attitudes" at the time of the baseline survey.[75] We find that the median persuasion rate across all outcomes of interest is 44.8%.[76] This is considerably larger compared to the persuasion rates estimated with respect to media in democratic societies, but on a similar magnitude as those found in authoritarian regimes that typically have highly regulated media markets.[77]

5.1.2 Heterogeneity in the treatment effect on knowledge

To investigate who is more affected by politically sensitive information, we compare the treatment effect on students' knowledge of politically sensitive events across different subgroups. Specifically, we re-estimate the treatment effect on subsamples split according to all demographic characteristics and fundamental preferences elicited in the baseline survey, as well as students' knowledge prior to the experiment.[78]

Figure 9 presents the estimated effect for each pair of the subsamples. Broadly speaking, the treatment effect is larger among students from relatively more disadvantaged backgrounds — those who grow up in non-coastal (less developed and less liberal) or rural regions prior to coming to college in Beijing; those who have not been to Hong Kong, Taiwan, or other foreign countries during the past three years; and those who are brought up by poor, uneducated, and politically unconnected parents. These students potentially lack alternative access to uncensored information, and hence, exposure induced by the experiment could lead to more dramatic shocks to their knowledge and beliefs. Moreover, acquisition of uncensored information is more likely to increases knowledge among students who start off less informed. This suggests that the treatment effect is 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.

It is worth highlighting that the treatment effect on knowledge is positive even among students from more advantageous backgrounds or those who are already fairly informed prior to the treatment. This indicates that while alternative access to uncensored information could be substitutable for direct exposure, it does not completely crowd out the latter.

While we believe that the group of students we study are of particular interest since their views are most likely to shape Chinese political discourse in the future, the heterogeneity analyses results suggest that 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 effect to be larger than that for other Chinese citizens. On the other hand, many of our study participants come from advantageous backgrounds and are already fairly informed, even prior to the experimental intervention, which implies that our estimated effect may actually be smaller than the average effect among all Chinese citizens.

[75] For a binary outcome variable, this is straightforward. For questions that do not have a binary outcome, we calculate the persuasion rate 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.

[76] Appendix Table A.15 presents the persuasion rate estimated for each category of outcomes of interest.

[77] 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).

[78] We do this so long as the split provides sufficient statistical power. For example, we do not split sample according to students' membership in the Chinese Communist Party — only 6% of the study participants are party members. The demographic characteristics and fundamental preferences are described in Appendix D, Panel F. We compare *Group-AE* students with a pooled sample of students in the *C*, *CE*, and *A* groups. Similar patterns emerge for the treatment effects on other outcomes of interest, which we do not have space to present here. Additional heterogeneity analysis results are available from the authors upon request.

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 (e.g. Miguel and Kremer (2004)). More importantly, the rate of information transmission enables us to assess whether a small number of citizens who acquire uncensored information are sufficient to spread such information to a majority of the population.

To study this question, we focus on the social network of college dorm roommates.[79] While our experimental design does not allow us to map a complete social network (in particular, the friendship networks), the dorm room networks we capture are in fact more closely aligned with the "conversation networks," which are demonstrated to play a dominant role in social transmission of information among university students (Mobius, Phan, and Szeidl, 2015). Overall, 57% of students who do not receive access and encouragement treatments reside with at least one roommate who is treated; and 42% of treated students reside with at least one roommate who is also treated.

Simple comparative statistics suggest that the social transmission of information is indeed present. Take as an example the students' knowledge on the Panama Papers. Among students who do not receive the access and encouragement treatments, and do not have any roommate who receive such treatment, 56% of them can correctly answer the "true or false" quiz. If the students have one roommate who receives the treatment, the proportion increases to 78%. To quantify the rate of social transmission of uncensored information within the network of university dorms, we next 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: *(i)* the probability that she learns the event from browsing foreign news outlets himself *(direct learning)*; and *(ii)* the probability that she learns about the event from her roommates, who have access to uncensored Internet and have learned about the event *(social learning)*. Specifically, we formulate the following linear probability model:

$$Correct_{ij}\Big(I_i(own), N_i(roommate)\Big) = \alpha_j + I_i \cdot p_j + \Bigg(1 - \Big((\alpha_j + p_j)(1 - q_{j,I_i}) + (1 - \alpha_j - p_j)\Big)^{N_i}\Bigg)$$

where $I_i(own) \in \{0, 1\}$ indicates whether a student has access to uncensored information himself 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

[79] College roommates are vital components of the social interaction and social networks experienced by typical Chinese college students. 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 roommates are very likely to be randomly assigned within the university-gender-cohort-major cell.

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 himself 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 third 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 — $(\alpha_j + p_j)(1 - q_{j,I_i})$, or the roommate is not informed himself in the first place — $(1 - \alpha_j - p_j)$. The parameter q_{j,I_i} captures the rate of social transmission of knowledge. One can see that when $N_i(roommate) = 1$, the social learning term q_{j,I_i} equals the rate of social transmission times the probability that a roommate with direct access to uncensored information becomes informed of the censored event himself. We allow q_{j,I_i} to differ between students who have direct access themselves and those who don't. We make three 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 that there is no information transmission from students who do not have direct access to uncensored Internet since it is not separately identifiable. Alternatively, one may interpret the social transmission rate we estimate as the *relative* transmission compared to that from a student who does not have direct access to the uncensored Internet. Third, 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 and estimation results 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.

We present the parameter estimation results for each of the 11 politically sensitive news events in Table 3, Panel A. The rate of direct learning (p_j) is estimated to be as high as 0.333 for the Panama Papers episode, and as low as 0.084 for the 2016 domestic steel production target failure.

Three patterns emerge with respect to the social transmission of information. First, we find that the knowledge spillover of many sensitive news events among college roommates is significantly different from zero. Overall, averaged across all 11 news dimensions, the transmission rate from an informed student with direct access to her roommates who do not have access is 12.7%. Interestingly, this is a very similar

social transmission rate of politically neutral information among Harvard undergraduates (10.3%; Mobius, Phan, and Szeidl (2015)). 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. This is best illustrated in Figure 10, where we plot the estimated direct learning rates for each news dimension against its corresponding social transmission rate. If a student is more likely to learn about particular sensitive news event himself, she is also more likely to transmit her knowledge to her roommates. Third, the social transmission rate approximately doubles if the recipient is a fellow roommate who has no direct access himself, suggesting social substitutability in learning with respect to direct access to uncensored information.

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 each of the 11 news events in Table 3, Panel B, where we also show the actual percentage of students who correctly answer the quiz questions in the corresponding subgroup. 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.

6 What makes censorship effective? A simulation exercise

The results we present thus far allow us to get a glimpse into what makes the censorship apparatus in China effective, despite its porousness. Would all the students become informed of sensitive events if censorship were to be removed among a large share of them? Would students' low demand for uncensored information be partially offset by the social transmission of information?

To illustrate, we measure the censorship apparatus' ability to block information as the share in the entire student population who would be able to correctly answer quiz question on the Panama Papers, a particularly high-profile, sensitive news event. We simulate this share in response to the percentage of students actively acquiring uncensored information growing from 0 to 100.[80]

We incorporate the social transmission of information among dorm roommates. This captures the vast majority of the information transmission across students' conversation networks, which we demonstrate at the end of this section. Specifically, we first construct the dorm room structure of the student population in order to simulate the number of information-acquiring roommates with whom a particular student may reside. For each student, we predict whether she could correctly answer the quiz on the Panama Papers if there is no social transmission of knowledge. We then predict the number of roommates a particular student resides with who have acquired the knowledge about the Panama Papers. This allows us to predict the chance that she could correctly answer the quiz if her informed roommates transmit the knowledge, according to the social learning model described in Section 5.2. We calibrate the social learning model

[80] We describe the simulation procedure in detail in Appendix H.

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.

Importantly, these estimated parameters capture partial equilibrium effects, since our experiment covers only 15% of the student population. On one hand, the general equilibrium treatment effects may be substantially larger due to factors such as the elimination of political fear, shifts in social norms, or social learning regarding the quality of uncensored Internet access. On the other hand, the general equilibrium effects may also be smaller in magnitude, as the government and the censorship apparatus itself may respond (e.g. providing access to the entire population triggers a crackdown from the government).

Figure 11 presents the simulation results. There are two important benchmarks. First, a *status quo* benchmark: 21% of the students purchase censorship circumvention tools and seek out sensitive information, and a corresponding share of 65% of students on the entire campus would be able to correctly answer the quiz question. Note that since the quiz responses are binary, students have a 50% chance of answering the quiz correctly even if they click randomly. This should be taken into account when one infers the underlying "true" knowledge of the news events based on the quiz outcomes. Second, a *full-saturation* benchmark: when 80% students actively browse foreign news sites, all students would be able to correctly answer the quiz question due to a combination of direct learning and the social transmission of knowledge.

We simulate three scenarios. 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. This suggests that the current censorship apparatus is fairly robust in maintaining its effectiveness. Even if the Great Firewall ceases to operate for a short period of time, most students would *not* take the opportunity to actively seek out uncensored information.

Second, if we were to provide all students with access and the same temporary encouragement we give during our experiment, the share of students who could correctly answer the quiz question would jump by another 30 percentage points to 98%, substantially approaching the *full-saturation* benchmark. 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%, very close to the *full-saturation* benchmark. These two scenarios demonstrate that while the current censorship apparatus is robust due to lack of demand for uncensored information, its effectiveness could be substantially and persistently diminished if demand were raised through encouragement and exposure.

To quantify the role the social transmission of information plays in destabilizing the censorship apparatus, we simulate a counterfactual scenario with no social spillover. This is shown in the dotted line in Figure 11. 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. This is because existing users of censorship circumvention tools are highly clustered in their dorm rooms, consistent with the pattern that access to uncensored Internet is socially complementary.[81] Such a high degree of clustering limits the scope of social transmission, as

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

the roommates of an informed student are likely to have access to uncensored Internet and have already acquired sensitive information on their own.

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. This is aligned with the findings from Mobius, Phan, and Szeidl (2015). In addition, when we replace the dorm room networks with the conversation networks mapped among Harvard undergraduates, we find the results quantitatively similar to those that rely on dorm room network alone, presumably because the number of roommates (3) is close to the average number of conversational links (3.19) a Harvard undergraduate would process. In fact, our result is robust even if we double the number of conversational links a student may have.[82]

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 may speculate that censorship becomes irrelevant in the age of the Internet where access blockage becomes increasingly costly and technologically challenging, and the regimes limit but do *not* eliminate access to information. In this project, we conduct a field experiment among college students in China to examine the impact of removing the Internet censorship that they face. 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.

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, the current level of demand is 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 one envisions.[83] 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.

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. Removing the Great Firewall could also raise the demand for uncensored informa-

tools, only 26.7% of them have at least 1 other roommate (and 9.3% with 2 or more) who are current users.

[82] See Appendix H for details on these robustness simulations.

[83] The Lantern Project, funded by the US State Department, aims to provide a stable Internet connection that bypasses censorship at a relatively low cost.

tion by signaling to citizens the quality of foreign media, making foreign media consumption more socially acceptable or inducing shifts in domestic outlets' news reporting. The demand for uncensored information, once raised, is likely to persist and can generate substantial pressure on the censorship apparatus.

This demand-driven censorship is not unique to contemporary China.[84] 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? 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).

[84] Many countries are trying to imitate the censorship practice of the Chinese regime. In addition, China is actively "exporting" its Internet censorship technology. For example, Cuba, Zimbabwe, and Belarus have received censorship technological assistance from China, according to the *Reporters Without Boarders*. More recently, China is in close touch with Russia to aid its Internet censorship capacity (*The Guardian*, November 29, 2016).

References

Abramitzky, Ran and Isabelle Sin. 2011. "Book translations as idea flows: The effects of the collapse of Communism on the diffusion of knowledge." *Discussion Papers* .

Adena, Maja, Ruben Enikolopov, Maria Petrova, Veronica Santarosa, and Ekaterina Zhuravskaya. 2015. "Radio and the Rise of the Nazis in Prewar Germany." *Working Paper* :1–134.

Alesina, Alberto and Nicola Fuchs-Schündeln. 2007. "Good-Bye Lenin (or Not?): the Effect of Communism on People's Preferences." *American Economic Review* 97 (4):1507–1528.

Anderson, Michael L. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103 (484):1481–1495.

Athey, Susan and Markus Mobius. 2012. "The Impact of News Aggregators on Internet News Consumption: The Case of Localization." *Working Paper* :1–36.

Bai, Jie, Mikhail Golosov, Nancy Qian, and Yan Kai. 2015. "Understanding the Influence of Government Controlled Media: Evidence from Air Pollution in China." *Working Paper* :1–33.

Becker, Gary S and Kevin M Murphy. 1988. "A Theory of Rational Addiction." *Journal of Political Economy* 96 (4):675–700.

Berry, Donald A and Bert Fristedt. 1985. *Bandit Problems: Sequential Allocation of Experiments*. Dordrecht: Springer Netherlands.

Cantoni, Davide, Yuyu Chen, David Y. Yang, Noam Yuchtman, and Y Jane Zhang. 2017. "Curriculum and Ideology." *Journal of Political Economy* 125 (2).

Chen, Yuyu and David Y. Yang. 2015. "Historical Traumas and the Roots of Political Distrust: Political Inference from the Great Chinese Famine." *Working Paper* .

———. 2017. "The Coordination Consequences of Media Censorship: Experimental Evidence from China." *Working Paper* :1–9.

Chiang, Chun-fang and Brian Knight. 2011. "Media Bias and Influence: Evidence from Newspaper Endorsements." *The Review of Economic Studies* 78 (3):795–820.

Coffman, Katherine B, Lucas C Coffman, and Keith M Marzilli Ericson. 2014. "The Size of the LGBT Population and the Magnitude of Anti-Gay Sentiment are Substantially Underestimated." *Working Paper* :1–50.

DellaVigna, Stefano and Matthew Gentzkow. 2010. "Persuasion: Empirical Evidence." *Annual Review of Economics* 2 (1):643–669.

DellaVigna, Stefano and Ethan Kaplan. 2007. "The Fox News effect: Media bias and voting." *The Quarterly Journal of Economics* 122 (3):1187–1234.

Diamond, Larry. 2010. "Liberation Technology." *Journal of Democracy* 21 (3):69–83.

Dupas, Pascaline. 2014. "Short-Run Subsidies and Long-Run Adoption of New Health Products: Evidence From a Field Experiment." *Econometrica* 82 (1):197–228.

Eckel, Catherine C and Philip J Grossman. 2008. "Forecasting Risk Attitudes: an Experimental Study Using Actual and Forecast Gamble Choices." *Journal of Economic Behavior & Organization* 68 (1):1–17.

Enikolopov, Ruben, Alexey Makarin, and Maria Petrova. 2016. "Social Media and Protest Participation: Evidence from Russia." *Working Paper* :1–64.

Enikolopov, Ruben, Maria Petrova, and Konstantin Sonin. 2016. "Social Media and Corruption." *Working Paper* :1–55.

Enikolopov, Ruben, Maria Petrova, and Ekaterina Zhuravskaya. 2011. "Media and Political Persuasion: Evidence from Russia." *American Economic Review* 101 (7):3253–3285.

Enke, Benjamin. 2017. "Complexity, Mental Frames, and Neglect." *Working Paper* :1–67.

Falk, Armin, Anke Becker, Thomas Dohmen, David Huffman, and Uwe Sunde. 2014. "An Experimentally-Validated Survey Module of Economic Preferences." *Working Paper* :1–68.

Ford, Guy Stanton. 1935. *Dictatorship in the Modern World*. Minneapolis: The University of Minnesota Press.

Foster, Andrew D and Mark R Rosenzweig. 2010. "Microeconomics of Technology Adoption." *Annual Review of Economics* 2 (1):395–424.

Fuchs-Schündeln, Nicola and Matthias Schündeln. 2015. "On the Endogeneity of Political Preferences: Evidence From Individual Experience with Democracy." *Science* 347 (6226).

Geddes, Barbara and John Zaller. 1989. "Sources of popular support for authoritarian regimes." *American Journal of Political Science* .

Gehlbach, Scott and Konstantin Sonin. 2014. "Government control of the media." *Journal of Public Economics* 118 (C):163–171.

Gentzkow, Matthew and Jesse M. Shapiro. 2006. "Media Bias and Reputation." *Journal of Political Economy* 114 (2).

———. 2010. "What Drives Media Slant? Evidence From US Daily Newspapers." *Econometrica* 78 (1):35–71.

Gerber, Alan S, Dean Karlan, and Daniel Bergan. 2009. "Does the Media Matter? A Field Experiment Measuring the Effect of Newspapers on Voting Behavior and Political Opinions." *American Economic Journal: Applied Economics* 1 (2):35–52.

Giuliano, Paola and Antonio Spilimbergo. 2014. "Growing Up in a Recession." *The Review of Economic Studies* 81 (2):787–817.

Golman, Russell and George Loewenstein. 2015. "Curiosity, Information Gaps, and the Utility of Knowledge." *Working Paper* :1–25.

Groseclose, Tim and Jeffrey Milyo. 2005. "A measure of media bias." *The Quarterly Journal of Economics* 120 (4):1191–1237.

Guriev, Sergei and Daniel Treisman. 2015. "How Modern Dictators Survive: Co-optation, Censorship, Propaganda, and Repression." *NBER Working Paper* :1–39.

Hobbs, William and Margaret E Roberts. 2016. "How Sudden Censorship Can Increase Access to Information." *Working Paper* :1–29.

Huang, Haifeng and Yao-Yuan Yeh. 2017. "Information from Abroad: Foreign Media, Selective Exposure and Political Support in China." *British Journal of Political Science* 85:1–26.

King, Gary, Jennifer Pan, and Margaret E Roberts. 2013. "How Censorship in China Allows Government Criticism but Silences Collective Expression." *The American Political Science Review* 107 (02):326–343.

———. 2014. "Reverse-engineering censorship in China: Randomized experimentation and participant observation." *Science* 345 (6199):1251722–1251722.

Kuran, Timur. 1997. *Private Truths, Public Lies*. The Social Consequences of Preference Falsification. Harvard University Press.

Miguel, Edward and Michael Kremer. 2004. "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." *Econometrica* .

Mobius, Markus, Tuan Phan, and Adam Szeidl. 2015. "Treasure Hunt: Social Learning in the Field." *Working Paper* :1–41.

Mullainathan, Sendhil and Andrei Shleifer. 2005. "The Market for News." *American Economic Review* 95 (4):1031–1053.

O'Donoghue, Ted and Matthew Rabin. 2001. "Addiction and Present-Biased Preferences." *Working Paper* :1–53.

Pan, Jennifer. 2016. "How Market Dynamics of Domestic and Foreign Social Media Firms Shape Strategies of Internet Censorship." *Problems of Post-Communism* :1–22.

Prat, Andrea and David Strömberg. 2013. "The Political Economy of Mass Media." *Working Paper* :1–57.

Qin, Bei, David Strömberg, and Yanhui Wu. 2016. "Media Bias in China." *Working Paper* :1–43.

Roberts, Margaret E. 2016. "Rerouting the Masses: The Powerful Influence of Porous Censorship in China." *Working Paper* :1–205.

Schedler, Andreas. 2009. "Authoritarianism's Last Line of Defense." 21 (1):69–80.

Shadmehr, Mehdi and Dan Bernhardt. 2015. "State Censorship." *American Economic Journal: Microeconomics* 7 (2):280–307.

Tai, Qiuqing. 2015. "Western Media Exposure and Chinese Immigrants' Political Perceptions." *Political Communication* :1–20.

Voigtlander, Nico and Hans-Joachim Voth. 2015. "Nazi indoctrination and anti-Semitic beliefs in Germany." *Proceedings of the National Academy of Sciences of the United States of America* 112 (26):7931–7936.

Yanagizawa-Drott, David. 2014. "Propaganda and Conflict: Evidence from the Rwandan Genocide." *The Quarterly Journal of Economics* 129 (4):1947–1994.

Figures and tables

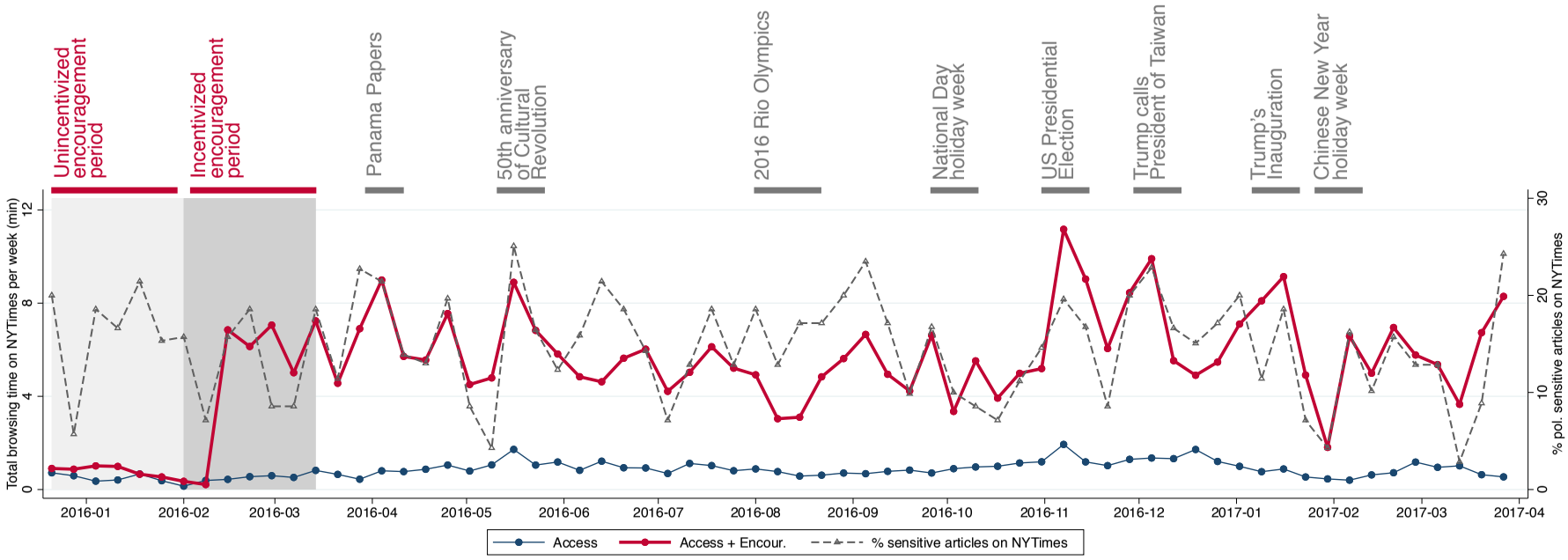


Figure 1: Average total browsing time (minutes) on the *New York Times* per week, among students received only the access treatment (*Group-A*) and those who received both access and encouregement treatments (*Group-AE*). *New York Times* browsing time includes both its English and Chinese websites. 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.

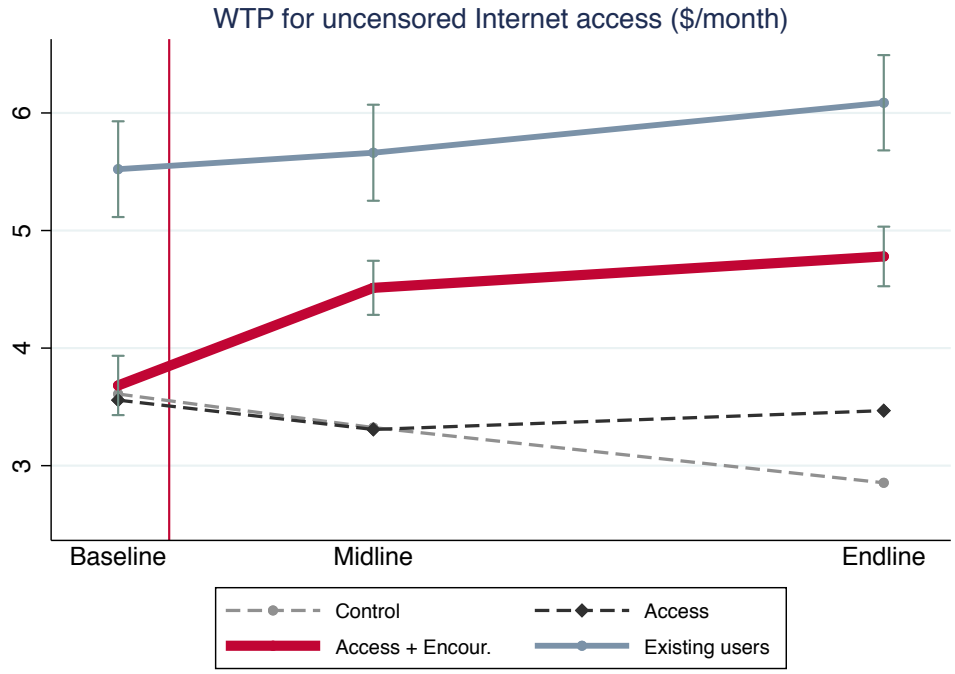


Figure 2: Average level of willingness to pay for accessing censorship circumvention tools (US$ per month), elicted using a BDM method, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouregement 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.

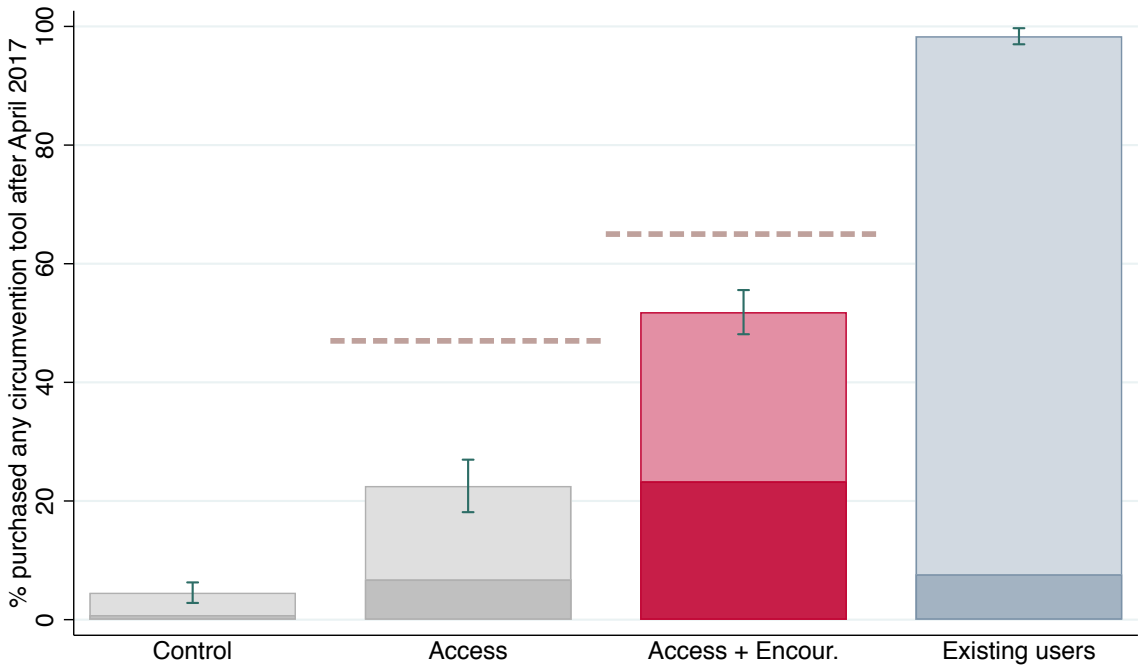
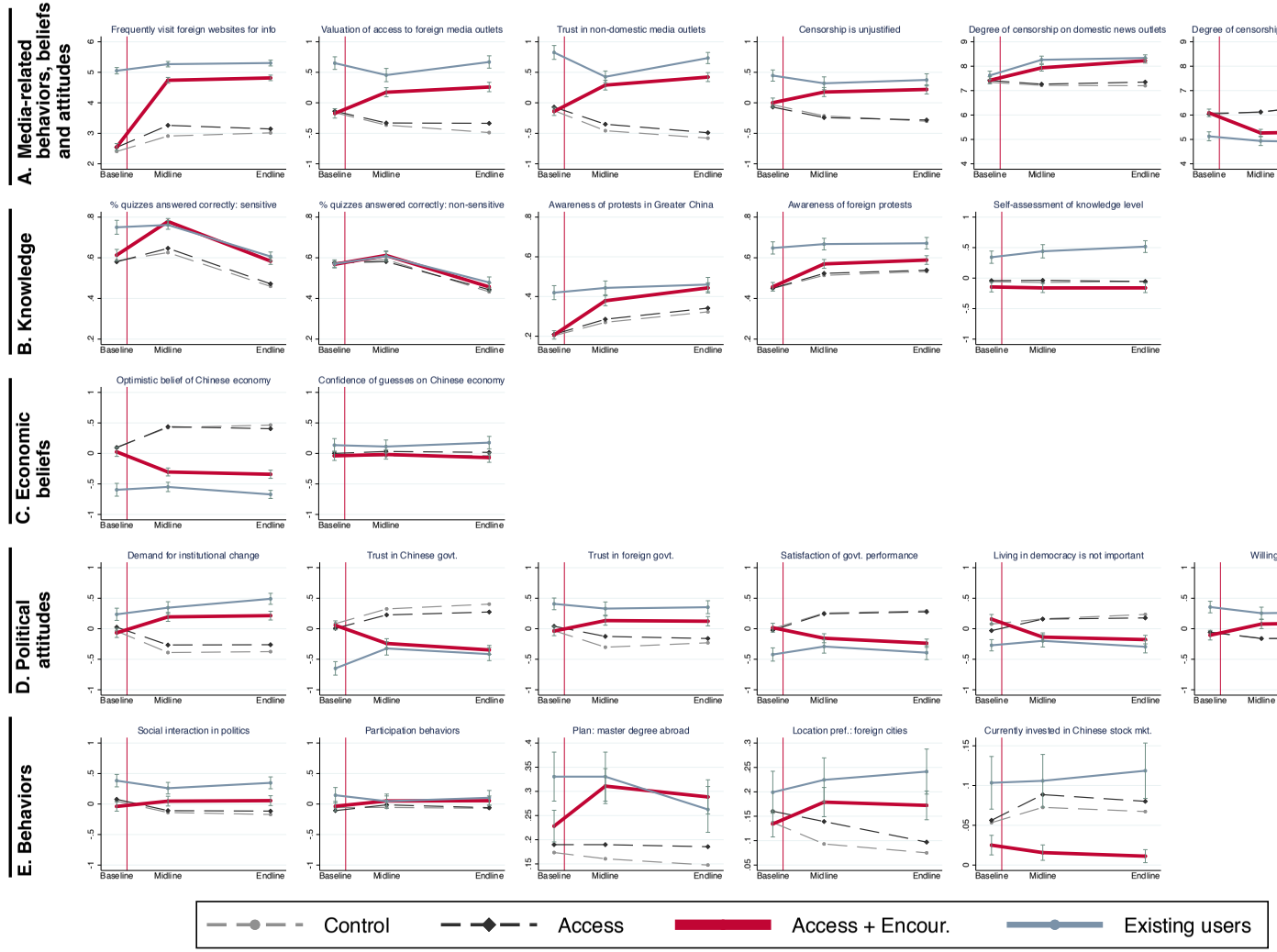


Figure 3: Percentage of students who indicated that they would purchase a censorship circumvention tool at the time of endline survey (April 2017), among students in control group (*Group-C*, pooling *C* and *CE* students together), those who receive only the access treatment (*Group-A*), those who receive both access and encouregement 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.



	Compared to Group-C	
	Group-A	Group-AE
A. Media-related behaviors, beliefs and attitudes	0.133 [0.067] **	1.186 [0.050] ***
B. Knowledge	0.075 [0.082]	0.368 [0.064] ***
C. Economic beliefs	0.093 [0.080]	0.531 [0.066] ***
D. Political attitudes	0.129 [0.073] *	0.818 [0.059] ***
E. Behaviors	0.108 [0.077]	0.259 [0.062] ***

Figure 4: 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 of outcomes, results are shown using a z-score index aggregating all questions. Table shows comparisons of means of *Group-A* and *Group-AE* students, relative to that of *Group-C* students, across a z-score index aggregating all outcomes from a particular category. Robust standard errors are shown. 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.

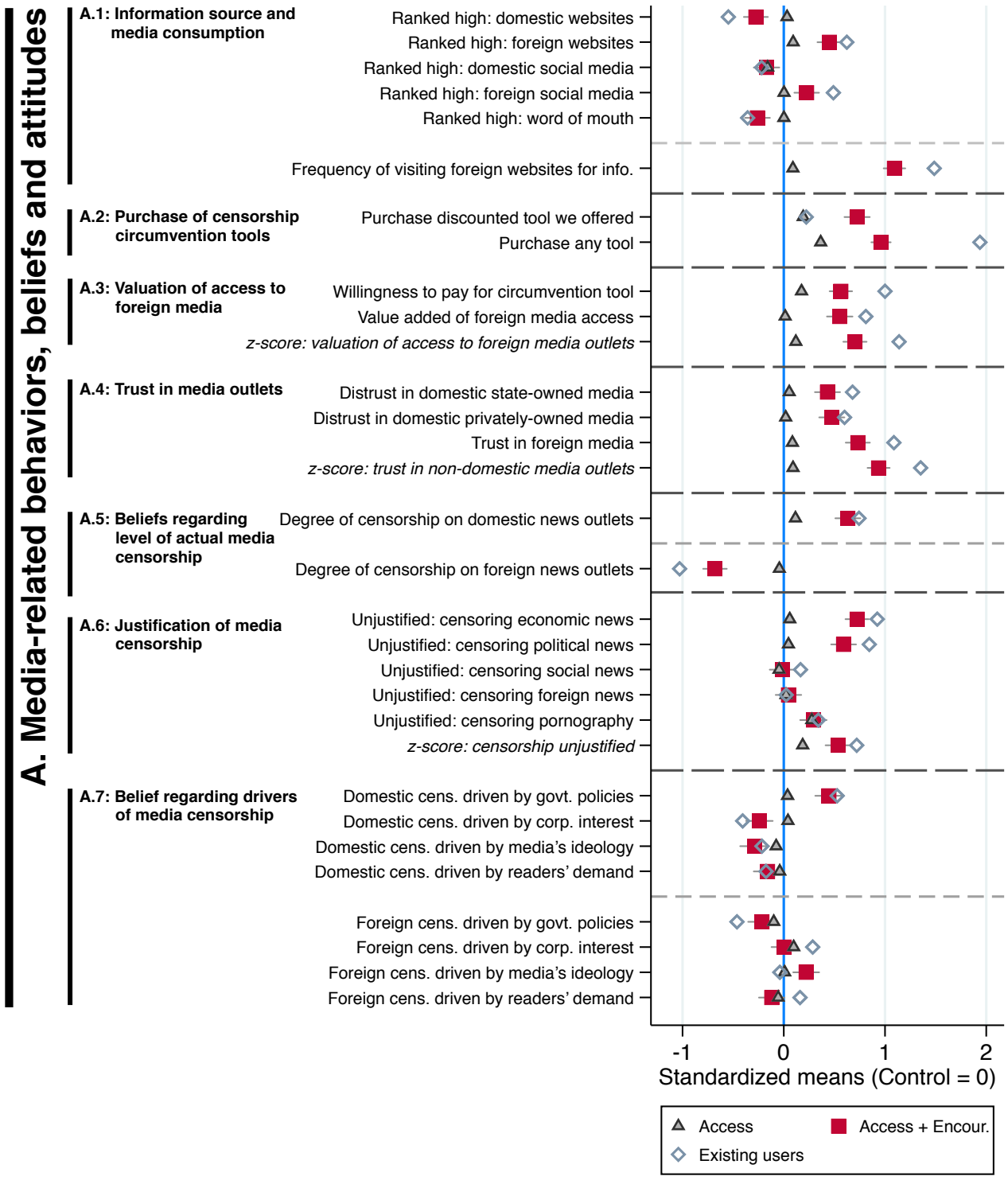


Figure 5: Comparison of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouregement treatments (*Group-AE*) and the existing 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.

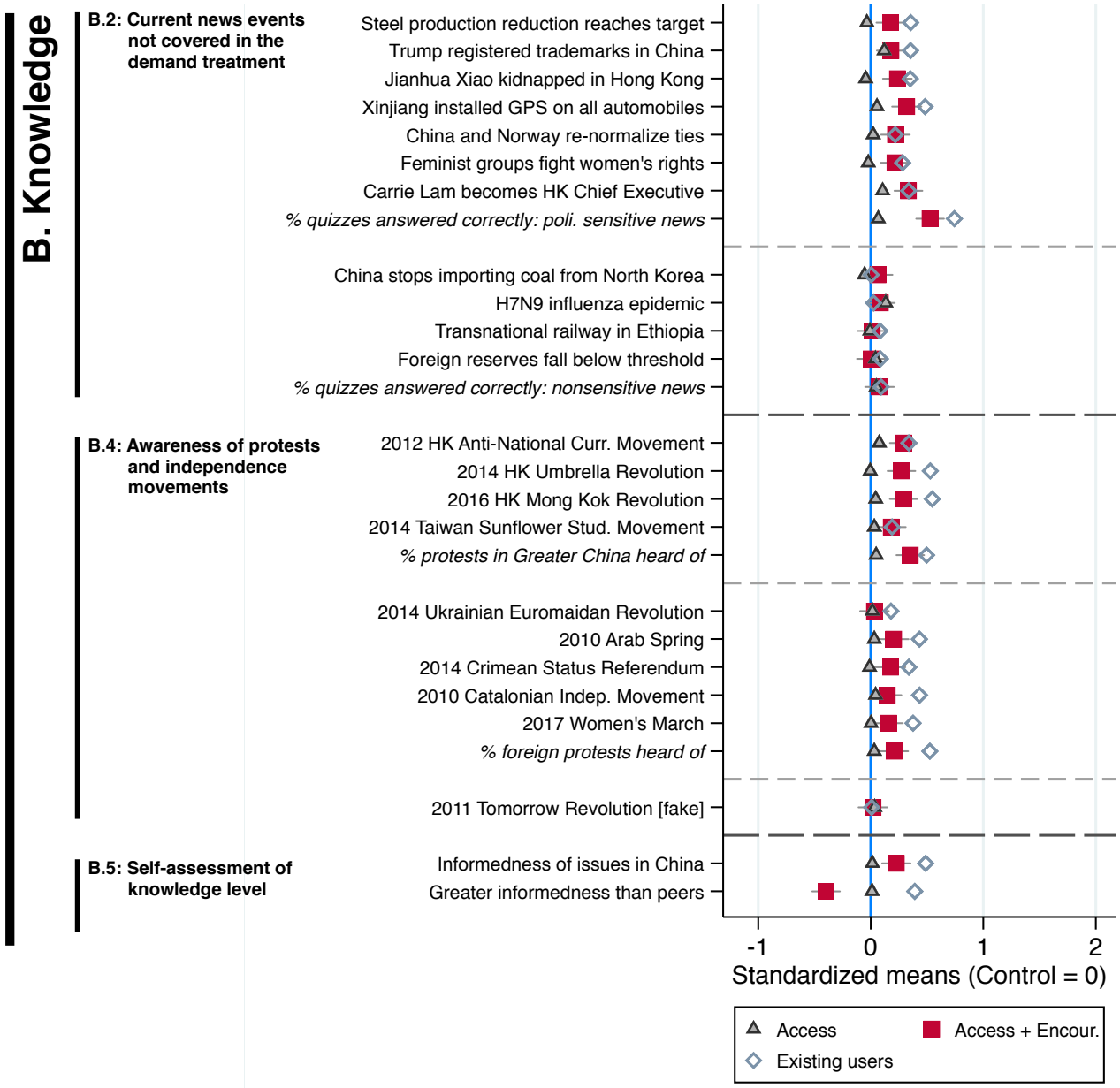


Figure 6: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) 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.

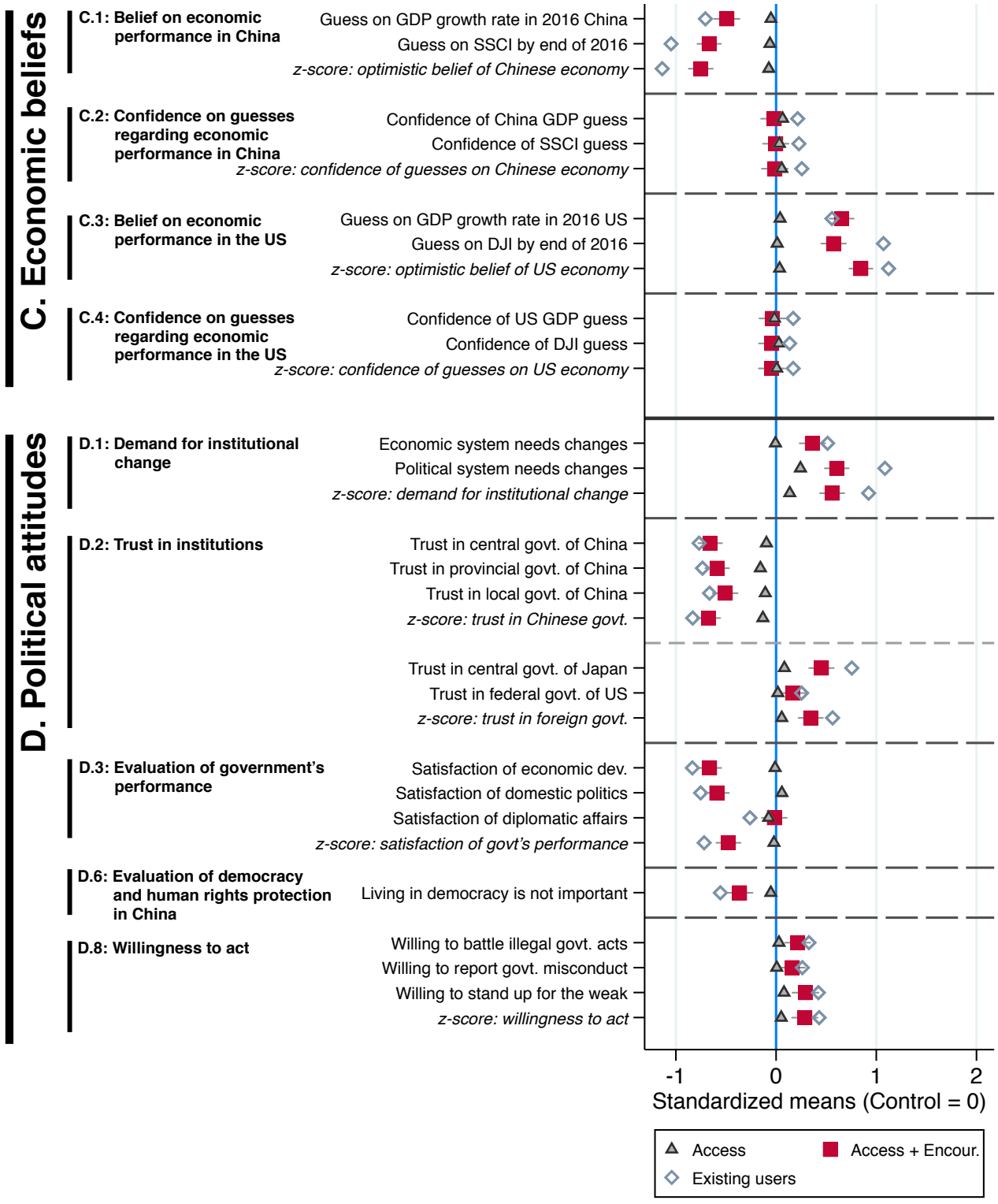


Figure 7: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) 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.

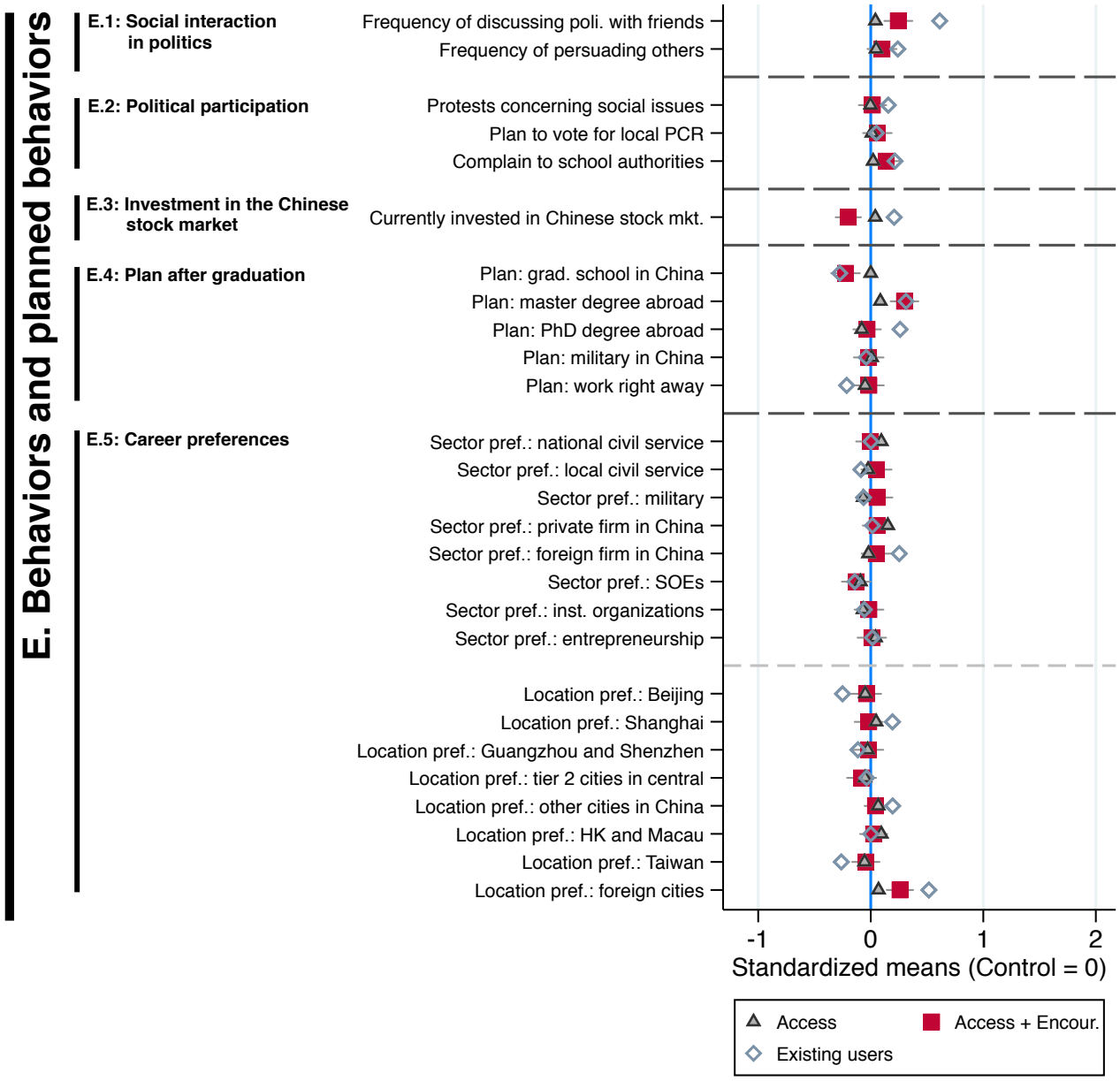


Figure 8: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*, pooling *C* and *CE* students together), those who received only the access treatment (*Group-A*), those who received both access and encouragement treatments (*Group-AE*) 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.

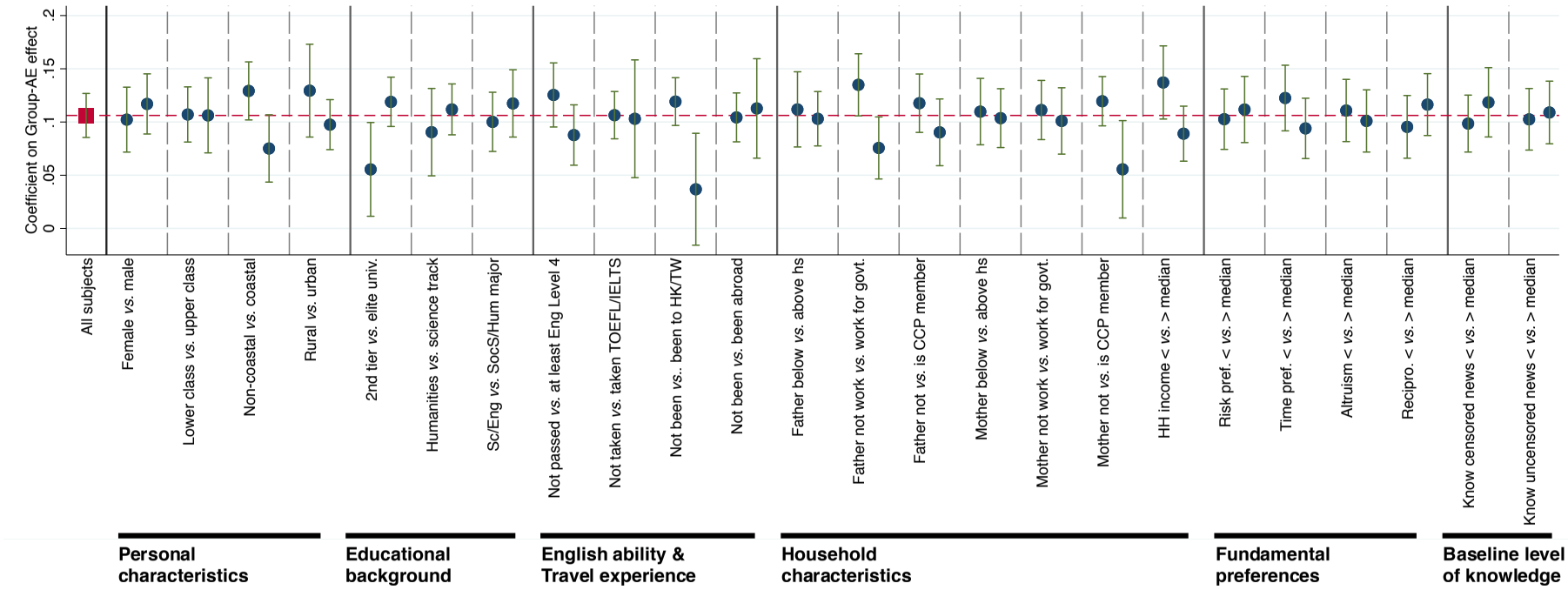


Figure 9: Treatment effect of access and encuragement treatments combined *(AE)* on the percentage of quizzes on politically sensitive news events students can answer correctly during endline survey, estimated on all subjects and various sub-samples, pooling students from the control *(C)*, control + 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.

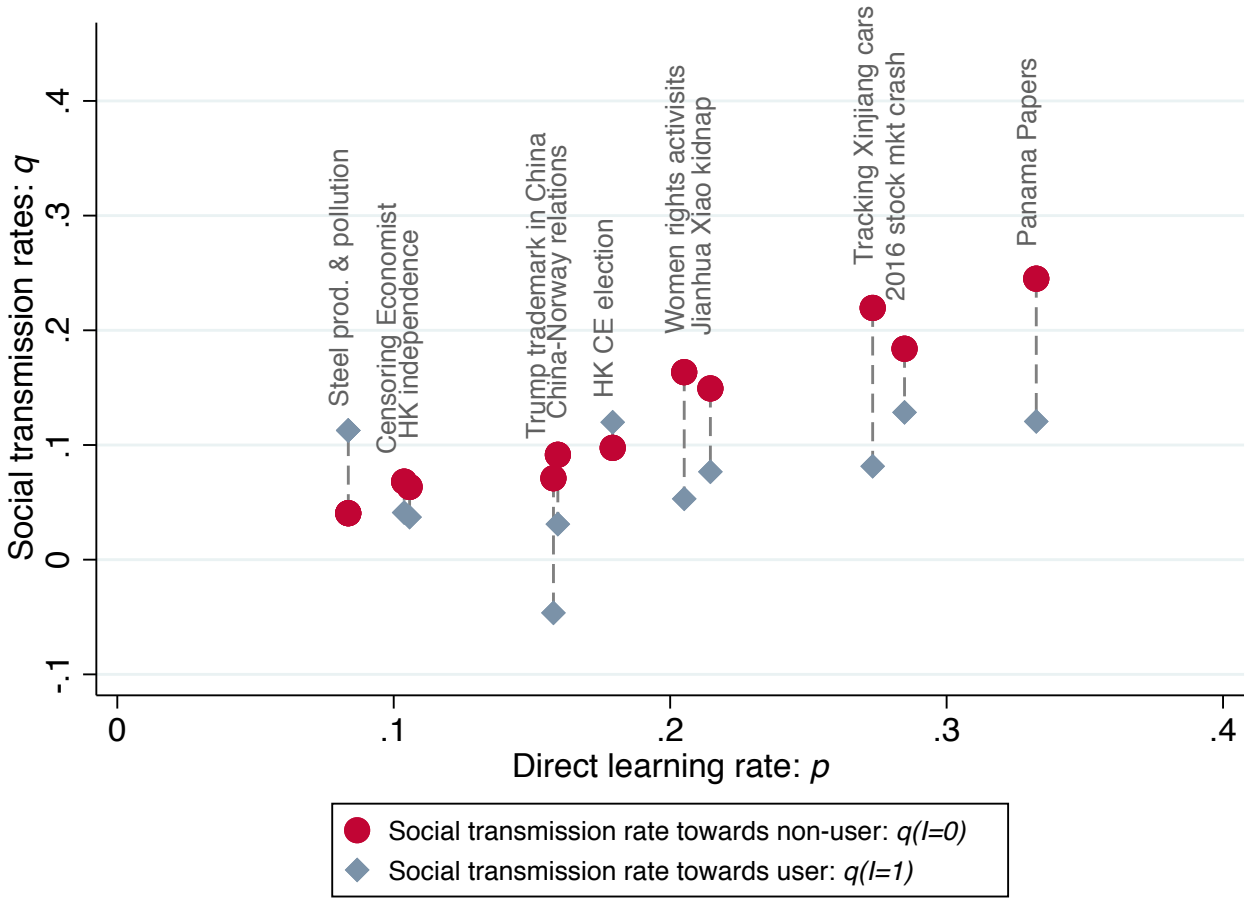


Figure 10: Estimated social transmission rates towards roommates who are not actively browsing foreign news websites themselves ($q(I = 0)$; red circle), and towards roommates who are actively browsing foreign news websites ($q(I = 1)$; blue diamond), across quizzes on 11 politically sensitive news events, 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.

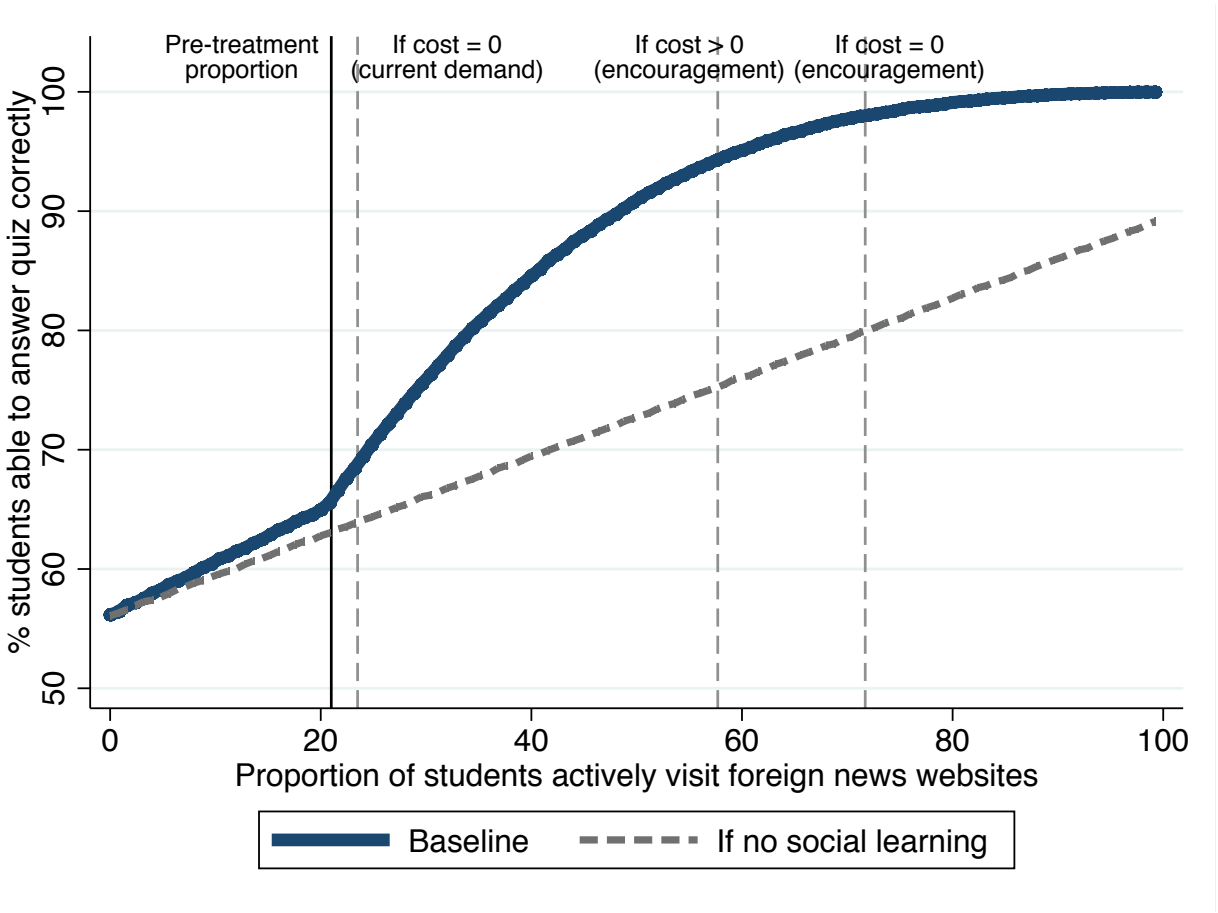


Figure 11: Simulation of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%. Details of the simulation procedure is described in Appendix H.

Table 1: 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	0.012	1.027	0.134	-0.142	0.023	-0.050	0.016	0.990	0.397
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	0.088	0.960	0.180	-0.021	0.280	0.011	0.010	5.190	0.001
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	0.028	1.020	0.064	-0.046	-0.039	0.099	0.032	1.018	0.384
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	0.034	1.022	0.278	-0.099	-0.093	0.014	0.028	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

Continued on next page

	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	0.034	0.949	0.064	-0.022	0.117	-0.024	0.019	1.127	0.337
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	12.16	10.84	11.83	12.08	10.68	3.921	0.008
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	-0.033	0.986	0.090	-0.046	-0.041	0.010	-0.109	0.824	0.481
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	0.035	0.981	0.094	0.021	0.013	-0.005	0.042	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	-0.010	0.999	-0.092	0.222	-0.021	-0.031	-0.017	2.335	0.072
# of obs.	1372		242	137	259	244	490	–	–

Notes: Sample contains students who have completed both baseline (November 2015) and endline (April 2017) surveys. ANOVA tests are conducted against the null hypothesis that corresponding characteristics of students in the control *(C)*, control + encouragement *(CE)*, access *(A)*, and access + encouragement *(AE)* groups are not different from each other.

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%	69.5%	46.1%	<0.001
Active users	46.7%	49.0%	64.6%	47.9%	<0.001
Regularly browsing *New York Times*	1.0%	9.8%	46.9%	49.9%	<0.001
Panel B: *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 encouregement treatments (*Group-AE*). They are divided into 3 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); *(ii)* "active users" — students who have activated the tool and were actively using the tool (used the tool at least 25 times since activation); and *(iii)* "regularly browsing the *New York Times*" (at least two days per week on average throughout the experiment). Panel B shows the average daily browsing time in total and on various categories of websites throughout the experiment, 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 3 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: Estimation of social learning model

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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: *Estimation of key parameters*											
p_j [rate of direct learning]	0.084	0.104	0.106	0.158	0.159	0.179	0.205	0.215	0.273	0.285	0.332
	[0.046]	[0.059]	[0.059]	[0.060]	[0.060]	[0.061]	[0.064]	[0.055]	[0.058]	[0.049]	[0.040]
$q_{j,I_i=0}$ [rate of social transmission, $I_i = 0$]	0.041	0.068	0.063	0.071	0.092	0.098	0.163	0.149	0.220	0.184	0.245
	[0.206]	[0.107]	[0.105]	[0.151]	[0.086]	[0.149]	[0.116]	[0.071]	[0.078]	[0.061]	[0.046]
$q_{j,I_i=1}$ [rate of social transmission, $I_i = 1$]	0.113	0.041	0.037	-0.046	0.031	0.120	0.053	0.077	0.081	0.128	0.121
	[0.172]	[0.087]	[0.085]	[0.117]	[0.069]	[0.124]	[0.094]	[0.058]	[0.063]	[0.052]	[0.038]
α_j [base rate knowledge]	0.186	0.450	0.460	0.244	0.547	0.233	0.349	0.570	0.477	0.520	0.560
	[0.046]	[0.050]	[0.050]	[0.051]	[0.051]	[0.051]	[0.053]	[0.046]	[0.048]	[0.041]	[0.034]
Panel B: *Predictions and out-of-sample tests*											
Predicted: % correct [$I_i = 0$, $N_i = 2$]	0.208	0.524	0.531	0.300	0.672	0.311	0.522	0.790	0.779	0.794	0.950
Actual: % correct [$I_i = 0$, $N_i = 2$]	0.190	0.514	0.548	0.365	0.706	0.333	0.540	0.802	0.762	0.808	0.918
Predicted: % correct [$I_i = 1$, $N_i = 2$]	0.329	0.599	0.607	0.364	0.749	0.508	0.612	0.901	0.868	1.000	1.000
Actual: % correct [$I_i = 1$, $N_i = 2$]	0.319	0.594	0.604	0.457	0.787	0.500	0.670	0.915	0.894	0.981	1.000

Notes: $I_i(own)$ indicates whether 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*). $N_i(roommate)$ indicates the number of college dorm roommates who are actively use censorship circumvention tool as a result of the experimental treatment. 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, and have either 0 or 1 roommates who are actively use censorship circumvention tool as a result of the experimental treatment.

ONLINE APPENDIX, NOT FOR PUBLICATION

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 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 equip-

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

ment 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 cases of citizens, often high profiled celebrities and journalists, arrested 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 that citizens get arrested because they consume contents on the websites blocked by the Great Firewall. Roberts (2016) argues that this is because imposing fear and deterrence among citizens themselves could often lead to backlashes. Roberts (2016) documents that there is little perceived fear among Chinese citizens in terms of browsing politically sensitive information online:

> [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 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

[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.

topics that are viewed by the state as more sensitive, as they are alerted to topics the Chinese government deems dangerous.

In addition, the usage censorship circumvention tools do not seem to carry a particular stigma or fear. For example, Hobbs and Roberts (2016) 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] Appendix Figure A.3 shows a screenshot of this type of newsletter.

[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*		

Continued on next page

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))

Continued on next page

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.2.1-18		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)

Continued on next page

[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	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.2.2	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.2.3	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.2.4	M	Since April 2016, the English magazine "Economist" terminates its publication and distribution in China due to loss of profit. *[censored]*
B.2.5	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.2.6	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.2.7	E	Jianhua Xiao, a billionaire residing in Hong Kong was kidnapped by local gangs during the 2017 Chinese New Year. *[censored]*
B.2.8	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.2.9	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.2.10	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.2.11	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.2.12	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.2.13	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.2.14	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.2.15	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.2.16	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.2.17	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.2.18	E	The foreign reserves held by China reached record high in the beginning of 2017, which grew beyond the US$ 4 trillion threshold. *[uncensored]*
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

Continued on next page

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)*].
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 subcategories, 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*		
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*		

Continued on next page

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)
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

Continued on next page

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.

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

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
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

Continued on next page

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.

[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.

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)
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?)

Continued on next page

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, 1,618 participants complete the follow-up survey, implying a panel retention rate of 90.4%. Appendix Table A.8 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 beliefs regarding media

We compare the average level of these 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.16, Panel A, where we also provide summary statistics across various groups of students.

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: 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.2)*; 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.3)*; 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.4 and 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)*; and 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)*. 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 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.16, 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,[15] comparing to Group-N, Group-NE, and Group-A students, who are statistically indistinguishable from each other.[16]

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.13, 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.[17]

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*).[18] As two placebo tests, we show that exposure induces increase in knowledge on neither figures who are

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

[16]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.

[17]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.

[18]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.)

politically nonsensitive, nor a fake name that we created ("Lequn Jia").[19] 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.[20]

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).[21] 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."[22]

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.[23] 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 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

[19] 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.

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

[21] 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).

[22] 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.

[23] 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.

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.[24]

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.[25]

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 willingness to report government's misconduct) *(Category D.8)*; and more interested in political and economic issues in general *(Category D.9)*.[26] We find that exposure does not lead Group-AE students to hold a weaker

[24]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.

[25]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.

[26]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)

national identity, as measured by students' pride in being Chinese *(Category D.10)*.

Importantly, we find that exposure to uncensored information has made students slightly more fearful of expressing critical attitudes toward the government *(Category D.11)*, presumably because they are now informed of many political persecution cases and pressure that the government is exerting on political dissidents. It is worth highlighting that the average level of self-reported fear among our study participants is of scale 5.0, indicating "so-so" or only a slight level of fear, which is consistent with our list experiment results as described in Section 3. The marginally increase in fear induced by exposure suggests that the impact on other sensitive political attitudes is likely to be underestimated.

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. Echoing Group-AE students' increased consumption of foreign media and updated beliefs regarding media, we find that they 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 E.1)*.[27]

Moving beyond behaviors concerning media consumption, we find that exposure has made students: more likely to engage with other students to discuss political topics *(Category E.2)*; 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)*.

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

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.8, 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 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 11, 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.14, 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.15, 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.

In Appendix Figure A.16, 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).

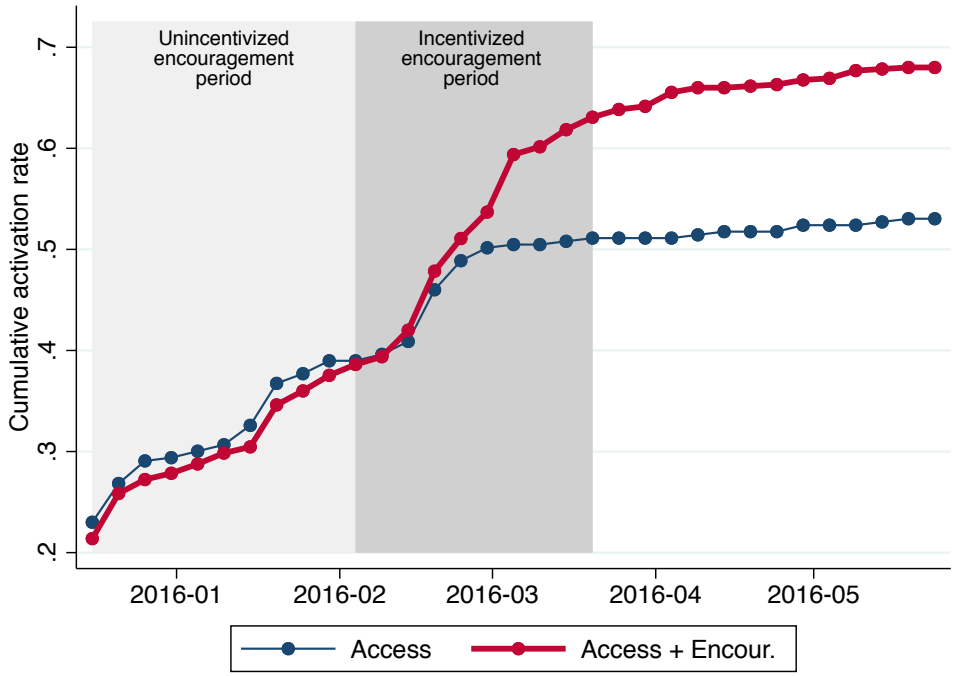


Figure A.4: Cumulative rate of activating censorship circumvention tool over time, among students who received only the access treatment (*Group-A*) and those who received both access and encoruagement treatments (*Group-AE*). Activation is an indicator equals 1 if students install the tool and use it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

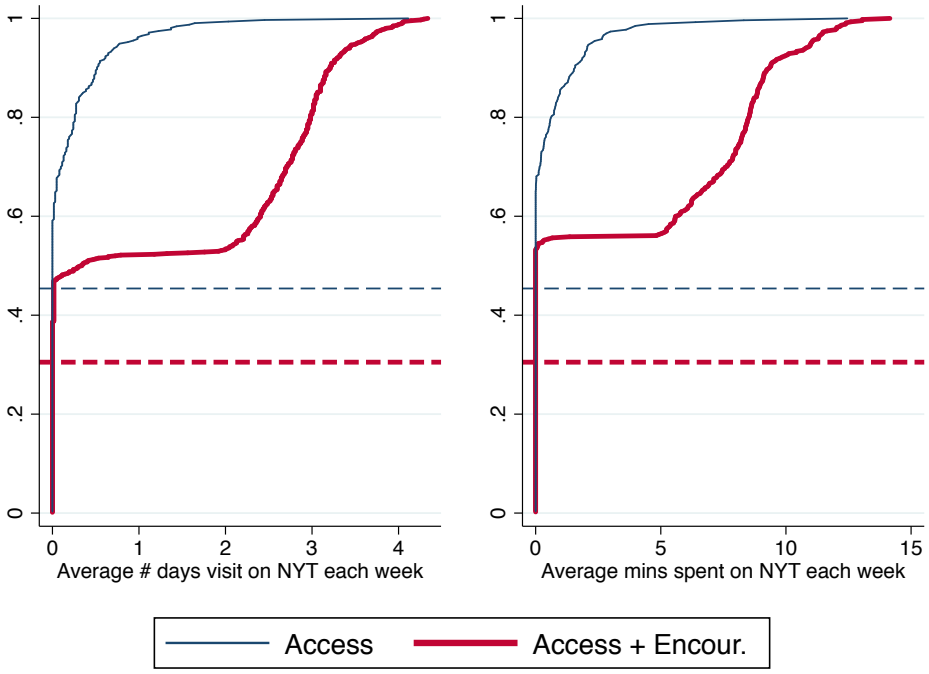


Figure A.5: Cumulative distribution plot of the average total number of days visiting the *New York Times* website (including both the English and Chinese edition) in a given week (left panel), and the average total browsing time on the *New York Times* website (right panel), among all students in the 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.

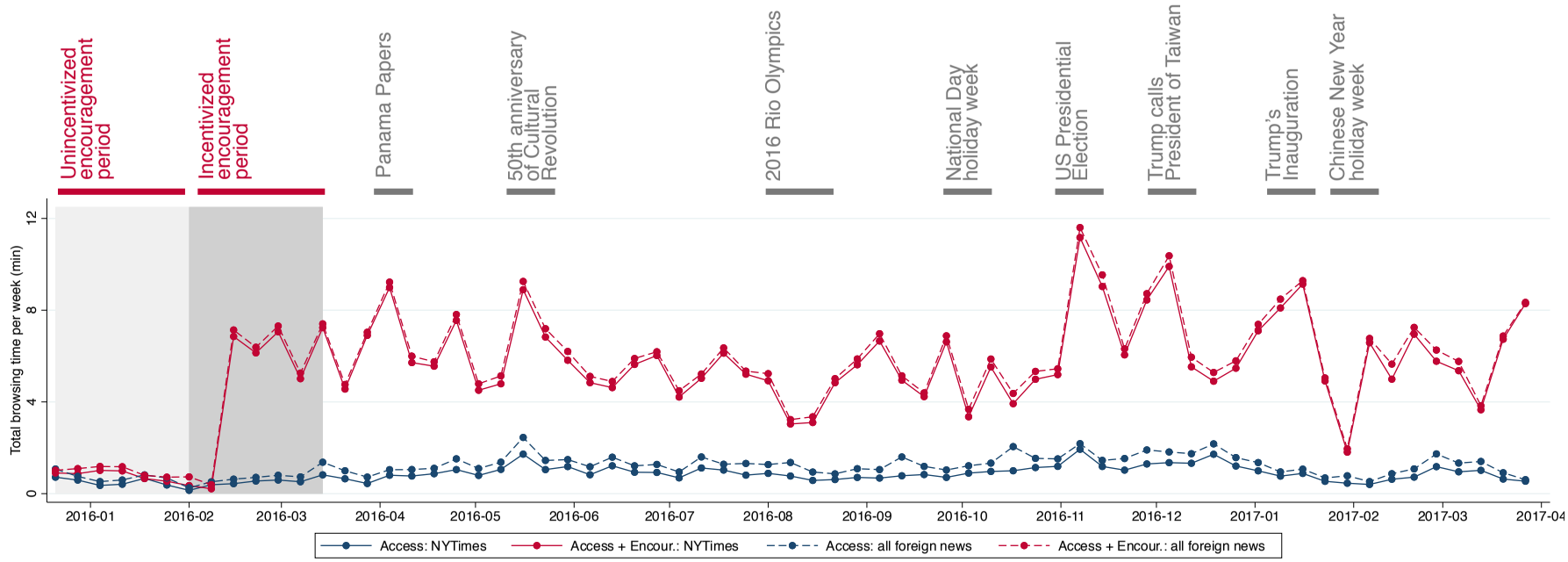


Figure A.6: Average total browsing time (minutes) on the *New York Times* and all top foreign news websites per week, among students received only the access treatment (*Group-A*) and those who received both access and encouregement treatments (*Group-AE*). *New York Times* browsing time includes both 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.

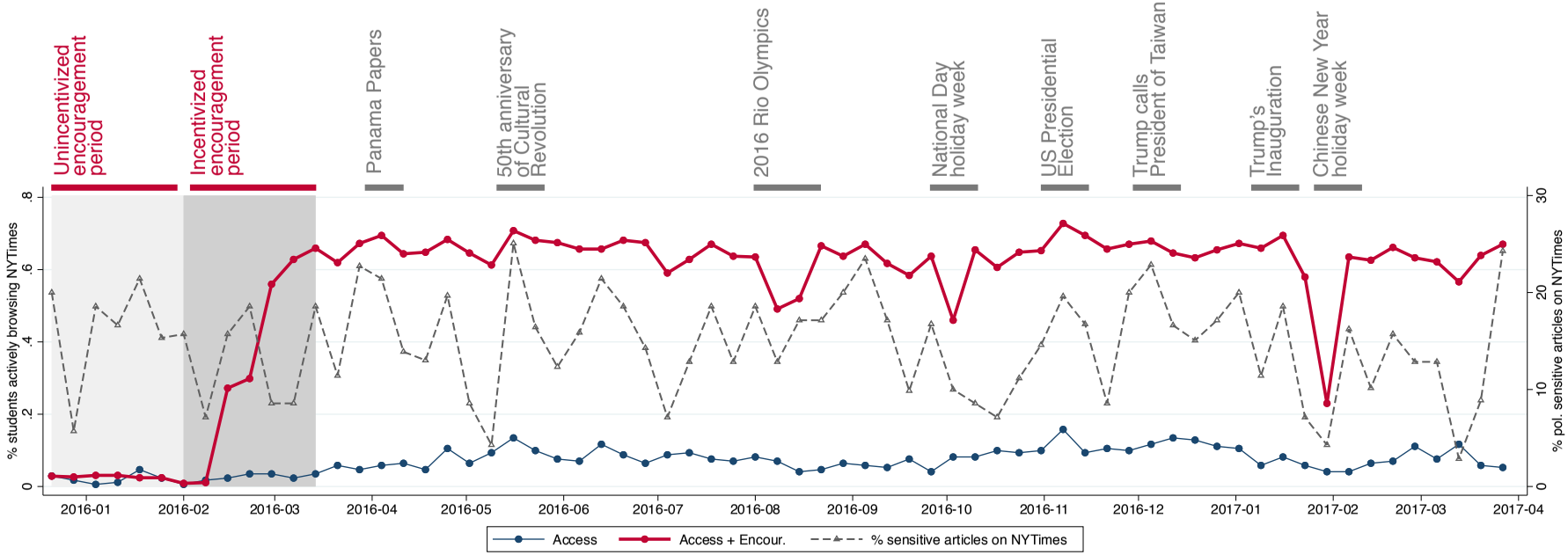


Figure A.7: Average proportion of students actively browsing the *New York Times* website (including both its English and Chinese edition) per week, among students received only the access treatment (*Group-A*) and those who received both access and encouregement treatments (*Group-AE*). A student actively 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.

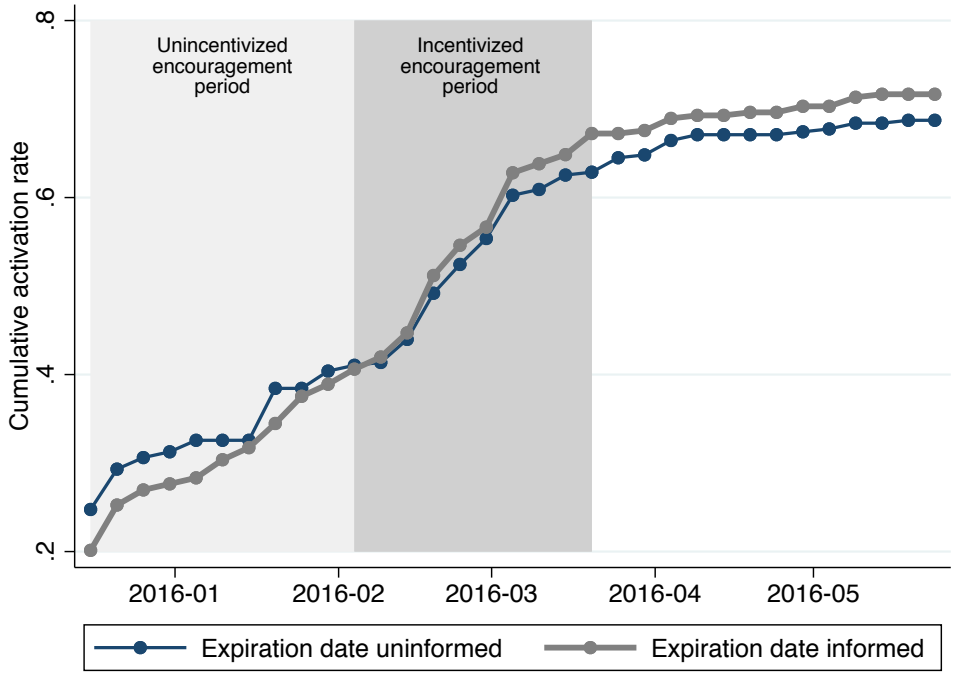


Figure A.8: Cumulative rate of activating censorship circumvention tool over time, among students who are randomly assigned with an explicitly mentioned deadline for their free subscription of censorship circumvention tool, and those to whom we did not explicitly mention the deadline. Activation is an indicator equals 1 if students install the tool and use it at least once.

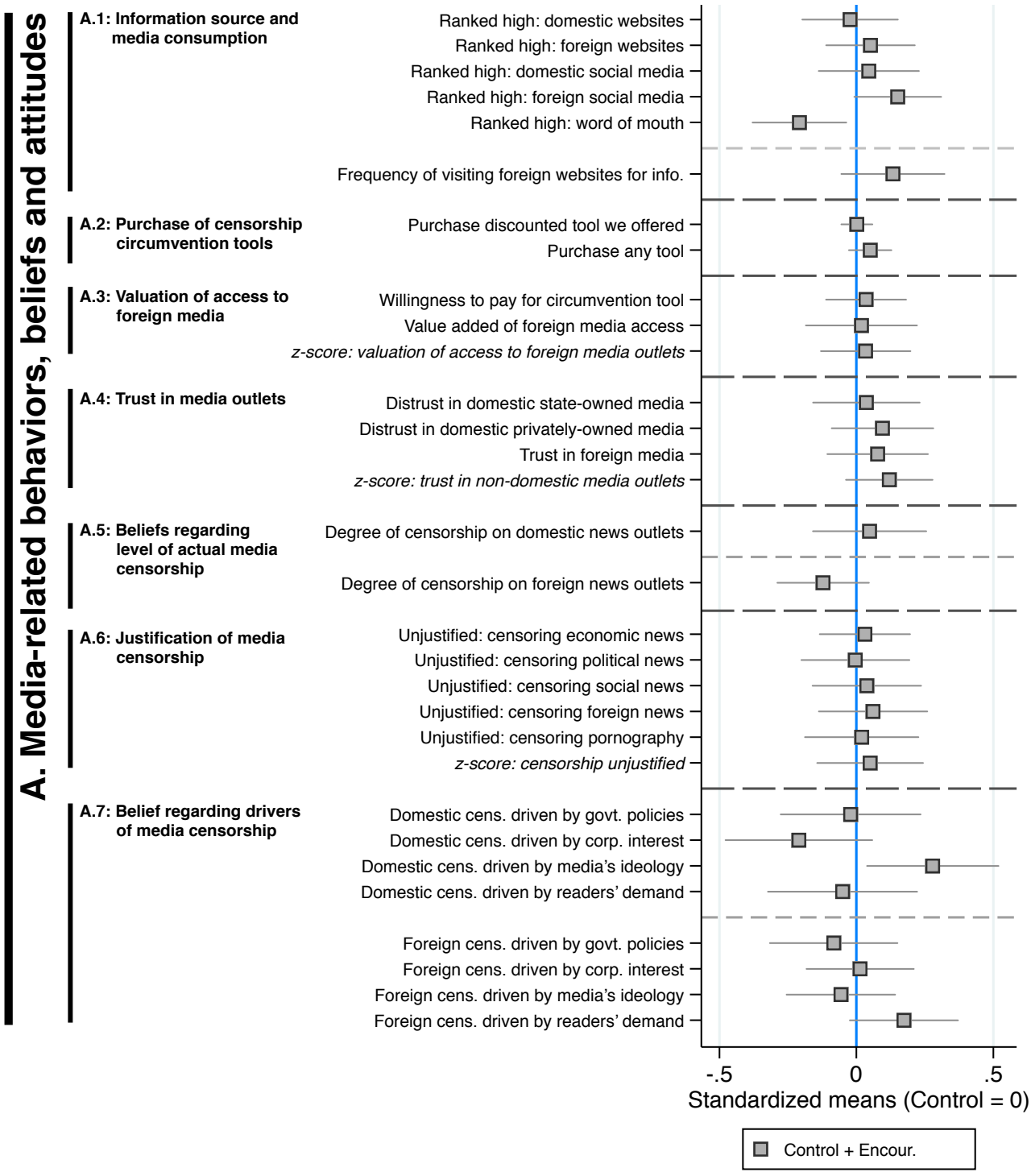


Figure A.9: Comparison of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

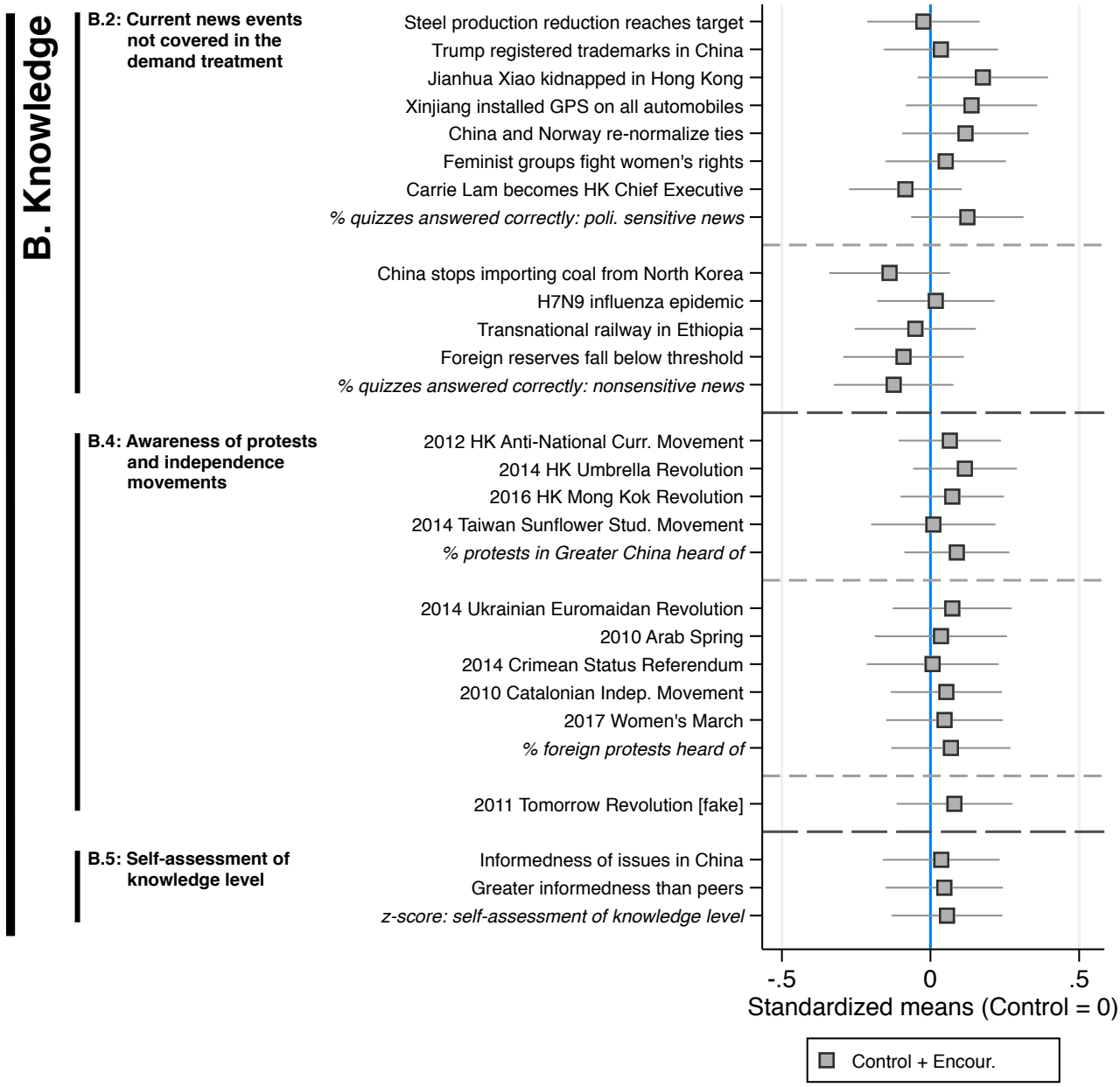


Figure A.10: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence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

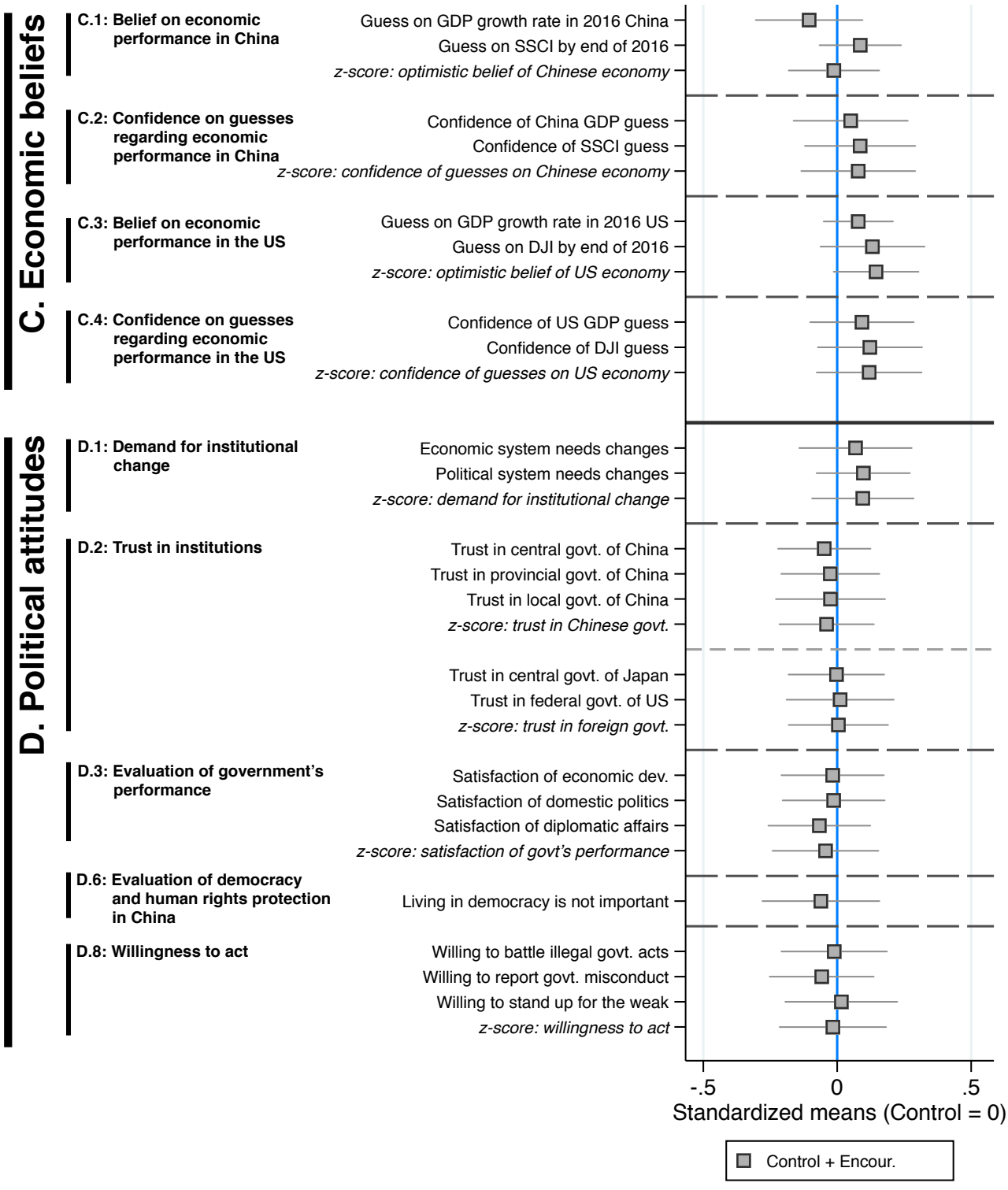


Figure A.11: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

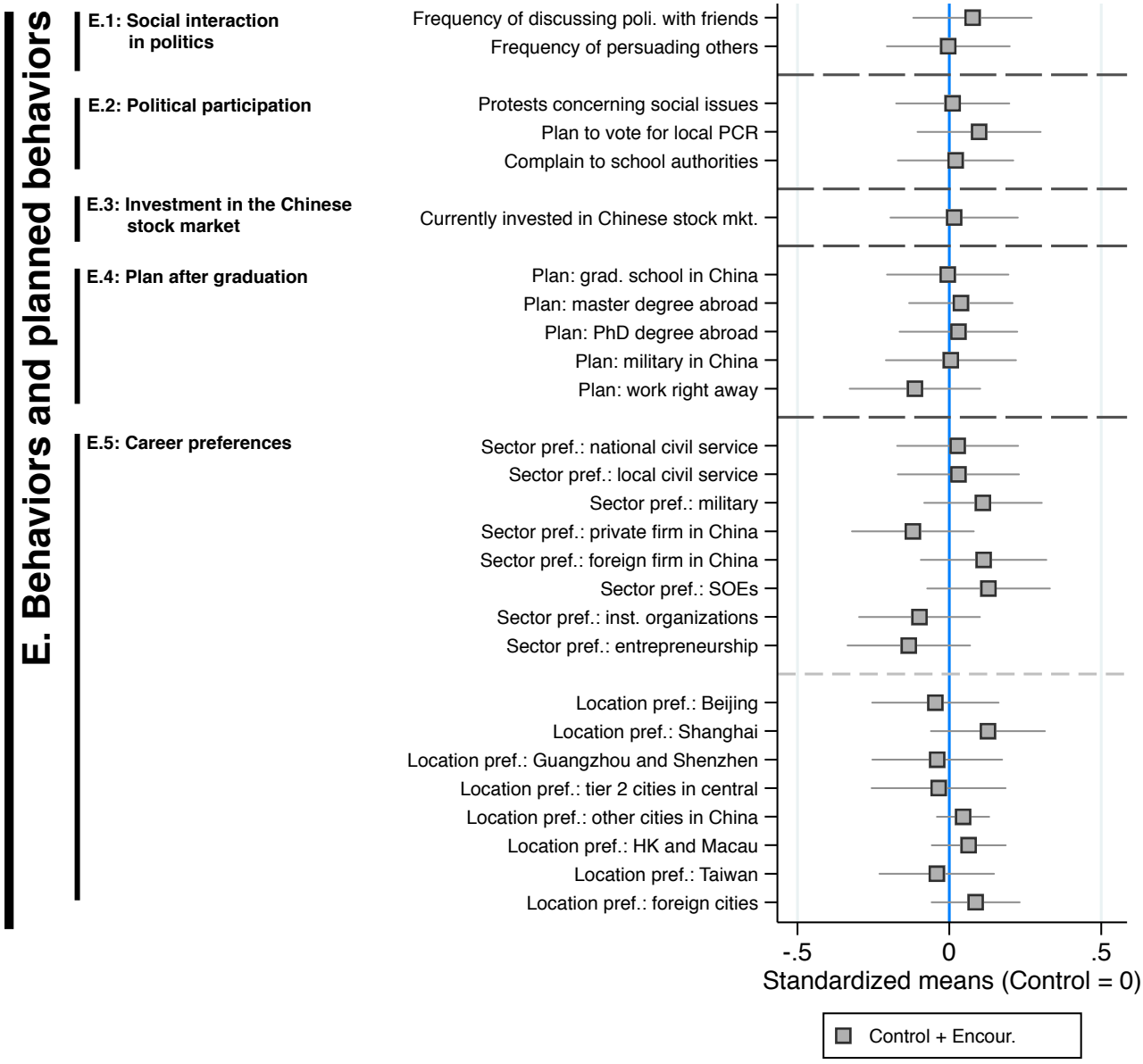


Figure A.12: Comparison (continued) of (standardized) means in endline survey outcomes, among students in control group (*Group-C*) and hose who received only the encouragement treatment (*Group-CE*). The mean level among *Group-C* students is normalized as 0. Figure also shows 95 percent confidence intervals calculated using robust standard error for *Group-CE* students. Sample is restricted to 396 students who have completed the endline survey.

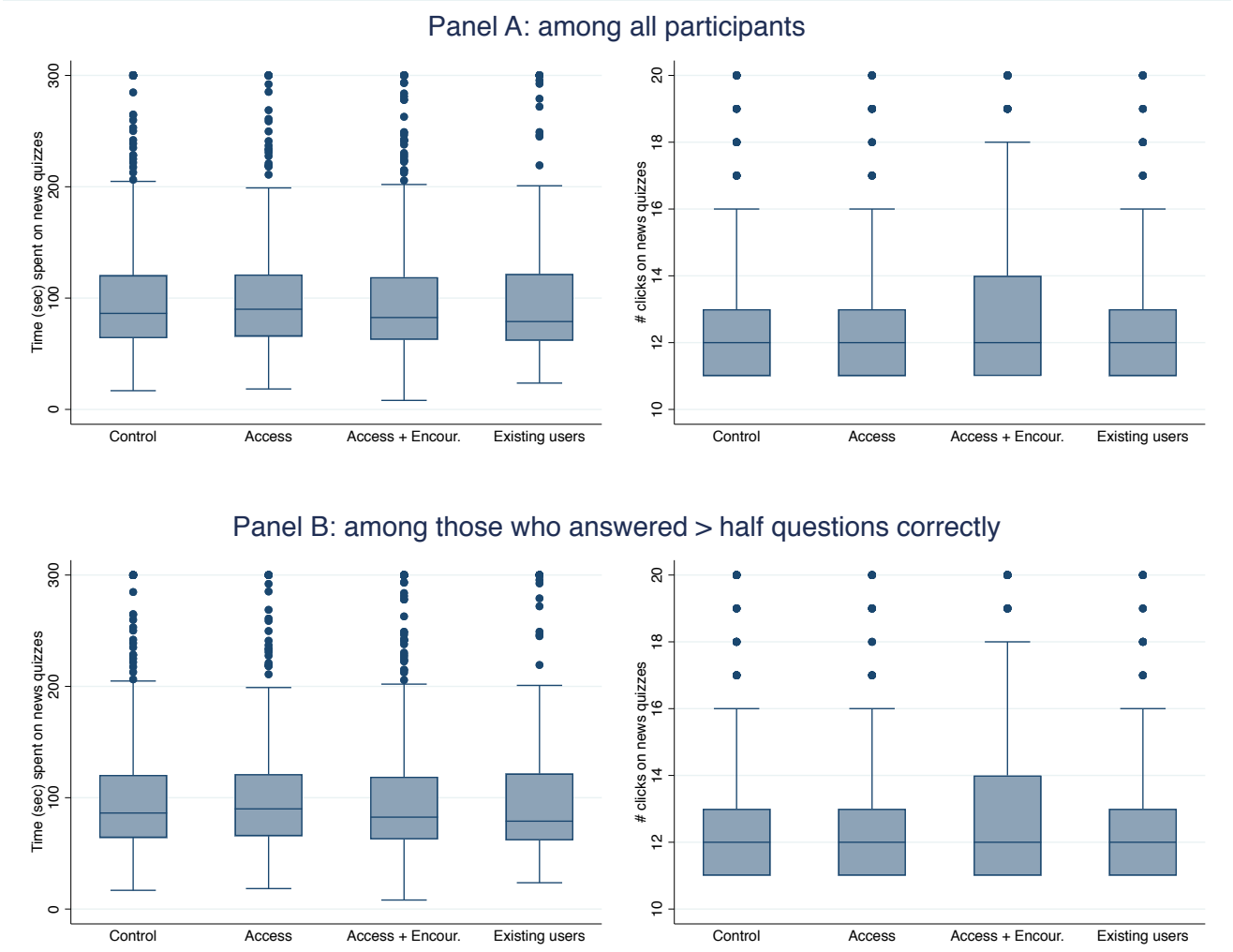


Figure A.13: Time spent during midline survey (May 2016) modules on news quizzes, as well as the total number of clicks recorded during the survey prior to submission, across students in the control *(C)*, access *(A)* and access + encouragement *(AE)* groups, and existing users. Panel A shows results among all 1,618 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.

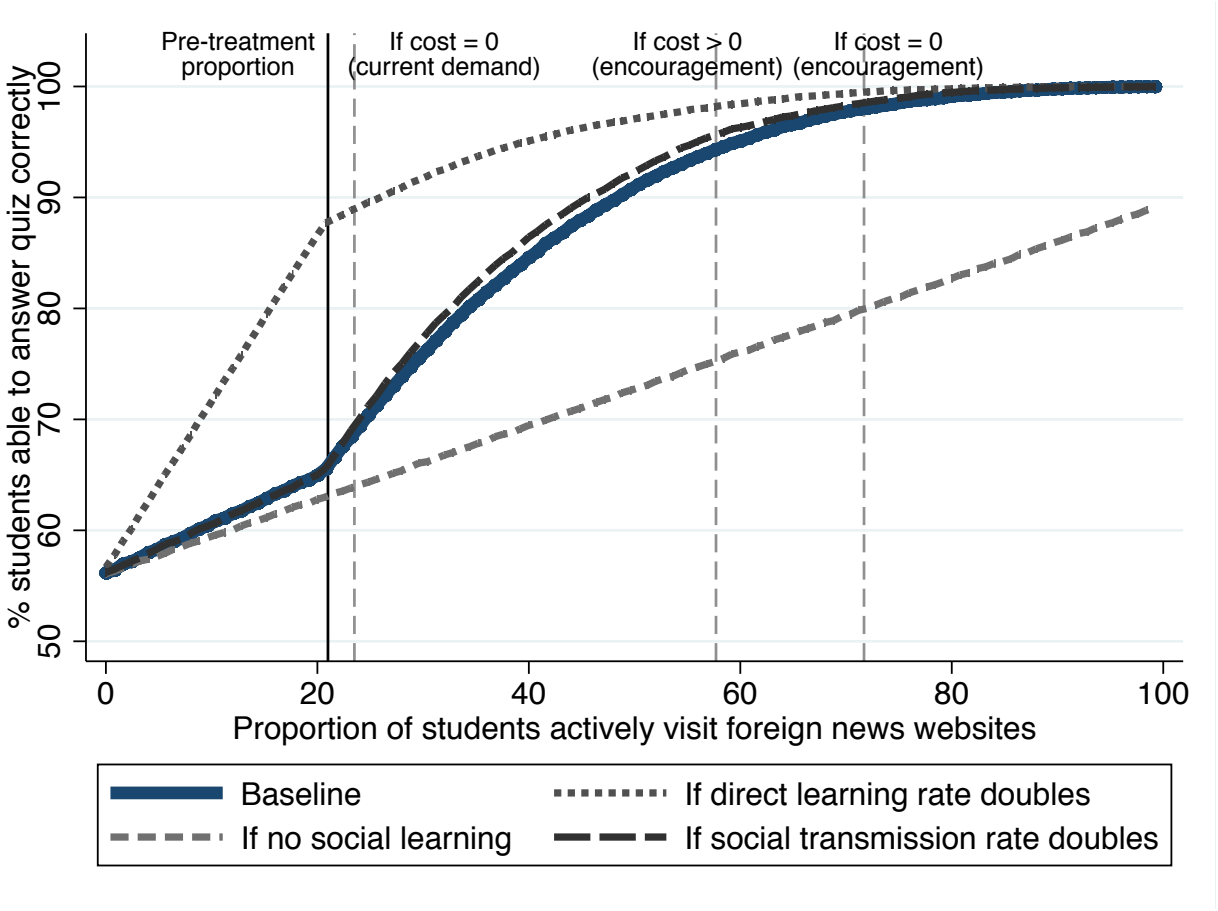


Figure A.14: Simulation of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%, with a set of alternative specifications related to the model parameters on direct learning and social transmission of information. Details of the simulation procedure is described in Appendix H.

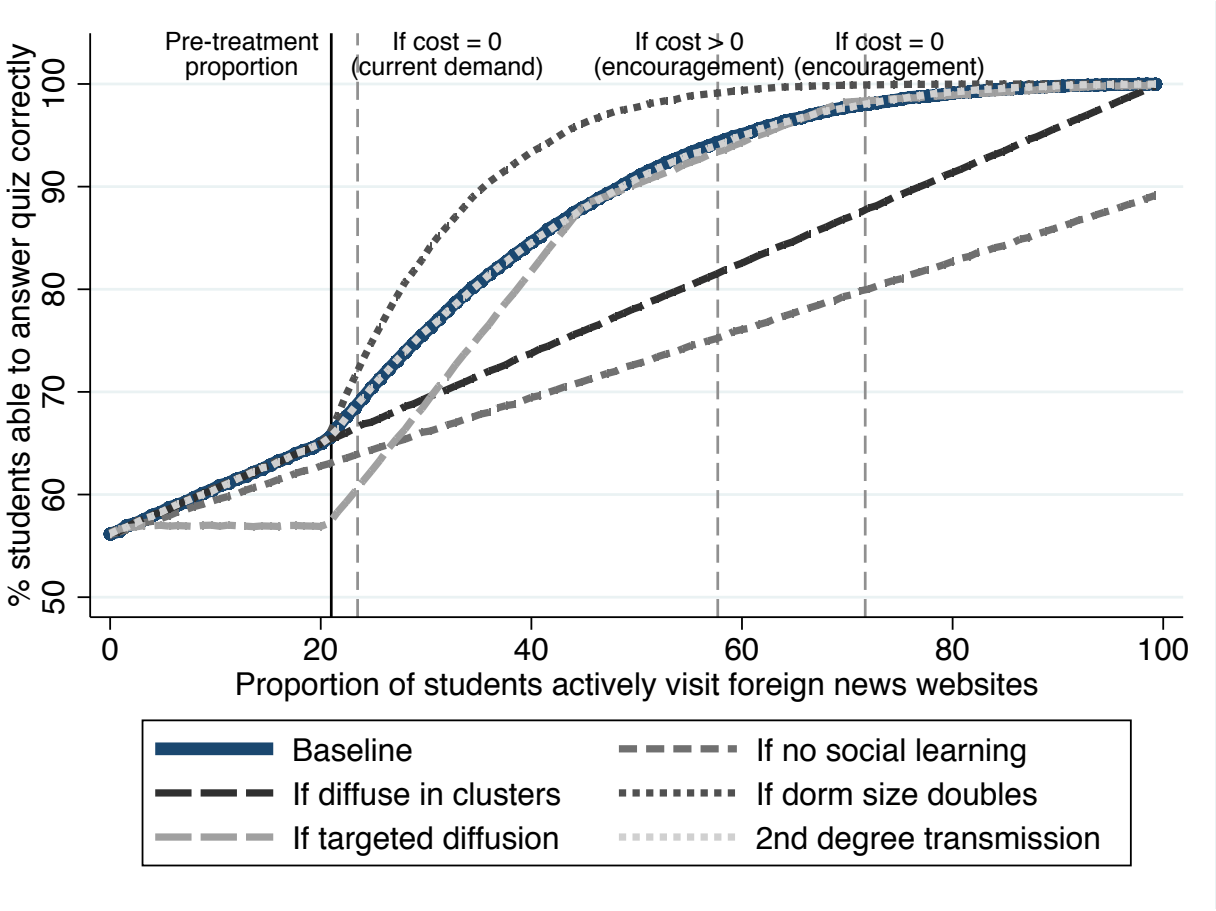


Figure A.15: Simulation *(continued)* of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%, with a set of alternative specifications related to the diffusion process of the access tool and the underlying social learning environment. Details of the simulation procedure is described in Appendix H.

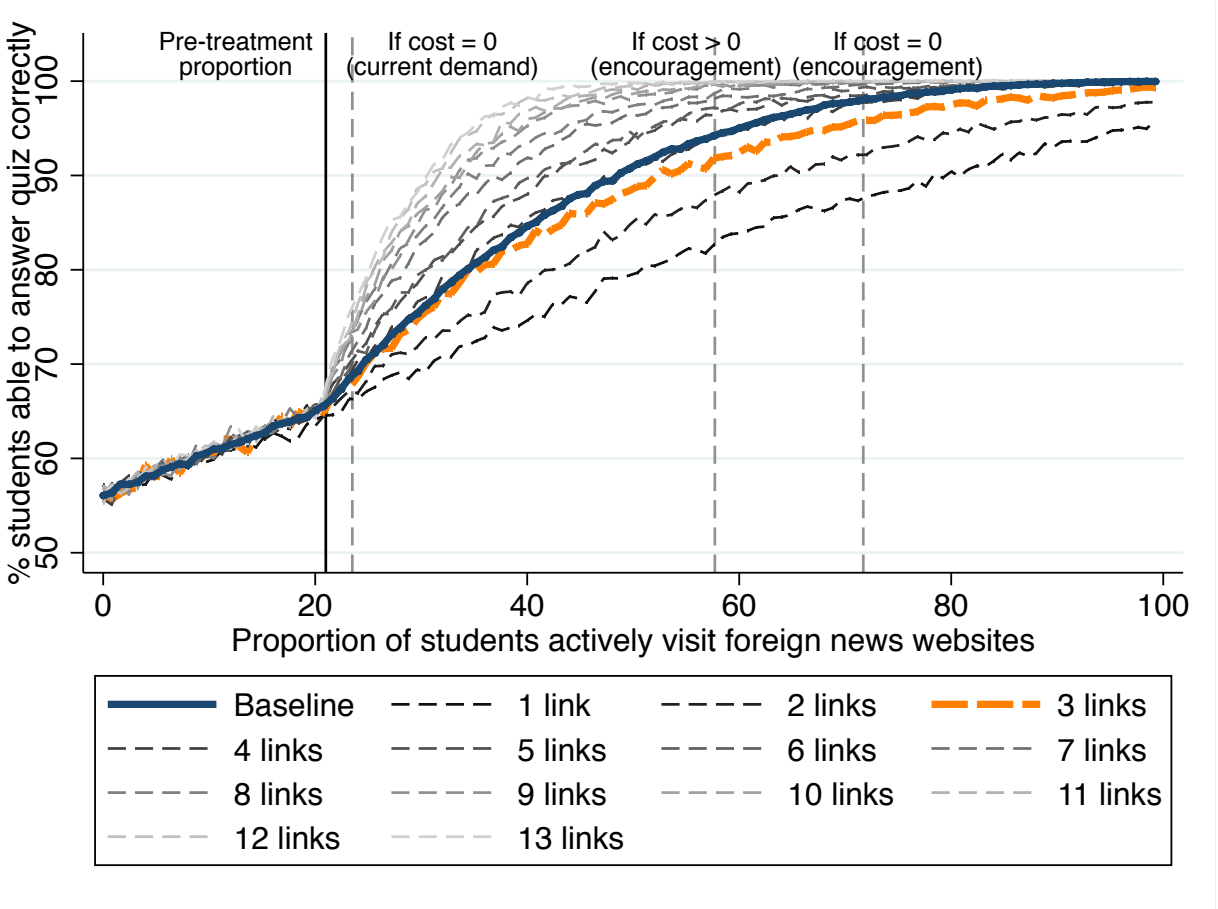


Figure A.16: Simulation *(continued)* of the proportion of students who can answer quiz on the Panama Papers correctly across the entire student population, as the proportion of students who actively visit foreign news websites grows from 0 to 100%, with a set of alternative spefications that incorporate the full conversation networks among the student population. Details of the simulation procedure is described in Appendix H.

Table A.7: 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	0.027	1.013	0.135	-0.114	0.026	-0.014	0.030	0.981	0.401
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	0.114	0.980	0.217	0.051	0.253	0.054	0.038	3.656	0.012
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	0.064	1.034	0.348	-0.065	-0.039	-0.023	0.050	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

Continued on next page

	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	0.052	0.981	0.087	0.023	0.090	0.010	0.043	0.384	0.765
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	5.962	11.94	10.58	11.73	11.90	11.02	2.875	0.035
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	-0.018	0.978	0.078	-0.081	-0.020	0.003	-0.059	0.423	0.737
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	0.038	0.986	0.134	-0.027	0.027	-0.027	0.046	0.523	0.666
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	-0.031	0.984	-0.105	0.014	0.048	-0.025	-0.049	0.757	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	-0.023	0.992	-0.107	0.137	-0.045	-0.033	-0.010	1.488	0.216
# 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.8: 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	0.560	0.496	0.602	0.522	0.589	0.579	0.524	1.571	0.195
Birth year	1995.8	1.261	1995.9	1995.9	1995.8	1995.7	1995.8	0.874	0.454
Height	170.0	9.406	170.8	168.6	170.1	170.3	169.8	1.186	0.314
Han ethnicity	0.910	0.287	0.925	0.894	0.895	0.913	0.912	0.392	0.759
Born in coastal province	0.412	0.492	0.441	0.412	0.377	0.450	0.396	1.204	0.307
Resided in coastal province	0.439	0.496	0.474	0.406	0.400	0.491	0.423	2.022	0.109
Urban hukou prior to college	0.782	0.413	0.856	0.753	0.757	0.720	0.796	2.130	0.095
Religious	0.069	0.253	0.046	0.059	0.089	0.080	0.068	0.665	0.574
Member of CCP *[at baseline]*	0.066	0.248	0.062	0.041	0.072	0.052	0.078	1.393	0.243
z-score: personal characteristics	0.024	1.023	0.129	-0.114	0.020	-0.030	0.038	1.001	0.391
Category 2: *Educational background*									
Elite university	0.835	0.371	0.971	0.835	0.774	0.803	0.810	0.983	0.400
Science track in high school	0.739	0.444	0.709	0.694	0.790	0.716	0.726	2.323	0.073
SoSc./Hum. major at college	0.448	0.497	0.468	0.470	0.468	0.437	0.426	0.643	0.588
z-score: educational background	0.117	0.976	0.226	0.066	0.241	0.032	0.048	3.004	0.029
Category 3: *English ability and oversea travel experiences [at baseline]*									
At least Level 4 certi. in English	0.512	0.500	0.526	0.488	0.482	0.519	0.524	0.590	0.621
Taken TOEFL or IELTS	0.130	0.336	0.180	0.100	0.121	0.128	0.117	0.282	0.839
z-score: English ability	0.048	1.039	0.166	-0.041	-0.006	0.054	0.037	0.433	0.729
Traveled to HK, Macau, Taiwan	0.182	0.386	0.281	0.135	0.154	0.159	0.170	0.411	0.745
Traveled to foreign countries	0.241	0.418	0.327	0.212	0.190	0.218	0.243	1.094	0.351
z-score: oversea travel experiences	0.049	1.026	0.336	-0.071	-0.072	-0.023	0.031	0.944	0.419
Category 4: *Household characteristics*									
Total # siblings	0.540	1.095	0.402	0.600	0.618	0.550	0.548	0.325	0.807
Father educ. above hs.	0.678	0.467	0.745	0.647	0.668	0.671	0.660	0.111	0.954
Father works related to govt.	0.486	0.500	0.510	0.482	0.495	0.464	0.482	0.197	0.898
Father member of CCP	0.427	0.495	0.418	0.376	0.452	0.377	0.460	2.641	0.048
Mother educ. above hs.	0.603	0.489	0.673	0.612	0.586	0.581	0.583	0.168	0.918

Continued on next page

	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.	0.483	0.500	0.536	0.471	0.498	0.467	0.458	0.434	0.729
Mother member of CCP	0.219	0.414	0.239	0.153	0.230	0.215	0.226	1.559	0.198
Total hh income in 2015	145658	184526	176806	147088	134164	139247	137600	0.195	0.900
z-score: household characteristics	0.044	0.974	0.089	0.004	0.087	-0.006	0.033	0.505	0.679
Category 5: *Fundamental preferences*									
Willingness to take risk	5.671	1.949	5.846	5.824	5.580	5.526	5.651	0.903	0.439
Cert. equiv. of lottery choices	11.33	5.936	11.95	10.18	11.65	12.01	10.80	4.619	0.003
Prefer risky lottery options	3.701	1.267	3.614	3.465	3.603	3.713	3.577	1.474	0.220
z-score: risk preferences	-0.024	0.982	0.071	-0.122	-0.018	0.017	-0.073	0.907	0.437
Willingness to wait for future	6.049	2.163	6.222	5.841	6.125	5.965	6.020	0.668	0.572
Tendency not to procrastinate	5.121	2.918	5.095	5.053	5.062	5.042	5.232	0.404	0.750
z-score: time preferences	0.049	0.984	0.100	-0.037	0.059	0.001	0.067	0.673	0.569
Willingness to give to good causes	6.930	2.259	6.804	7.000	7.000	6.886	6.964	0.156	0.926
Amount willing to donate	2596.6	2312.0	2469.4	2665.6	2824.2	2582.5	2527.1	1.086	0.354
z-score: altruism	-0.031	0.994	-0.087	0.006	0.047	-0.047	-0.040	0.656	0.579
Willingness to return favor	8.868	1.264	8.680	8.953	8.974	8.886	8.880	0.470	0.704
Belief that others are well-intended	5.821	2.667	5.435	6.171	5.725	5.758	6.015	1.615	0.184
Willingness to give thank-you gift	5.365	1.248	5.373	5.665	5.364	5.318	5.292	4.057	0.007
Punish who treat self unfairly	5.464	2.437	5.595	5.406	5.515	5.384	5.422	0.165	0.920
Punish who treat others unfairly	4.571	2.324	4.611	4.488	4.587	4.606	4.547	0.108	0.955
Willingness to take revenge	3.535	2.360	3.696	3.635	3.308	3.439	3.589	1.166	0.321
z-score: reciprocity	-0.017	0.994	-0.087	0.169	-0.035	-0.060	-0.002	2.035	0.107
# of obs.	1618		306	170	305	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 1,618 students who have completed midline survey.

Table A.9: Attrition in midline and endline surveys

	Completed baseline		attrited from midline			attrited from endline		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Category 1: *Personal characteristics*								
Male	0.559	0.497	0.541	0.500	0.599	0.547	0.498	0.592
Birth year	1995.8	1.278	1995.6	1.401	0.069	1995.7	1.326	0.292
Height	170.1	9.311	170.5	8.457	0.476	170.6	10.35	0.137
Han ethnicity	0.912	0.283	0.932	0.253	0.314	0.906	0.293	0.597
Born in coastal province	0.417	0.493	0.458	0.500	0.230	0.423	0.495	0.781
Resided in coastal province	0.444	0.497	0.489	0.501	0.186	0.462	0.499	0.395
Urban hukou prior to college	0.784	0.412	0.800	0.401	0.562	0.823	0.382	0.022
Religious	0.066	0.248	0.042	0.201	0.163	0.064	0.246	0.886
Member of CCP *[at baseline]*	0.068	0.252	0.089	0.286	0.216	0.080	0.272	0.239
z-score: personal characteristics	0.027	1.013	0.043	0.925	0.815	0.075	0.968	0.261
Category 2: *Educational background*								
Elite university	0.825	0.380	0.732	0.444	0.000	0.830	0.376	0.738
Science track in high school	0.731	0.444	0.742	0.439	0.716	0.706	0.456	0.172
SoSc./Hum. major at college	0.450	0.498	0.463	0.500	0.714	0.527	0.500	0.000
z-score: educational background	0.114	0.980	0.081	1.020	0.629	0.195	1.037	0.049
Category 3: *English ability and oversea travel experiences [at baseline]*								
At least Level 4 certi. in English	0.514	0.500	0.537	0.500	0.508	0.531	0.500	0.418
Taken TOEFL or IELTS	0.131	0.337	0.137	0.345	0.787	0.159	0.366	0.047
z-score: English ability	0.053	1.035	0.094	1.002	0.562	0.130	1.079	0.074
Traveled to HK, Macau, Taiwan	0.185	0.389	0.205	0.405	0.443	0.214	0.410	0.074
Traveled to foreign countries	0.248	0.432	0.311	0.464	0.036	0.280	0.450	0.077
z-score: oversea travel experiences	0.064	1.034	0.189	1.099	0.079	0.158	1.070	0.029
Category 4: *Household characteristics*								
Total # siblings	0.535	1.103	0.505	1.712	0.693	0.531	1.197	0.929
Father educ. above hs.	0.676	0.468	0.653	0.477	0.473	0.692	0.462	0.406
Father works related to govt.	0.493	0.500	0.547	0.499	0.110	0.499	0.501	0.762
Father member of CCP	0.428	0.495	0.432	0.497	0.911	0.414	0.493	0.499
Mother educ. above hs.	0.605	0.489	0.621	0.486	0.630	0.641	0.480	0.074
Mother works related to govt.	0.486	0.500	0.511	0.501	0.483	0.515	0.500	0.172
Mother member of CCP	0.225	0.418	0.274	0.447	0.091	0.255	0.436	0.086
Total hh income in 2015	147856	187049	165697	20685	0.165	160626	192250	0.102
z-score: household characteristics	0.052	0.981	0.121	1.034	0.302	0.109	1.075	0.163
Category 5: *Fundamental preferences*								
Willingness to take risk	5.678	1.948	5.732	1.945	0.688	5.878	1.907	0.014
Cert. equiv. of lottery choices	11.43	5.962	12.20	6.161	0.059	11.44	5.836	0.957
Prefer risky lottery options	3.595	1.272	3.532	1.328	0.464	3.595	1.273	0.999
z-score: risk preferences	-0.018	0.978	0.023	0.961	0.542	0.030	0.954	0.242
Willingness to wait for future	6.028	2.162	5.816	2.173	0.153	6.053	2.121	0.780
Tendency not to procrastinate	5.107	2.895	5.005	2.699	0.607	5.113	2.853	0.965
z-score: time preferences	0.038	0.986	-0.058	0.997	0.154	0.048	1.001	0.813

Continued on next page

	Completed baseline		attrited from midline			attrited from endline		
	Mean	Std.Dev.	Mean	Std.Dev.	p-value	Mean	Std.Dev.	p-value
Variables:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Willingness to give to good causes	6.919	2.264	6.832	2.303	0.573	6.913	2.305	0.945
Amount willing to donate	2608.7	2329.8	2698.1	2482.7	0.577	2548.7	2388.7	0.537
z-score: altruism	-0.031	0.984	-0.031	1.000	0.996	-0.049	1.002	0.670
Willingness to return favor	8.868	1.276	8.874	1.374	0.951	8.857	1.260	0.839
Belief that others are well-intended	5.822	2.650	5.853	2.511	0.868	5.749	2.580	0.510
Willingness to give thank-you gift	5.364	1.253	5.363	1.313	0.996	5.280	1.300	0.113
Punish who treat self unfairly	5.442	2.432	5.247	2.383	0.243	5.409	2.284	0.746
Punish who treat others unfairly	4.572	2.322	4.568	2.306	0.984	4.664	2.296	0.340
Willingness to take revenge	3.507	2.364	3.279	2.384	0.159	3.490	2.346	0.857
z-score: reciprocity	-0.023	0.992	-0.074	0.973	0.453	-0.067	0.969	0.297
# of obs.	1807		190			435		

Notes: Column 1-2 present summary statistics among 1,807 study participants who have completed baseline survey (November 2015); column 3-4 present summary statistics among 190 participants who have completed baseline survey but did not complete midline survey (May 2016); and column 6-7 present summary statistics among 435 participants who have completed baseline survey but did not complete endline survey (April 2017). Column 5 present p-value of t-tests that compare means between those who have completed midline survey and those who have not; column 8 present p-value of t-tests in means between those who have completed endline survey and those who have not.

Table A.10: 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]
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*				
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	-0.012	[0.031]	-0.006	[0.031]
Time preference above median	0.024	[0.031]	0.018	[0.031]
Altruism above median	-0.029	[0.031]	-0.027	[0.031]
Reciprocity above median	-0.025	[0.031]	-0.028	[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	-0.030	[0.031]	-0.032	[0.031]
Trust foreign media above median	-0.004	[0.032]	0.002	[0.031]

Notes: access treatment take-up is defined as students' assigned censorship circumvention tool account has recorded at least one activity throughout the experiment. Sample is restricted to 963 students in the *A* and *AE* groups.

Table A.11: Browsing activities on foreign websites among endline survey participants

	Group-A		Group-AE		
	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%	74.3%	43.8%	<0.001
Active users	48.8%	49.4%	68.4%	50.0%	<0.001
Regularly browsing *New York Times*	0.8%	9.0%	51.4%	50.0%	<0.001
Panel B: *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	9.17	12.62	9.96	15.81	0.659
Facebook	7.49	9.85	7.21	10.68	0.821
Twitter	6.91	10.16	6.71	10.87	0.873
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	2.52	<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 encouregement treatments (*Group-AE*). Sample is restricted to study participants who have completed both baseline and endline surveys. They are divided into 3 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); *(ii)* "active users" — students who have activated the tool and were actively using the tool (used the tool at least 25 times since activation); and *(iii)* "regularly browsing the *New York Times*" (at least two days per week on average throughout the experiment). Panel B shows the average daily browsing time in total and on various categories of websites throughout the experiment, 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 3 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 A.12: 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*** [0.439]	20.202*** [0.433]	19.833*** [0.499]	18.326*** [0.444]	1.263*** [0.477]	0.948** [0.475]	1.000** [0.507]	0.673 [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.13: 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.	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)
Panel A: Media-related behaviors, beliefs, and attitudes												
Category A.1: *Information source and media consumption*												
A.1.1	Ranked high: domestic websites	-0.340***	[0.106]	-0.312***	[0.110]	-0.314***	[0.109]	-	3.719	1.113	3.869	3.227
A.1.2	Ranked high: foreign websites	0.590***	[0.098]	0.539***	[0.102]	0.537***	[0.098]	-	2.252	1.163	1.949	2.707
A.1.3	Ranked high: domestic social media	-0.138	[0.086]	-0.144	[0.089]	-0.095	[0.088]	-	4.296	0.970	4.372	4.157
A.1.4	Ranked high: foreign social media	0.340***	[0.085]	0.350***	[0.088]	-	-	-	1.805	1.012	1.599	2.112
A.1.5	Ranked high: word of mouth	-0.455***	[0.098]	-0.434***	[0.099]	-0.459***	[0.097]	-	2.927	1.124	3.212	2.802
A.1.6	Freq. of visiting foreign websites for info.	1.870***	[0.141]	1.930***	[0.144]	1.830***	[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]	0.488***	[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]	12.04***	[1.489]	11.26***	[1.060]	0.001	22.80	17.62	16.91	36.15
A.3.2	Value added of foreign media access	0.847***	[0.145]	0.848***	[0.148]	0.906***	[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]	0.750***	[0.085]	0.752***	[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]	0.926***	[0.212]	1.064***	[0.163]	0.001	4.920	2.146	4.438	5.909
A.4.2	Distrust in domestic privately-owned media	0.985***	[0.160]	0.949***	[0.163]	0.952***	[0.146]	0.001	4.456	1.832	3.956	5.058
A.4.3	Trust in foreign media	1.344***	[0.156]	1.359***	[0.159]	1.315***	[0.144]	0.001	6.102	1.703	5.438	7.306
	z-score: trust in non-domestic media outlets	1.015***	[0.080]	1.000***	[0.083]	0.998***	[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]	1.057***	[0.152]	0.989***	[0.124]	-	7.682	1.600	7.168	8.322

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.	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)
A.5.2	Degree of censorship on foreign news outlets	-1.414***	[0.152]	-1.384***	[0.157]	-1.333***	[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]	1.631***	[0.176]	1.634***	[0.163]	0.001	4.415	2.053	3.679	5.636
A.6.2	Unjustified: censoring political news	1.435***	[0.231]	1.436***	[0.238]	1.511***	[0.234]	0.001	5.695	2.482	5.051	7.112
A.6.3	Unjustified: censoring social news	0.035	[0.260]	0.120	[0.271]	0.063	[0.263]	0.334	5.559	2.706	5.533	5.983
A.6.4	Unjustified: censoring foreign news	0.248	[0.274]	0.190	[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]	0.854***	[0.277]	-	-	0.003	4.346	2.788	3.796	4.740
	z-score: censorship unjustified	0.540***	[0.091]	0.551***	[0.095]	0.592***	[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]	0.127***	[0.035]	0.129***	[0.034]	-	0.881	0.323	0.825	0.983
A.7.2	Domestic cens. driven by corp. interest	-0.080***	[0.026]	-0.085***	[0.028]	-0.080***	[0.026]	-	0.053	0.224	0.102	0.017
A.7.3	Domestic cens. driven by media's ideology	-0.021	[0.019]	-0.011	[0.018]	-0.021	[0.019]	-	0.052	0.223	0.044	0.000
A.7.4	Domestic cens. driven by readers' demand	-0.023	[0.015]	-0.024	[0.016]	-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]	-0.098**	[0.040]	-0.111***	[0.038]	-	0.166	0.373	0.226	0.062
A.7.6	Foreign cens. driven by corp. interest	0.007	[0.045]	0.005	[0.046]	0.004	[0.044]	-	0.329	0.470	0.314	0.450
A.7.7	Foreign cens. driven by media's ideology	0.091*	[0.047]	0.096*	[0.048]	0.097**	[0.047]	-	0.417	0.493	0.387	0.368
A.7.8	Foreign cens. driven by readers' demand	-0.002	[0.025]	-0.003	[0.027]	0.003	[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.2.5	Steel production reduction reaches target	0.071*	[0.041]	0.063	[0.042]	-	-	0.025	0.242	0.429	0.219	0.376
B.2.6	Trump registered trademarks in China	0.098**	[0.045]	0.085*	[0.046]	-	-	0.015	0.353	0.478	0.292	0.463
B.2.7	Jianhua Xiao kidnapped in Hong Kong	0.152***	[0.045]	0.139***	[0.046]	-	-	0.004	0.740	0.439	0.650	0.802
B.2.8	Xinjiang installed GPS on all automobiles	0.183***	[0.046]	0.197***	[0.047]	-	-	0.001	0.706	0.456	0.599	0.814
B.2.9	China and Norway re-normalizes ties	0.137***	[0.046]	0.131***	[0.047]	-	-	0.004	0.688	0.464	0.606	0.707
B.2.10	Feminist groups fight women's rights	0.124***	[0.048]	0.130***	[0.049]	-	-	0.007	0.506	0.500	0.445	0.587
B.2.11	Carrie Lam becomes HK Chief Executive	0.135***	[0.045]	0.136***	[0.047]	-	-	0.004	0.354	0.478	0.299	0.463

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.	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)
	% quizzes answered correctly: poli. sensitive news	0.129***	[0.019]	0.125***	[0.028]	0.128***	[0.019]	-	0.513	0.210	0.444	0.602
B.2.15	China stops importing coal from North Korea	-0.013	[0.048]	-0.028	[0.050]	-	-	1.000	0.511	0.500	0.547	0.550
B.2.16	H7N9 influenza epidemic	0.045	[0.044]	0.047	[0.045]	-	-	1.000	0.313	0.464	0.277	0.289
B.2.17	Transnational railway in Ethiopia	-0.010	[0.046]	-0.019	[0.048]	-	-	1.000	0.628	0.483	0.642	0.682
B.2.18	Foreign reserves fall below threshold	-0.026	[0.046]	-0.026	[0.047]	-	-	1.000	0.313	0.464	0.336	0.376
	% quizzes answered correctly: nonsensitive news	-0.001	[0.025]	-0.006	[0.026]	-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]	0.137***	[0.037]	0.147***	[0.034]	0.001	0.217	0.412	0.139	0.281
B.3.2	2014 HK Umbrella Revolution	0.156***	[0.038]	0.152***	[0.039]	0.122***	[0.033]	0.001	0.247	0.431	0.161	0.397
B.3.3	2016 HK Mong Kok Revolution	0.153***	[0.038]	0.143***	[0.040]	-	-	0.001	0.250	0.433	0.168	0.413
B.3.4	2014 Taiwan Sunflower Stud. Movement	0.089*	[0.047]	0.085*	[0.048]	0.077*	[0.041]	0.015	0.657	0.475	0.613	0.702
	% protests in Greater China heard of	0.129***	[0.027]	0.125***	[0.028]	0.117***	[0.023]	-	0.373	0.308	0.304	0.460
B.3.5	2014 Ukrainian Euromaidan Revolution	0.039	[0.046]	0.058	[0.047]	[0.036]	[0.044]	0.416	0.382	0.486	0.350	0.438
B.3.6	2010 Arab Spring	0.093**	[0.043]	0.083*	[0.043]	0.079**	[0.036]	0.062	0.764	0.425	0.715	0.893
B.3.7	2014 Crimean Status Referendum	0.068*	[0.039]	0.052	[0.040]	0.048*	[0.028]	0.079	0.811	0.392	0.781	0.909
B.3.8	2010 Catalonian Indep. Movement	0.084**	[0.041]	0.065	[0.043]	0.084***	[0.025]	0.006	0.276	0.447	0.226	0.426
B.3.9	2017 Women's March around globe	0.093**	[0.046]	0.089*	[0.048]	-	-	0.064	0.385	0.487	0.336	0.521
	% foreign protests heard of	0.071***	[0.027]	0.065**	[0.027]	0.059***	[0.020]	-	0.558	0.282	0.518	0.666
B.3.10	2011 Tomorrow Revolution [fake]	0.022	[0.027]	0.031	[0.027]	0.023	[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]	0.524***	[0.194]	0.605***	[0.148]	0.001	4.357	1.935	4.109	5.070
B.5.2	Greater informedness than peers	-0.584***	[0.144]	-0.591***	[0.147]	-0.600***	[0.149]	0.001	3.997	1.576	4.219	4.843
	z-score: self-assessment of knowledge level	-0.077	[0.088]	-0.069	[0.091]	-0.061	[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]	-0.900***	[0.140]	-0.895***	[0.127]	0.001	6.351	1.672	6.820	5.691

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.	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)
C.1.2	Guess of SSCI by end of 2017	-317.3***	[40.90]	-330.4***	[41.11]	-306.8***	[41.18]	0.001	3236.7	514.36	3363.5	2820.3
	z-score: optimistic belief of Chinese economy	-0.759***	[0.076]	-0.777***	[0.080]	-0.746***	[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]	-0.004	[0.244]	0.027	[0.208]	1.000	4.723	2.305	4.635	5.124
C.2.2	Confidence of SSCI guess	0.108	[0.202]	0.134	[0.210]	-0.067	[0.178]	1.000	2.280	2.029	2.153	2.620
	z-score: confidence of guesses on Chinese economy	0.039	[0.103]	0.037	[0.107]	-0.031	[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	1.185***	[0.097]	0.198***	[0.101]	-	-	0.001	2.689	1.702	2.111	3.050
C.3.2	Guess on DJI by end of 2017	1837.8***	[272.0]	1675.3***	[268.6]	-	-	0.001	1943.2	2755.7	1860.2	2158.4
	z-score: optimistic belief of US economy	0.941***	[0.076]	0.906***	[0.076]	-	-	-	-0.115	1.003	-0.585	0.539
Category C.4: *Confidence on guesses regarding economic performance in US*												
C.4.1	Confidence of US GDP guess	0.049	[0.193]	0.040	[0.200]	-	-	1.000	2.793	2.070	2.708	3.062
C.4.2	Confidence of DJI guess	0.067	[0.167]	0.117	[0.171]	-	-	1.000	1.669	1.794	1.547	1.793
	z-score: confidence of guesses on US economy	0.034	[0.094]	0.047	[0.096]	-	-	-	-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]	0.860***	[0.214]	0.893***	[0.194]	0.001	5.249	2.167	4.825	5.909
D.1.2	Political system needs changes	1.507***	[0.186]	1.451***	[0.188]	1.548***	[0.159]	0.001	4.773	2.223	3.920	6.364
	z-score: demand for institutional change	0.622***	[0.089]	0.607***	[0.092]	0.643***	[0.080]	-	-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]	-1.475***	[0.205]	-1.530***	[0.200]	0.001	6.659	2.250	7.431	5.674
D.2.2	Trust in provincial govt. of China	-1.250***	[0.184]	-1.145***	[0.192]	-1.215***	[0.162]	0.001	5.588	2.047	6.219	4.702
D.2.3	Trust in local govt. of China	-1.104***	[0.025]	-1.077***	[0.211]	-1.082***	[0.204]	0.001	4.475	2.105	5.022	3.624
	z-score: trust in Chinese govt.	-0.700***	[0.088]	-0.661***	[0.090]	-0.681***	[0.085]	-	0.086	0.980	0.432	-0.400

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.	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)
D.2.7	Trust in central govt. of Japan	0.947***	[0.185]	0.862***	[0.194]	0.968***	[0.171]	0.001	3.673	2.073	3.226	4.814
D.2.8	Trust in federal govt. of US	0.348*	[0.194]	0.253	[0.202]	0.381**	[0.189]	0.023	4.817	1.999	4.650	5.161
	z-score: trust in foreign govt.	0.349***	[0.091]	0.300***	[0.095]	0.365***	[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]	-1.178***	[0.178]	-1.150***	[0.152]	0.001	5.638	1.180	6.197	4.645
D.3.2	Satisfaction of domestic politics	-1.308***	[0.199]	-1.211***	[0.205]	-1.207***	[0.182]	0.001	5.551	2.137	6.102	4.459
D.3.3	Satisfaction of diplomatic affairs	-0.122	[0.187]	-0.088	[0.189]	0.017	[0.177]	0.445	6.633	1.945	6.766	6.248
	z-score: satisfaction of govt's performance	-0.504***	[0.094]	-0.464***	[0.096]	-0.419***	[0.082]	-	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]	-0.990***	[0.221]	-0.936***	[0.154]	-	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]	0.521**	[0.236]	0.503**	[0.214]	0.020	6.080	2.422	5.854	6.657
D.8.2	Willing to report govt. misconduct	0.296	[0.223]	0.327	[0.232]	0.347*	[0.197]	0.030	4.964	2.347	4.883	5.508
D.8.3	Willing to stand up for the weak	0.617***	[0.203]	0.689***	[0.209]	0.683***	[0.171]	0.001	6.182	2.062	5.869	6.727
	z-score: willingness to act	0.276***	[0.095]	0.299***	[0.098]	0.297***	[0.077]	-	-0.054	0.999	-0.179	0.252
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]	0.774***	[0.225]	0.773***	[0.178]	-	4.712	2.254	4.336	5.731
E.1.2	Frequency of persuading others	0.229	[0.229]	0.231	[0.230]	0.240	[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]	0.008	[0.022]	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]	0.068	[0.049]	0.064	[0.047]	-	0.607	0.489	0.562	0.587
E.2.3	Complain to school authorities	0.068	[0.041]	0.072*	[0.042]	0.062	[0.039]	-	0.261	0.439	0.226	0.322

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.	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)
Category E.3: *Investment in the Chinese stock market*												
E.3.1	Currently invested in Chinese stock mkt.	-0.045**	[0.022]	-0.044**	[0.022]	-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]	-0.079	[0.049]	-0.117***	[0.045]	-	0.504	0.500	0.555	0.417
E.4.2	Plan: master degree abroad	0.135***	[0.036]	0.098***	[0.037]	0.109***	[0.032]	-	0.211	0.408	0.139	0.269
E.4.3	Plan: PhD degree abroad	-0.004	[0.027]	-0.016	[0.029]	-0.001	[0.024]	-	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]	-0.017	[0.037]	-0.035	[0.035]	-	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]	0.014	[0.023]	0.016	[0.023]	-	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	[0.009]	-	0.008	0.089	0.007	0.000
E.5.3	Sector pref.: military	0.004	[0.012]	0.005	[0.013]	0.003	[0.012]	-	0.019	0.135	0.015	0.017
E.5.4	Sector pref.: private firm in China	0.047*	[0.026]	0.046*	[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]	-0.025	[0.046]	-0.044	[0.042]	-	0.310	0.463	0.328	0.285
E.5.6	Sector pref.: SOEs	0.019	[0.023]	0.019	[0.025]	0.021	[0.024]	-	0.086	0.280	0.058	0.058
E.5.7	Sector pref.: inst. organizations	-0.085*	[0.046]	-0.084*	[0.048]	-0.076*	[0.040]	-	0.288	0.453	0.372	0.343
E.5.8	Sector pref.: entrepreneurship	0.003	[0.025]	0.001	[0.027]	0.010	[0.025]	-	0.067	0.251	0.073	0.095
E.5.9	Location pref.: Beijing	-0.030	[0.045]	-0.040	[0.046]	-0.033	[0.042]	-	0.288	0.453	0.314	0.202
E.5.10	Location pref.: Shanghai	0.023	[0.031]	0.028	[0.031]	0.024	[0.030]	-	0.140	0.347	0.109	0.178
E.5.11	Location pref.: Guangzhou and Shenzhen	-0.012	[0.027]	-0.010	[0.028]	-0.020	[0.024]	-	0.077	0.267	0.088	0.058
E.5.12	Location pref.: tier 2 cities in central	-0.023	[0.023]	-0.022	[0.024]	-0.024	[0.020]	-	0.050	0.219	0.066	0.058
E.5.13	Location pref.: other cities in China	-0.079*	[0.046]	-0.064	[0.047]	-0.071*	[0.039]	-	0.312	0.463	0.365	0.248
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]	0.099***	[0.027]	0.110***	[0.026]	-	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. Column 3 and 4 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 5 and 6 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 7. 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 1,130 completed endline surveys from students who have not been using censorship circumvention product at the time of baseline survey (November 2015).

Table A.14: 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

Continued on next page

		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	55	8

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.15: 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.	130.4%
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	93.5%
A.4	Trust in non-domestic media outlets	125.1%
A.5.1	Degree of censorship on domestic news outlets	57.2%
A.5.2	Degree of censorship on foreign news outlets	90.6%
A.6	Censorship unjustified	60.6%
A.7.1	Domestic cens. driven by govt. policies	147.5%
A.7.2	Foreign cens. driven by govt. policies	42.9%
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	55.8%
B.3.b	% foreign protests heard of	19.8%
B.3.c	Heard of fake protest	3.7%
B.5	Self-assessment of knowledge level	-3.8%
Panel C: Economic beliefs		
C.1	Optimistic belief of Chinese economy	138.6%
C.2	Confidence of guesses on Chinese economy	14.6%
C.3	Optimistic belief of US economy	113.9%
C.4	Confidence of guesses on US economy	-3.3%
Panel D: Political attitudes		
D.1	Demand for institutional change	75.1%
D.2.a	Trust in Chinese govt.	108.9%
D.2.b	Trust in foreign govt.	49.0%
D.3	Satisfaction of govt's performance	81.3%
D.6	Living in democracy is not important	26.3%
D.8	Willingness to act	38.3%
Panel E: Behaviors and planned behaviors		
E.1.1	Frequency of discussing poli. with friends	32.6%
E.1.2	Frequency of persuading others	20.3%
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	27.1%
E.5.5	Sector pref.: foreign firm in China	46.6%

Continued on next page

		Persuasion rates
		(1)
E.5.16	Location pref.: foreign cities	19.7%

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.16: 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	-0.332***	[0.086]	-	3.958	1.006	4.082	3.399
A.1.2	Ranked high: foreign websites	0.655***	[0.076]	-	2.162	1.036	1.818	2.722
A.1.3	Ranked high: domestic social media	-0.108	[0.075]	-	4.210	0.940	4.288	4.092
A.1.4	Ranked high: foreign social media	0.355***	[0.068]	-	1.603	0.898	1.459	2.026
A.1.5	Ranked high: word of mouth	-0.536***	[0.087]	-	3.062	1.031	3.341	2.761
A.1.6	Frequency of visiting foreign websites for info.	0.968***	[0.136]	-	4.268	1.530	3.753	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	22.99	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	0.490
Category A.4: *Trust in media outlets*								
A.4.1	Distrust in domestic state-owned media	1.203***	[0.197]	0.001	5.103	2.239	4.359	5.935
A.4.2	Distrust in domestic privately-owned media	0.952***	[0.153]	0.001	4.621	1.936	4.035	5.137
A.4.3	Trust in foreign media	0.873***	[0.152]	0.001	6.212	1.748	5.776	6.882
	z-score: trust in non-domestic media outlets	0.846***	[0.085]	-	-0.108	1.001	-0.585	0.464
Category A.5: *Belief regarding level of actual media censorship*								
A.5.1	Degree of censorship on domestic news outlets	0.987***	[0.159]	-	7.644	1.803	7.159	8.307
A.5.2	Degree of censorship on foreign news outlets	-1.137***	[0.162]	-	5.761	1.908	6.394	5.294
Category A.6: *Justification of media censorship*								
A.6.1	Unjustified: censoring economic news	1.718***	[0.173]	0.001	4.638	2.178	3.747	5.487
A.6.2	Unjustified: censoring political news	1.490***	[0.238]	0.001	5.844	2.751	5.176	7.042
A.6.3	Unjustified: censoring social news	0.149	[0.222]	0.336	5.640	2.654	5.641	6.281
A.6.4	Unjustified: censoring foreign news	-0.100	[0.225]	0.358	5.573	2.602	5.700	6.118

Continued on next page

		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	4.274	2.899	3.776	4.487
	z-score: censorship unjustified	0.438***	[0.088]	-	-0.066	0.985	-0.290	0.285
Category A.7: *Belief regarding drivers of media censorship*								
A.7.1	Domestic cens. driven by govt. policies	0.170***	[0.034]	-	0.855	0.352	0.765	0.846
A.7.2	Domestic cens. driven by corp. interest	-0.081***	[0.026]	-	0.070	0.255	0.118	0.072
A.7.3	Domestic cens. driven by media's ideology	-0.056***	[0.021]	-	0.051	0.220	0.076	0.049
A.7.4	Domestic cens. driven by readers' demand	-0.032**	[0.016]	-	0.024	0.152	0.041	0.033
A.7.5	Foreign cens. driven by govt. policies	0.016	[0.031]	-	0.152	0.360	0.141	0.108
A.7.6	Foreign cens. driven by corp. interest	0.097**	[0.041]	-	0.376	0.485	0.306	0.415
A.7.7	Foreign cens. driven by media's ideology	-0.077*	[0.042]	-	0.337	0.473	0.394	0.343
A.7.8	Foreign cens. driven by readers' demand	-0.037	[0.031]	-	0.135	0.342	0.159	0.134
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	0.018
A.8.5	Censorship: US media on neg. news in China	0.002	[0.002]	0.913	0.002	0.048	0.000	0.010
A.8.6	Censorship: US media on pos. news in China	0.005	[0.010]	1.000	0.018	0.131	0.012	0.016
A.8.7	Censorship: US media on neg. news in US	0.014*	[0.008]	0.573	0.018	0.134	0.006	0.010
A.8.8	Censorship: US media on pos. news in US	-0.000	[0.000]	1.000	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	0.011
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	1.508	0.949	1.235	1.621
A.9.2	Bias: Chinese media on pos. news in China	0.388***	[0.059]	0.001	1.617	0.610	1.400	1.765
A.9.3	Bias: Chinese media on neg. news in US	0.376***	[0.066]	0.001	1.234	0.796	1.029	1.343
A.9.4	Bias: Chinese media on pos. news in US	0.101	[0.063]	0.029	0.687	0.749	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
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

Continued on next page

		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.9.7	Bias: US media on neg. news in US	0.019	[0.059]	0.885	0.753	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	0.669	0.912	0.941
	z-score: bias calibration of US media	-0.162*	[0.086]	-	0.002	1.009	0.079	-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	0.720	0.449	0.576	0.804
B.1.2	Termination of Caixin PMI publication	0.208***	[0.040]	0.001	0.747	0.435	0.635	0.768
B.1.3	Labor unrest in China during Jan. 2016	0.227***	[0.042]	0.001	0.658	0.475	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
	z-score: quizzes on news covered in encouragement treatment	0.786***	[0.091]	-	-0.036	1.024	-0.481	0.155
Category B.2: *Current news events not covered in the encouragement treatment*								
B.2.1	Foreign leaders involved in Panama Papers	0.132***	[0.029]	0.001	0.902	0.298	0.835	0.948
B.2.2	Film on HK independence winning award	0.177***	[0.043]	0.001	0.514	0.500	0.424	0.641
B.2.3	Cause of stock market crash in Jan. 2016	0.137***	[0.036]	0.001	0.815	0.389	0.741	0.886
B.2.4	Censorship of "Economist"	0.118***	[0.044]	0.002	0.508	0.500	0.453	0.578
	z-score: quizzes on poli. sensitive news	0.617***	[0.097]	-	-0.063	1.003	0.375	0.269
B.2.5	Apple vs. FBI on San Bernardino shooting	0.015	[0.042]	0.941	0.662	0.473	0.659	0.699
B.2.6	Taiwanese presidential election in 2016	0.062	[0.044]	0.880	0.471	0.499	0.424	0.507
B.2.7	Cause of Beijing Yihe hotel attack incidence	0.036	[0.043]	0.880	0.426	0.495	0.406	0.386
	z-score: quizzes on poli. nonsensitive news	0.130	[0.083]	-	-0.006	1.005	-0.088	0.026
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	0.245
B.3.2	2014 HK Umbrella Revolution	0.147***	[0.033]	0.001	0.212	0.409	0.141	0.373
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]	0.002	0.595	0.491	0.559	0.686
	z-score: awareness of protests in Greater China	0.413***	[0.079]	-	-0.078	0.954	-0.275	0.336
B.3.5	2014 Ukrainian Euromaidan Revolution	0.022	[0.042]	0.177	0.351	0.478	0.341	0.425
B.3.6	2010 Arab Spring	0.088**	[0.039]	0.053	0.742	0.437	0.700	0.869
B.3.7	2014 Crimean Status Referendum	0.064*	[0.036]	0.057	0.793	0.406	0.765	0.905

Continued on next page

		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.3.8	2010 Catalonian Indep. Movement	0.090**	[0.038]	0.053	0.264	0.441	0.224	0.422
	z-score: awareness of foreign protests	0.228***	[0.085]	-	0.077	0.996	-0.182	0.332
B.3.9	2011 Tomorrow Revolution [fake]	-0.014	[0.028]	-	0.107	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	0.346
B.4.2	Zhiqiang Ren	0.106***	[0.034]	0.003	0.842	0.365	0.794	0.869
B.4.3	Joshua Wong	0.131***	[0.025]	0.001	0.130	0.337	0.065	0.281
	z-score: recently featured censored figures	0.440***	[0.082]	-	-0.062	0.974	-0.265	0.264
B.4.4	Zehou Li	0.038	[0.044]	1.000	0.567	0.496	0.553	0.667
B.4.5	Guangcheng Cheng	0.047	[0.038]	1.000	0.264	0.441	0.241	0.337
B.4.6	Xiaolin Li	0.016	[0.039]	1.000	0.279	0.449	0.271	0.395
	z-score: awareness of non-recent censored figures	0.232***	[0.084]	-	-0.078	0.964	-0.190	0.336
B.4.7	Yushi Mao	-0.036	[0.044]	1.000	0.498	0.500	0.518	0.565
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
	z-score: awareness of uncensored figures	-0.016	[0.089]	-	-0.021	1.008	-0.004	0.090
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	4.329	1.970	4.118	4.908
B.5.2	Greater informedness than peers	-0.667***	[0.156]	0.001	3.909	1.814	4.200	4.833
	z-score: self-assessment of knowledge level	-0.084	[0.083]	-	-0.093	0.968	-0.060	0.400
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	2.519	7.648	6.305
C.1.2	Guess of SSCI by end of 2016	-369.0***	[40.58]	0.001	3058.2	451.9	3248.5	2887.4
	z-score: optimistic belief of Chinese economy	-0.920***	[0.096]	-	0.084	1.035	0.557	-0.359

Continued on next page

		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	4.531	2.184	4.382	4.863
C.2.2	Confidence of SSCI guess	0.252	[0.166]	0.352	2.127	1.933	1.918	2.389
	z-score: confidence of guesses on Chinese economy	0.106	[0.088]	-	-0.031	0.998	-0.133	0.135
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	3.518
C.3.2	Guess on DJI by end of 2016	1247.1***	[169.1]	0.001	17268.9	1957.5	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	2.759	2.076	2.447	3.026
C.4.2	Confidence of DJI guess	0.072	[0.147]	0.454	1.562	1.689	1.488	1.817
	z-score: confidence of guesses on US economy	0.131	[0.087]	-	-0.030	1.002	-0.140	0.128
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	1.988	4.712	5.869
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]	-	-0.092	0.995	-0.382	0.396
Category D.2: *Trust in institutions*								
D.2.1	Trust in central govt. of China	-1.533***	[0.178]	0.001	6.460	2.230	7.312	5.768
D.2.2	Trust in provincial govt. of China	-1.409***	[0.181]	0.001	5.409	2.148	6.194	4.735
D.2.3	Trust in local govt. of China	-1.211***	[0.181]	0.001	4.354	2.118	5.024	3.771
	z-score: trust in Chinese govt.	-0.684***	[0.080]	-	0.060	0.986	0.439	-0.257
D.2.4	Trust in court	-0.004	[0.167]	1.000	6.720	1.922	6.694	6.503
D.2.5	Trust in police	-0.168	[0.172]	1.000	6.168	1.957	6.212	5.899
	z-score: trust in court and police	-0.047	[0.087]	-	0.025	0.985	0.030	-0.109
D.2.6	Trust in domestic financial inst.	-0.989***	[0.165]	-	6.249	1.886	6.765	5.369

Continued on next page

		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	2.204	3.218	4.742
D.2.8	Trust in federal govt. of US	0.847***	[0.186]	0.001	4.846	2.099	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	1.856	5.188	5.435
D.2.10	Trust in NGOs	1.052***	[0.170]	-	5.670	1.924	5.165	5.520
Category D.3: *Evaluation of government's performance*								
D.3.1	Satisfaction of economic dev.	-1.353***	[0.156]	0.001	5.644	1.885	6.347	4.725
D.3.2	Satisfaction of domestic politics	-1.371***	[0.183]	0.001	5.275	2.230	6.041	4.435
D.3.3	Satisfaction of diplomatic affairs	-0.134	[0.159]	0.153	6.300	1.856	6.435	6.041
	z-score: satisfaction of govt's performance	-0.511***	[0.083]	-	0.072	0.991	0.362	-0.309
Category D.4: *Performance evaluation criteria*								
D.4.1	Importance: universal suffrage	0.006	[0.004]	-	0.090	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	6.848	1.901	6.288	7.572
D.5.2	Severity: employment	0.881***	[0.165]	0.001	6.798	1.864	6.324	7.346
D.5.3	Severity: environmental pollution	0.793***	[0.157]	0.001	7.925	1.668	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	1.135***	[0.167]	0.001	6.693	1.995	6.335	7.634
D.5.6	Severity: minority discrimination	1.839***	[0.192]	0.001	3.827	2.407	2.824	4.971
	z-score: severity of socioeconomic issues	0.832***	[0.084]	-	-0.100	1.000	-0.537	0.427
Category D.6: *Evaluation of democracy and human rights protection in China*								
D.6.1	China cares interest for masses	-1.054***	[0.182]	0.001	5.128	2.192	5.653	4.242

Continued on next page

		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.6.2	Level of democracy in China	-0.696***	[0.157]	0.001	4.995	1.885	5.329	4.121
D.6.3	Level of human rights protection	-1.033***	[0.177]	0.001	5.353	1.990	5.871	4.458
D.6.4	Living in democracy is not important	-0.672***	[0.204]	0.001	3.022	2.092	3.329	2.471
	z-score: eval. of China's democracy and human rights	-0.591***	[0.090]	-	0.106	0.983	0.389	-0.456
Category D.7: *Justification of controversial policies and issues*								
D.7.1	Justified: minority policies	-1.464***	[0.194]	0.001	6.116	2.300	6.953	4.948
D.7.2	Justified: migration restrictions	-1.157***	[0.180]	0.001	5.152	2.296	5.765	4.327
D.7.3	Justified: one-child policy	-1.210***	[0.202]	0.001	5.261	2.383	5.976	4.438
D.7.4	Justified: policy towards HK	-1.016***	[0.156]	0.001	6.547	1.952	7.129	5.804
D.7.5	Justified: policy towards Taiwan	-1.144***	[0.153]	0.001	6.421	1.945	7.082	5.761
D.7.6	Justified: govt. use of violence	-1.240***	[0.219]	0.001	4.034	2.664	4.647	3.085
D.7.7	Justified: refusal of DPRK refugees	-0.869***	[0.192]	0.001	4.731	2.191	5.082	4.013
D.7.8	Justified: prod. cut to reduce pollution	0.119	[0.162]	0.162	7.377	1.767	7.282	7.225
D.7.9	Justified: college admission policies	0.240	[0.160]	0.053	6.938	1.840	6.853	6.977
D.7.10	Justified: privatization of SOEs	0.279	[0.209]	0.065	5.550	2.347	5.371	5.500
	z-score: justification of govt. policies	-0.546***	[0.082]	-	0.098	0.992	0.365	-0.421
D.7.11	Justified: legal. of homosexual marriage	1.164 ***	[0.263]	0.001	6.473	2.864	5.971	7.425
D.7.12	Justified: legal. of prostitution	1.409***	[0.238]	0.001	3.345	2.838	2.629	4.722
D.7.13	Justified: abortion	1.354***	[0.224]	0.001	5.260	2.629	4.524	6.291
D.7.14	Justified: extra-marital sex	-0.272	[0.256]	0.210	3.958	2.899	4.135	4.683
D.7.15	Justified: transgenetic food	0.295	[0.195]	0.109	5.963	2.176	5.882	6.235
D.7.16	Justified: soft drugs usage	0.039	[0.209]	0.398	2.320	2.284	2.365	2.650
	z-score: justification of liberal issues	0.323***	[0.089]	-	-0.074	0.997	-0.206	0.317
Category D.8: *Willingness to act*								
D.8.1	Willing to battle illegal govt. acts	0.518**	[0.213]	0.016	6.095	2.389	5.818	6.830
D.8.2	Willing to report govt. misconduct	0.080	[0.210]	0.308	4.898	2.387	4.929	5.048
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	0.219**	[0.091]	-	-0.048	1.007	-0.150	0.205
Category D.9: *Interest in politics and economics*								
D.9.1	Interest in economics	0.965***	[0.219]	0.001	5.762	2.393	5.218	6.353
D.9.2	Interest in politics	0.670***	[0.219]	0.001	5.040	2.454	4.729	2.530

Continued on next page

		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)
	z-score: interest in politics and economics	0.384***	[0.091]	-	-0.034	1.002	-0.246	0.194
Category D.10: *National identity*								
D.10.1	Proud of being Chinese	-0.219	[0.155]	-	7.800	1.825	7.947	7.252
Category D.11: *Fear to criticize the government*								
D.11.1	Fear to criticize govt. in public	0.421**	[0.201]	-	5.040	2.282	4.718	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]	-	4.441	2.360	4.088	5.373
E.1.2	Frequency of persuading others	0.269	[0.218]	-	5.386	2.404	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	-0.136***	[0.044]	-	0.479	0.500	0.535	0.451
E.4.2	Plan: master degree abroad	0.186***	[0.033]	-	0.236	0.425	0.135	0.261
E.4.3	Plan: PhD degree abroad	0.005	[0.025]	-	0.088	0.284	0.088	0.144
E.4.4	Plan: military in China	0.007	[0.008]	-	0.010	0.099	0.007	0.003
E.4.5	Plan: work right away	-0.013	[0.029]	-	0.115	0.319	0.129	0.095
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

Continued on next page

		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)
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]	-	0.385	0.487	0.388	0.346
E.5.7	Sector pref.: inst. organizations	-0.065	[0.042]	-	0.583	0.493	0.653	0.542
E.5.8	Sector pref.: entrepreneurship	0.010	[0.043]	-	0.367	0.482	0.382	0.412
E.5.9	Location pref.: Beijing	0.027	[0.038]	-	0.281	0.450	0.247	0.275
E.5.10	Location pref.: Shanghai	-0.023	[0.028]	-	0.124	0.330	0.118	0.160
E.5.11	Location pref.: tier 2 cities in south	-0.040	[0.025]	-	0.068	0.252	0.100	0.069
E.5.12	Location pref.: tier 2 cities in central	-0.020	[0.023]	-	0.056	0.229	0.076	0.036
E.5.13	Location pref.: other cities in China	-0.036	[0.041]	-	0.303	0.460	0.335	0.225
E.5.14	Location pref.: HK and Macau	0.015***	[0.005]	-	0.012	0.110	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]	-	0.149	0.357	0.112	0.196

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).