# Media Trust and Persuasion*

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**Abstract**

This study examines the effect of media use on media trust and persuasion using a large-scale randomized field experiment, which was conducted in collaboration with the nation's most trusted media outlet. By randomly increasing the capacity for viewing its TV programs, we found that this treatment increased support for government policies by increasing program viewing time, which is, as we demonstrate, biased in favor of the government. Furthermore, we determined that the effect is driven mostly by those who trusted the outlet more than other broadcasters and that their levels of trust in the outlet were even *increased* by our treatment, which we call *endogenous persuasion*. By contrast, we did not discover heterogeneous effects with respect to political preferences. To better understand the mechanism underlying these findings, we developed a model of endogenous persuasion.

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# 1 Introduction

Media trust and persuasion are interlinked. Individuals trust media outlets that they prefer and obtain information from those that they trust more. In the United States (US), for example, Republicans (Democrats) are known to trust right-leaning (left-leaning) media outlets more than those on the other side of the political spectrum (Pennycook and Rand, 2019). In addition, public media sources are the most trusted by people in many countries (Newman et al., 2018).

The relationship between people's trust in media outlets and their use is indicated in the communication science literature (Strömbäck et al., 2020; Tsfati and Cappella, 2003). However, causal evidence to understand the underlying mechanisms remains scarce. Furthermore, how people's trust in media affects their susceptibility to persuasion and evolves with their media use is unknown. Discovering the mechanism underlying the interaction between media trust, media use, and persuasion will enable us to better understand the causes and mechanisms of recent political polarization between countries (Boxell et al., 2020).

In this study, we provide new evidence that was yielded by a large-scale field experiment to fill this gap in the research. The experiment was conducted in 2016; it was performed in Japan as a collaborative effort with the nation's most trusted media outlet, the national public television (TV) company (hereinafter "Public TV").[1] In the experiment, we recruited 6,000 individuals who lived in the greater Tokyo area and randomly increased the treatment group's capacity to view Public TV's programs. Using this experiment, we examined the impact of the outlet's TV programs on people's support for government policies and their subjective evaluations of the government's capability.

Our findings showed that individuals' support for government policies increased after viewing Public TV's programs for a longer duration. The effect was driven mostly by those who trusted Public TV more than private broadcasters, and their trust levels were even *increased* by our treatment. These findings indicate that media trust tends to be endogenous and that susceptibility to persuasion depends on how much individuals trust such outlets. We call this phenomenon *endogenous persuasion*.[2] However, we did not find heterogeneous effects with respect to individuals' political preferences.

Next, we develop a model of endogenous persuasion to further understand the mechanism underlying these findings. The model assumed that consumers' trust levels in certain media outlets

[1] The experiment is registered at the AEA RCT Registry (AEARCTR-0005335).

[2] There is another term called *self-persuasion* (Schwardmann et al., 2021). Compared to direct persuasion, *self-persuasion* is the "causal effect of persuasion goals on beliefs and attitudes" (p.1). Conversely, endogenous persuasion captures the phenomenon in which individuals are directly persuaded by media outlets and their susceptibility to persuasion depends on their trust levels in the outlets.

affect their viewing behavior and that their viewing history in turn affects their trust levels. Using this model, we investigated the conditions under which endogenous persuasion is more likely to occur. According to the model's prediction, consumers need to be *skeptical* rather than *credulous* about the information from media outlets for endogenous persuasion to work.

Finally, to further understand the information to which the subjects were exposed during the experiment, we use a novel method to measure media slant. Specifically, we measured the semantic similarity between the content of TV programs and that of official statements made by domestic and foreign governments by applying an unsupervised machine learning technique (Le and Mikolov, 2014).[3] Using this similarity measure, we found that Public TV's information is far closer to the domestic government than to the foreign government, compared to the information provided by private broadcasters.

Taken together, these results indicate that individuals, particularly those who trusted Public TV more than other broadcasters, were more likely to be exposed to the media's slanted information in favor of the government during the experiment. Their exposure to such information in turn increased their subjective evaluations of certain policies as well as their level of trust in this media outlet. These results are consistent with the model's prediction as to when consumers are skeptical rather than credulous.

This work contributes to a large body of literature on media and information in social sciences, especially recent literature that emphasizes the role of trust in media use. In economics, Gentzkow et al. (2020) theoretically showed that arbitrary, small biases in processing noisy feedback can cause large ideological biases in trust in information sources as well as in beliefs about facts. In social psychology, Pennycook and Rand (2019) found that laypeople across the political spectrum rated mainstream sources as more trustworthy than either hyper-partisan or fake news sources.[4] Finally, in communication science, the association between media skepticism and exposure to (non-)mainstream news has been investigated (Strömbäck et al., 2020; Tsfati and Cappella,

[3] This technique has several advantages; in particular, it has no requirement for selecting words *ex ante*. Although previous studies often use predetermined word categories that are created by researchers (Tetlock, 2007; Qin et al., 2017, 2018), this step can be skipped in our method because the machine automatically computes the semantic similarity using a plain corpus, or a list of plain text, such as Google Books Corpora. In addition, compared to similar methods employed by previous studies, such as counting the frequency of words in texts (i.e., bag-of-words or bag-of-n-grams), our algorithm accounts for the ordering and semantics of words as well as for the contextual differences between documents. Regarding the last point, roughly speaking, our algorithm employs a "fixed-effects" procedure in which the estimated parameter captures the contextual specificity of a document (or a TV program, in our context) when maximizing the probability of observing a target word.

[4] Although these authors concluded that having algorithms up-rank content from trusted media outlets (i.e., mainstream sources) on social media platforms might reduce the spread of misinformation on social media, our results warn that up-ranking the most trusted media outlets can exacerbate political polarization if the mainstream sources themselves are slanted. For example, if Republicans prefer Fox News (or Democrats prefer MSNBC), owing to endogenous persuasion, then they tend to trust the outlet more and are more easily persuaded by it.

2003). However, to the authors' best knowledge, our research is the first to demonstrate causal evidence for the impact of media use on media trust and persuasion by using the randomized controlled trial. The results of our study indicate that persuasion is the outcome of the endogenous process of consumers' media trust and media use.

Second, the present study adds new evidence to the literature on media slant and persuasion. Previous studies have found that a slanted TV channel influences the vote share (DellaVigna and Kaplan, 2007; Martin and Yurukoglu, 2017; Durante et al., 2019) and political knowledge (Schroeder and Stone, 2015). Further, another study determined that slanted newspapers have no influence on the vote share, political knowledge, or political opinions, although reading such newspapers did increase support for Democratic candidates and increase voter turnout (Gerber et al., 2009). Here, we empirically demonstrate that media trust is an important factor that affects individuals' susceptibility to persuasion.

Third, this study is also related to the theoretical literature documenting the role of independent media outlets. The existence of such media outlets should reduce the degree of media slant in the market by enabling consumers to cross-check information (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006).[5] If the public media's information is less slanted than that of the private media for some reason, the public media would play a crucial role in mitigating media slant. However, although Public TV is the sole public TV company in Japan, our study indicates that its information is far from neutral, which raises a concern regarding the independence of public media outlets in general. Moreover, even if there are independent media, this mechanism may not work well enough if people stick to specific media outlets that they trust more.

Fourth, this study contributes to the literature on the sources of media slant, which can be driven by either supply-side factors (e.g., owners, advertisers, and journalists) or demand-side factors (e.g., consumers).[6] Regarding the supply-side factors, the media controlled by a state, party, or politician are slanted in China (Qin et al., 2018; Chen and Yang, 2019), Berlusconi's Italy (Durante and Knight, 2012), and Russia (Enikolopov et al., 2011). Using a structural model, Szeidl and Szucs (2021) determined that owner ideology and favor exchange are important determinants of media slant in Hungary. Conversely, Gentzkow and Shapiro (2010) showed that media slant in US newspapers was driven by consumer rather than owner preferences.[7] These mixed findings in

[5] Strömberg (2015) also showed that competition leads to the under-provision of information compared to the social optimum, which can be alleviated by public media or a Pigouvian subsidy.

[6] Besley and Prat (2006) showed that an incumbent is more likely to "buy" unfavorable information from a media outlet to avoid the disclosure of information to voters but only if doing so is less costly than the rents that are generated by holding office.

[7] Gentzkow et al. (2015) also found little evidence that the ruling party influenced the partisan composition of the

various countries may indicate that the factors that affect media slant, whether supply- or demand-side factors, depend on the degree of media independence and media market competition. Our study shows that public media outlets can also be slanted, and we argue that supply-side factors are the main source of the slant in our case.

Fifth, the literature on the impact of new information technology on political outcomes is also related to this work because our experiment involves online streaming. Previous studies have demonstrated that voter turnout has declined owing to the diffusion of TV (Gentzkow, 2006) and the Internet (Falck et al., 2014; Campante et al., 2018; Gavazza et al., 2019). Using data from the US, Prior (2005) discovered that new information technology widened the knowledge gap and turnout between individuals who preferred news and those who preferred entertainment. However, Boxell et al. (2017) found that a greater use of the Internet was not associated with political polarization in the US. More recent literature has established that the global expansion of 3G mobile networks reduced government approval (Guriev et al., 2021).[8]

Finally, our study contributes to the literature on the analysis of political language. Previous studies use "word scores" (Laver et al., 2003), think-tank citations (Groseclose and Milyo, 2005), and party phrases (Gentzkow and Shapiro, 2006; Jensen et al., 2012; Martin and Yurukoglu, 2017; Gentzkow et al., 2019). As previously mentioned, our unsupervised machine learning method has several advantages, including no requirement to select words of interest *ex ante*.

The remainder of this work is organized as follows. Sections 2 and 3 describe our experiment and data. Section 4 reports the results of the experiment. Section 5 examines the role of media trust; we also develop a model of endogenous persuasion. Section 6 uses machine learning to unpack the information provided by media outlets during the experiment. Section 7 discusses the results, and Section 8 concludes the work.

## 2 Experiment

In November and December 2016, an online randomized controlled trial was conducted in the greater Tokyo area.[9] We recruited a local survey company to administer the experiment. The

press in the US.

[8] Zhuravskaya et al. (2020) provides an excellent survey on the political outcomes of the Internet and social media.

[9] The experiment was part of independent experiments that were conducted by Public TV in 2015 and 2016. Although some private broadcasters provided Internet streaming services, Public TV did not provide such services until the Broadcast Act was revised in 2014, which allowed it to provide an Internet streaming service if it met certain criteria. One of the criteria was that such a service should not harm market competition. To test whether the streaming service met this criterion as well as other criteria, Public TV conducted large-scale randomized experiments in 2015 and 2016; our study focuses on the 2016 experiment. In the 2015 experiment, Kuroda et al. (2017) found no evidence that the streaming service harmed market competition. The 2016 experiment was significantly greater in

target population comprised 6,000 Internet users who lived in the greater Tokyo area.[10]

The entire procedure consisted of the following steps. First, we created 40 blocks according to age (i.e., 20s, 30s, 40s, 50s, and 60s), sex (i.e., male or female), and TV viewing frequency (i.e., almost every day, at least once a week, at least once a month, and hardly ever or never). We recruited individuals such that the percentage of each block in the sample was proportional to the population in each category in the greater Tokyo area.[11]

Next, the company sent a recruiting email to registered individuals to explain the surveys and rewards.[12] The email clearly stated that the purpose was to survey the individual's daily media access and media evaluations. The email also stated that participants would keep a daily viewing record of TV programs. To minimize selection bias, the respondents were not informed of the availability of free Internet streaming services at the recruitment stage. The participants were told about this benefit as a surprise just before the start of the experiment.

Finally, we assigned 5,000 of the 6,000 individuals randomly to the treatment group and assigned the remainder to the control group.[13]

As the main treatment, we randomly provided the treatment group with free subscriptions to view Public TV's programs online. In particular, the treated individuals could view Public TV's programs on web browsers and mobile phones. The services comprised live streaming and video on demand (VOD). The treatment thus increased the individual's capacity for viewing Public TV's programs.

Although Public TV did not provide a live streaming service before the experiment, it offered a paid VOD service.[14] Some programs were not available during the experiment owing to copyright issues.[15] In addition, because of government regulation, only programs that started at 7:00 am or after and that ended by 11:00 pm were available for both services. By contrast, the VOD service was accessible at any time.

terms of scope and size than the 2015 experiment.

[10] We determined this number to maximize the statistical power given the existing budget restrictions and government regulations.

[11] More specifically, we derived the representative numbers from Public TV's public opinion poll, which was conducted in the greater Tokyo area in July 2016.

[12] The company did not disclose the details of the rewards to us, but the rewards were based on an incentive criterion, according to a reply from the company. Most importantly, there was a bonus for completing a viewing record (see the Data section).

[13] We used the `randomize` command in Stata 14. Further, we allocated more than half the individuals to the treatment group owing to the second experiment. In the second experiment, we sent program recommendations to randomly selected subgroups in the treatment group on Fridays. The Online Appendix provides further details on and an analysis of this second treatment (Section A.4.6).

[14] The monthly subscription fee for the VOD service was 972 Japanese yen (JPY) (approximately 10 US dollars (USD)) or a minimum of 100 JPY (approximately 1 USD) per program.

[15] Around 16% of all broadcasting time was not provided in these services.

Figure 1 shows the timeline of the experiment. We started recruitment and conducted the baseline survey at the end of October 2016. Subsequently, we randomized the subjects. All the participants began keeping a viewing record on November 14. The free online services became available for the treatment group on November 28. Finally, the endline survey was conducted after the end of the experiment on December 18.

# 3 Data

Our main data were each subject's viewing record.[16] The participants received a daily email from the survey company asking them to note the TV programs (Public TV's and private broadcasters' programs) that they viewed that day. Although the data were self-reported, we alleviated potential measurement errors in several ways. First, to reduce the reporting cost, the participants simply checked the names of the TV programs that they viewed on the computer screen. Second, the participants were incentivized to complete the entire survey.[17] Third, we excluded unreliable samples by comparing self-reported data with the access log. Finally, we employed the instrumental variable (IV) method in the main analyses.

In the baseline survey, we requested information regarding the participants' socioeconomic status, media usage, media evaluations, and political orientation. In the endline survey, we asked for their evaluations of policies and the government's capability in addition to media usage and media evaluations, which constitute our main outcome variables.

In addition, we collated unique data using a digital TV recorder: TV scripts from every TV channel in the Tokyo region, including private broadcasters.[18]

Because 1,524 individuals (1,280 in the treatment group and 244 in the control group) did not complete the endline survey, 23 people decided not to participate in the experiment, and one individual's viewing records were deemed unreliable,[19] our final sample comprised 4,452 people (74.2%).

We conducted balance checks between the treatment and control groups in the final sample

[16] For the treated individuals, the access log of Public TV's Internet streaming service was also available. We could not use the access log for the main analysis because no such data existed for the control group. The Online Appendix provides an analysis using these data for this subset of individuals (Section A.4.6).

[17] The bonus was given to the individuals only upon the completion of the entire survey. The survey company did not inform the participants of the exact amount or formula to avoid any strategic behavior. The participants were also given 3 days to complete their reports.

[18] The recorder provided an application programming interface to extract program information including the titles, descriptions, and scripts. We used Python to obtain information from the recorder and then saved them in comma-separated value format.

[19] This individual reported that s/he viewed almost every TV program daily.

using variables from the baseline survey (see Section A.2 of the Online Appendix). Most variables were balanced between the two groups, suggesting that randomization was successful. Since some variables were not balanced,[20] we included them as a baseline control in the following analysis. Section A.3 of the Online Appendix provides a check regarding attrition bias.

Further, Section A.1 of the Online Appendix presents the summary statistics of the main variables.

# 4 Baseline Results

## 4.1 First Stage: Effect on Viewing Time

The first analysis examines whether the treatment increases the viewing time of Public TV's programs, in particular, Channel 1 (henceforth "Public 1").[21] Specifically, we run the following using an ordinary least squares (OLS) regression:

$$\Delta\text{Public\_1}_i = \alpha + \beta\text{Treatment}_i + \mathbf{X_i}\gamma + \varepsilon_i, \tag{1}$$

for individual $i$, where $\Delta\text{Public\_1}_i$ is the difference in viewing time (in hours) of Public 1 before (November 14–27) and during (November 28–December 18) the experiment, $\text{Treatment}_i$ is the treatment dummy, $\mathbf{X_i}$ is a vector of the control variables, and $\varepsilon_i$ is the error term, which we assume is independently distributed across the individuals.[22] Our main interest is the estimate of $\beta$. Using the difference in viewing time, we remove any systematic differences in the usual viewing pattern between individuals that we cannot completely control.

Columns (1)–(3) in Table 1 show the average treatment effect on the viewing time of Public 1. Column (1) does not include the baseline control variables, whereas Columns (2) and (3) do. Column (3) excludes individuals who occasionally failed to report viewing records for certain programs, although they were likely to view them according to the access log. Overall, the treatment increased the viewing time of Public 1 by approximately 1 hour. In the following analysis, we use the smallest sample to minimize any measurement errors.

In the Online Appendix, we also investigate the effect by week (Section A.4.2) and on other channels (Section A.4.3).

[20] These variables were a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; and trust and accuracy measures.

[21] Public TV has two channels: 1 and 2. Public 2 differs slightly from Public 1 as it focuses on educational programs.

[22] Recall that there is a pre-treatment period in the viewing records from which we obtain information on pre-treatment viewing behavior.

### 4.2 Second Stage: Effect on Political Evaluations

Next, we investigate the main effect of watching Public 1 for a longer time on political evaluations. Before reviewing the results, we describe the background information and the regression equation.

Two major political events occurred during the experiment; both were related to foreign policy. The first was President Vladimir Putin's visit to Japan on December 15 and 16 to attend a summit. The main topic of the meeting concerned the territorial dispute between Japan and Russia over four islands—Etorofu, Kunashiri, Shikotan, and Habomai—known as "the Northern Territories dispute." The main interest of the Japanese public was whether there would be any progress on that issue during the meeting (*The Economist*, 2016; Chugrov and Streltsov, 2017). The second major event was that then-Prime Minister Shinzō Abe announced that he would visit Pearl Harbor with then-President Barack Obama. Although the event actually occurred after the experiment (December 26–28), the first public announcement was made on December 5 (i.e., during the experiment).

Figure 2 shows the popularity of each topic as measured by the frequency of Google searches in Japan according to Google Trends. It indicates that "真珠湾" (Shinju-wan or Pearl Harbor) became more popular after the first public announcement by then-Prime Minister Abe and that "北方領土" (Hoppō-ryōdo or the Northern Territories) became more popular during the summit. For the purpose of comparison, the search results for "交通事故" (Kōtsū-jiko or traffic accident) were also presented, which showed no systematic pattern.

Accordingly, we included survey questions on these two major political events in the endline survey: "How do you evaluate the government's measures against the Northern Territories dispute?" and "How do you evaluate Prime Minister Abe's visit to Pearl Harbor with President Obama?" The participants rated each question on a scale from 0 (the lowest rating) to 10 (the highest rating). In addition, we asked the participants to evaluate the capability of the government to implement policy, with four possible answers ranging from agreement to disagreement.

To assess the effect of watching Public 1 on these outcomes, we ran the following OLS regression:

$$\text{Evaluation}_i = \phi + \psi \Delta\text{Public\_1}_i + \mathbf{X_i}\xi + \nu_i, \tag{2}$$

for individual $i$, where $\text{Evaluation}_i$ is the political evaluation just described, $\Delta\text{Public\_1}_i$ is the difference in the viewing time of Public 1 as in equation (1), $\mathbf{X_i}$ is a vector of the baseline control variables, and $\nu_i$ is the error term, which we assume is independently distributed across the individuals. We are interested in the estimate of $\psi$.

In a simple regression model (2), the estimated $\psi$ may be biased because $\Delta\text{Public\_1}_i$ is likely to be endogenous. This bias can work in either direction. On one hand, if the participants who view the channel longer tend to positively evaluate the government, the effect is likely to be overestimated. On the other hand, if those who view the channel longer tend to be skeptical about the government, the effect is likely to be underestimated. Thus, to isolate the causal effect, we used the treatment variable as an instrument for $\Delta\text{Public\_1}_i$ in the IV framework.

Columns (4)–(6) in Table 1 show the results. The second panel shows the OLS estimates for equation (2). The results are not statistically significant for all the dependent variables. Next, the third panel reports the IV (two-stage least squares, 2SLS) estimates in which we used the treatment variable as the instrument. Although watching Public 1 longer affects neither the evaluation of the government's capability nor the evaluation of Prime Minister Abe's visit to Pearl Harbor (Columns (4) and (5), respectively), it has a statistically significant and positive effect on the evaluation of the government's measures to settle the Northern Territories dispute (Column (6)). Namely, the treatment group is more likely than the control group to positively evaluate the government's effort regarding the territorial dispute. The first-stage F-statistic is slightly greater than the conventional level for a single instrument. In addition, we conducted weak instrument robust inference and report the resulting 95% confidence intervals and p-values. Column (6) indicates that the confidence intervals include only positive values and that the effect remains significant.[23]

The estimate (0.243) implies that a one-standard-deviation increase in the viewing time of Public 1 (8.848) increases the evaluation by 2.15 or approximately one-half of the control mean. Therefore, this effect is modestly large. Overall, the OLS estimates are underestimated, suggesting a second channel of bias as previously described.[24]

Finally, the bottom panel shows the estimates for the reduced-form regressions in which outcomes are regressed on the treatment variable and covariates. As expected, the intention-to-treat effect on the evaluation of the government's capability and Prime Minister Abe's visit to Pearl Harbor is null, while that on the evaluation of the Northern Territories dispute is statistically different from zero and positive.

[23] In Section A.4.1 in the Online Appendix, we show the distribution of the outcome variables for the treatment and control groups using raw data. The difference is observed over a wide range of domains for the evaluation of the government's measures in response to the Northern Territories dispute, suggesting that the effect is not particularly driven by individuals with certain prior opinions on that issue.

[24] Another interpretation might be that the average treatment effect is smaller than the local average treatment effect. However, given that the independent variable is most likely to be endogenous, this is less likely to be the main reason.

# 5 Media Trust

## 5.1 Empirical Findings

Next, we examine the heterogeneous effects of exploiting different levels of trust in various broadcasters.[25] As noted in the Introduction, Public TV is the most trusted media outlet in Japan (Newman et al., 2018). This was also confirmed by our data.[26]

In this section, we consider two questions. First, what is the interaction effect between media trust and our treatment? Second, are the levels of trust changed by our experiment?

To answer these questions, we first create a variable to measure the *net* level of trust in Public TV by subtracting the participants' trust in private broadcasters from their trust in Public TV. This variable takes a positive value if the participants trust Public TV more than private broadcasters, and *vice versa*. Subsequently, we interact this variable with the treatment variable to create an interaction variable.

Table 2 shows the estimation results using these variables. Column (1) shows that the net trust levels were balanced between the treatment and control groups before the experiment. Columns (2) and (3) use the same dependent variables as those in (3) and (6) in Table 1. Interestingly, significant results only appear for those who trusted Public TV more than private broadcasters, although the estimates for those who trusted Public TV more are sometimes statistically indistinguishable from the estimates for those who trusted private broadcasters more. Furthermore, comparing the coefficients between two tables indicates that the effects that we observed earlier are driven mostly by the same type of individuals. This result is consistent with the observation that individuals tend to obtain information from media outlets that they trust more (e.g., Gentzkow et al., 2020).

Regarding the second question, we used the post-experimental net trust level as the dependent variable in Column (4). Interestingly, this shows that the net trust levels among those who trust Public TV more than private broadcasters were *increased* by the treatment.

Figure 3 shows the changes in the net trust levels for those who trusted Public TV more.[27] We see that the distribution is shifted by the treatment.

Overall, these results imply that trust levels are self-enforcing such that individuals obtain information from the media outlets that they trust more and, by doing so, gain even more trust

[25] We examine the heterogeneous effect on other variables in Section A.4.1 of the Online Appendix. There is no heterogeneous effect with respect to political preferences.

[26] The mean values are 2.99 (public) and 2.80 (private) when the trust levels are measured according to a scale from 1 (for the lowest) to 4 (for the highest) level of trust. Section A.4.1 of the Online Appendix shows the distribution of the trust levels.

[27] The raw data are also shown in Section A.4.1 of the Online Appendix.

in the outlets. We call this phenomenon *endogenous persuasion* in the sense that individuals endogenously get influenced by certain media outlets by trusting the outlets more. Moreover, individuals are likely to be persuaded by the media outlets that they trust more. Thus, persuasion may be a gradual process: individuals are not persuaded immediately; rather, they need to trust certain media outlets before they can be persuaded.

In the next subsection, we introduce a simple but general model to explain the endogenous persuasion mechanism. In particular, we are interested in investigating when it does and does not work.

## 5.2 A Model

Here, we present our model of endogenous persuasion, which considers the effect of media trust on media use as well as the effect of media use on media trust. This model considers that trust in a media outlet positively affects viewing it, as we have seen in the empirical section of this work. The model also captures that the trust in a media outlet progresses endogenously by watching the outlet's programs. In the following sections, we first describe the model settings and then document the transition in the trust levels.

### 5.2.1 Settings

In our model, we use the following subscripts:

- $i \in I$ represents a consumer;
- $j \in J$ represents a media outlet where $J = \{\text{Public, Private, NoWatch }\}$; and
- $t$ represents when a TV program starts.

**Media and contents.** Media outlet $j$ provides program content $C_{jt} \in \mathbb{R}$ in period $t$. We assume that content $C_{jt}$ takes a higher value when the media outlet provides information that is closer to what the government provides. Later, we measure the slant of the program content using machine learning and textual data in Section 6.1. From the consumer's and econometrician's perspectives, $C_{jt}$ is a random variable from some continuous distribution $\mathscr{C}_j$. In addition, we assume that all media outlets have a domestic bias $E(C_{jt}) > 0$ because we consider only domestic broadcasters in our settings.

Consumers have no information regarding the content $C_{jt}$ at the beginning of time period $t$ but have some beliefs about the content labeled $C^e_{ijt} \in \mathbb{R}$. We assume that the consumer's beliefs have

some continuous distribution $\mathscr{C}^e_{ij}$. In addition, we assume that all consumers have the same belief about media $j$ at the initial stage:

$$C^e_{ij1} = 0 \quad \text{for all } i. \tag{3}$$

**Trust.** In communication science, trust is defined as "the expectation that the interaction with the trustee would lead to gains, rather than losses, for the trustor" (Tsfati and Cappella, 2003, p.505). Following this definition, we define trust as a consumer's subjective evaluation that a media outlet provides content that is preferable to them. This implies that consumers gain a higher utility from more rather than less trusted media.

In our data, the trust variable takes a discrete value from 1 to 4. We assume that observed categorical trust, $\text{Trust}_{ijt}$, is the result of some continuous root trust, $\text{trust}_{ijt} \in \mathbb{R}$, such that observed trust is an increasing function of root trust.[28] Empirically, we can observe only the initial value of trust ($\text{trust}_{ij1}$) and its post-experimental value ($\text{trust}_{jT+1}$). For the remaining periods, we assume that root trust can be updated when a media outlet provides a higher utility than the consumers' expected utility.

Consumer $i$'s root trust in media $j$ at period $t+1$ is a function of the prior root trust ($\text{trust}_{ijt}$), received information from media $j$ ($C_{jt}$), subjective beliefs about program content ($C^e_{ijt}$), and action $I_{ijt} \in \{1,0\}$ where $I_{ijt} = 1$ when consumer $i$ watches media $j$ in period $t$ and $I_{ijt} = 0$ otherwise. The transition of root trust occurs when consumer $i$ watches program content $C_{jt}$ ($I_{ijt} = 1$). The law of motion of root trust is as follows:

$$\text{trust}_{ijt+1} = \text{trust}_{ijt} + P(C_{jt} > C^e_{ijt}) \cdot h(C_{jt} - C^e_{ijt}). \tag{4}$$

Thus, updated root trust is current root trust plus the increment of root trust $P(C_{jt} > C^e_{ijt}) \cdot h(C_{jt} - C^e_{ijt})$ where $P$ is the cumulative distribution function of $C_{jt}$ and $h(>0)$ is an increasing or decreasing function of $C_{jt} - C^e_{ijt}$. This incremental term captures the updating probability and size. For

[28] For example, when observed trust takes the value of an integer from 1 to $K$, root trust and observed trust can take an ordered logit form as follows:

$$\begin{aligned}
P(\text{Trust}_{ijt} = 1) &= 1 - \tfrac{exp(\text{trust}_{ijt} - \kappa_1)}{1+exp(\text{trust}_{ijt} - \kappa_1)} \\
&\vdots \\
P(\text{Trust}_{ijt} = k) &= \tfrac{exp(\text{trust}_{ijt} - \kappa_{k-1})}{1+exp(\text{trust}_{ijt} - \kappa_{k-1})} - \tfrac{exp(\text{trust}_{ijt} - \kappa_k)}{1+exp(\text{trust}_{ijt} - \kappa_k)} \\
&\vdots \\
P(\text{Trust}_{ijt} = K) &= \tfrac{exp(\text{trust}_{ijt} - \kappa_K)}{1+exp(\text{trust}_{ijt} - \kappa_K)},
\end{aligned}$$

where $\kappa_k$ is the threshold value of trust level $k$.

example, if consumer $i$ has less belief in media $j$'s program content, the probability of observing a higher $C_{jt}$ becomes greater. However, even if the consumer observes an unexpectedly higher $C_{jt}$ such that $C_{jt} - C^e_{ijt}$ is high, they do not necessarily increase their trust level in media $j$ if $h$ is a decreasing function. Therefore, it becomes crucial to know the form of $h$ as it has various empirical implications. The details of the transition of trust are described in Section 5.2.2.

**Transition of beliefs.** Consumers update their belief in the program content based on their realization of content $C_{jt}$ using the following updating rule:

$$C^e_{ijt+1} = g(C^e_{ijt}, C_{jt}), \tag{5}$$

where $g$ depends on the updating rule. We assume that $g$ is differentiable but do not specify the form in the following analysis.

**Media choice.** We assume that the consumer chooses a media outlet that provides the highest expected utility in every period. The expected utility of consumer $i$ from choosing media $j$ in period $t$ is

$$U_{ijt} = E(u(\text{trust}_{ijt}, C^e_{ijt}, \text{Treatment}_i)), \tag{6}$$

where $\text{Treatment}_i$ is some instrument that makes it easy for consumer $i$ to watch a certain media outlet. In our case, we let this outlet be Public TV. As mentioned earlier, we assume that $\frac{\partial U_{ijt}}{\partial \text{trust}_{ijt}}$ is positive. Regarding the belief in program content, we assume that consumers prefer watching programs that may provide a higher $C^e_{ijt}$ because the domestic government, rather than a foreign government, represents the interests of its own people. Finally, regarding the treatment variable, we assume that $u(\text{trust}_{i,Public,t}, C^e_{i,Public,t}, \text{Treatment}_i = 1) - u(\text{trust}_{i,Public,t}, C^e_{i,Public,t}, \text{Treatment}_i = 0) > 0$. Put differently, the treatment group is more likely to view Public TV, as we observed in the empirical section.

### 5.2.2 Transition of Trust

As mentioned earlier, the progress of $\text{trust}_{ijt}$ depends on the functional form of $h$. The form of $h$ determines whether the difference in trust in media $j$ between consumers tends to decrease or

increase. To ascertain this, we differentiate equation (4) with respect to $\text{trust}_{ijt}$ as follows:

$$\begin{aligned}\frac{\partial \Delta \text{trust}_{ijt+1}}{\partial \text{trust}_{ijt}} &= -p(C_{jt} > C^e_{ijt})\frac{\partial C^e_{ijt}}{\partial \text{trust}_{ijt}} h(C_{jt} - C^e_{ijt}) - P(C_{jt} > C^e_{ijt})\frac{\partial h(C_{jt} - C^e_{ijt})}{\partial C^e_{ijt}}\frac{\partial C^e_{ijt}}{\partial \text{trust}_{ijt}} \\ &= -\frac{\partial C^e_{ijt}}{\partial \text{trust}_{ijt}}\left[p(C_{jt} > C^e_{ijt})h(C_{jt} - C^e_{ijt}) + P(C_{jt} > C^e_{ijt})\frac{\partial h(C_{jt} - C^e_{ijt})}{\partial C^e_{ijt}}\right], \qquad (7)\end{aligned}$$

where $p(\cdot)$ is a density function. Regarding the expression in square brackets, the first term is the effect of change on the updating probability, and the second term is the effect of change in the updating size.

Suppose $\frac{\partial C^e_{ijt}}{\partial \text{trust}_{ijt}} > 0$.[29] If, in addition, $\frac{\partial h(C_{jt} - C^e_{ijt})}{\partial C^e_{ijt}} > 0$, equation (7) is always negative. Conversely, if $\frac{\partial h(C_{jt} - C^e_{ijt})}{\partial C^e_{ijt}} < 0$ and the effect of change in the updating size dominates the effect of change in the updating probability, the entire expression can be positive. Put differently, the necessary condition to keep the same order of trust levels across individuals (i.e., so that individuals who trust a media outlet more are not overtaken by those who trust it less) is for $h$ to be a decreasing function (given that $\frac{\partial C^e_{ijt}}{\partial \text{trust}_{ijt}} > 0$ holds).

**Theorem 1** *Suppose* $\frac{\partial C^e_{ijt}}{\partial trust_{ijt}} > 0$. *Whether the difference in trust in a media outlet between consumers tends to increase or decrease depends on the functional form of* $h$. *When* $h$ *is an increasing function, trust levels will converge; when* $h$ *is a decreasing function, trust levels can diverge.*

What does it mean that $h$ is a decreasing function? Consider the opposite: if $h$ is an increasing function, it means that individuals are *credulous*. Namely, they trust the media outlet that provides more preferable content than what they expected. By contrast, a decreasing function means that individuals are rather *skeptical*. They trust the media outlet that provides content that is similar to but slightly more preferable than what they expected.

In the empirical analysis, we determined that the difference in the net level of trust in Public TV between consumers has diverged (i.e., those who trusted the media outlet more became more likely to trust it). According to Theorem 1, this implies that the individuals in our data are more likely to be skeptical than credulous. Endogenous persuasion works only if individuals are skeptical.

# 6 Media Slant

Thus far, we have found that our treatment increased political evaluations by viewing Public TV's programs longer and that the effects are mostly driven by those who trusted the media outlet

[29] We show that this assumption is likely to hold in our data in Section A.5 of the Online Appendix.

more than other outlets. Furthermore, the level of trust in the media outlet also increased by the treatment, which implies that the subjects in our data are likely to be skeptical according to our model.

However, what kinds of program content (or $C_{jt}$ in the model) were the participants exposed to during the experiment? In this section, we use machine learning and TV script data to answer this question.

### 6.1 The Similarity Measure

First, we introduce an unsupervised machine learning algorithm to compute the semantic similarity between TV programs and the official statements made by domestic (i.e., Japan) and foreign governments (i.e., the US and Russia).

To obtain the semantics of words from textual content, Firth (1957) initially proposed the distributional hypothesis, which assumes that words used in the same context tend to have a similar meaning.[30] In our case, the similarity between two words is captured by the cosine similarity of fixed-length numerical vectors between these words. We use an algorithm to compute these numerical vectors (Le and Mikolov, 2014).

First, we train a machine such that it maximizes the probability of observing a word given a certain context in a sentence (e.g., predict the fourth word from "the," "cat," and "sat").[31] Once the process is complete, we compute the similarity between each TV program at the time of the experiment and each official statement using the semantic similarity between the words in these documents. We use the average of the semantic vectors of words in a document to compute the semantics of the entire document. Using this definition, two documents are more semantically similar if they contain more semantically similar words. A formal explanation is provided in Section A.7.1 of the Online Appendix. The final outcome takes a value between -1 (very far) and 1 (very close).

As described in the Introduction, a major advantage of the algorithm is that it accounts for the ordering and semantics of words as well as for the contextual differences between documents. In this case, a TV program is considered a document. That is, we allow for a word in a TV program to differ semantically from the same word in another TV program. The algorithm also does not require the *ex ante* selection of words by researchers. Instead, it computes the semantic similarity between words using only a corpus as a reference.

[30] The distributional hypothesis and distributed semantics are summarized by Eisenstein (2019).
[31] This is also called the paragraph vector in the distributed memory model.

The data used to train the machine (i.e., the corpus) included the scripts of TV programs that were broadcast after the experiment through August 28, 2018.[32] This choice of corpus was based on the characteristics of our study; other studies can also use other corpora, such as Google Books Corpora, depending on their purpose. We used Python's `gensim` package for all the procedures.

Since Japanese texts, unlike Western texts, are not separated into single words in the original data, we parsed the scripts using a common Japanese parser called `MeCab`. We used only nouns, verbs, adjectives, and adverbs so that our measures could capture the similarity between texts in a meaningful manner.[33] In addition, we applied stemming for all words. There were 195,016 TV programs containing 613,497 distinct words included in the training data.

For the official statements, we used those made by the Japanese and US governments when Prime Minister Abe and President Obama visited Pearl Harbor[34] and those by the Japanese and Russian governments when Prime Minister Abe and President Putin met at the summit in Japan.[35] In each case, the statements concerned the same topic and spoken to the public almost simultaneously in the same place. Thus, the only difference between the official statements for each event is whether the statement was made by the domestic or the foreign government.

Table 3 shows the difference in the closeness between the programs and official statements. To begin with, we take the difference in the closeness to either government (domestic or foreign) for each program and then compare the averages for the two types of broadcasters (i.e., Public 1 and private broadcasters). The top panel of the table also considers the program's duration, while the bottom panel does not.

First, the table shows that all the differences are statistically significant. Moreover, the differences are all positive, indicating that Public 1's information is closer to the domestic government's than that of the foreign government compared to private broadcasters' information. Interestingly, the difference between Japan and Russia is somewhat greater than that between Japan and the US.

[32] The reason for not including the experimental period in the training data is to avoid any direct connection between the texts used for training and those used to measure closeness. The reason for including only data until August 28, 2018, was that the latest version of the dictionary (when we obtained the data) used in the parsing process (NEologd) contained data only until that date. Although the dictionary is constantly updated, we avoided using the running version to enable the replication of our results.

[33] The following parts of speech were excluded: interjections, conjunctions, particles, auxiliary verbs, prefixes, and determiners.

[34] The official statements are available from the Cabinet Office's website (https://warp.ndl.go.jp/info:ndljp/pid/10992693/www.kantei.go.jp/jp/97_abe/statement/2016/1227usa.html) (Prime Minister Abe's speech) and the US Embassy and Consulates in Japan's website (https://americancenterjapan.com/aboutusa/translations/4739/) (President Obama's speech).

[35] The official statements for both countries are available in Japanese from the Cabinet Office's website (https://warp.ndl.go.jp/info:ndljp/pid/10992693/www.kantei.go.jp/jp/97_abe/statement/2016/1216kaiken.html).

In the next subsection, we consider the participants' viewing behavior. In particular, we assess whether individuals are exposed to slanted information.

### 6.2 Exposure to Slanted Information

To measure the exposure variable, we calculate the sum of the similarity measure between each watched TV program and official document, weighted by the duration of the program for each individual. In other words, this variable captures the average exposure to information provided by either government. Finally, the exposure to the foreign government's information is subtracted from the exposure to the domestic government's information to formulate a *net* exposure variable.

Formally, for individual $i$ and official statement $l \in \{\text{Japan, USA, Russia}\}$, we compute the following:

$$\text{AvgExposure}_{ijl} := \sum_{p_j} \{1[\text{View}_{ip_j}] \times \text{Duration}_{p_j} \times \text{Closeness}_{p_j l}\}, \tag{8}$$

where $1[\text{View}_{ip}]$ is an indicator variable that takes the value of 1 if $i$ viewed program $p_j$ of media $j$ and 0 otherwise, $\text{Duration}_{p_j}$ denotes the duration of program $p_j$ measured in hours, and $\text{Closeness}_{p_j l}$ is the similarity between program $p_j$ and the official statement made by government $l$, which we created in the previous section.

Next, we take the difference between these measures for the domestic government and foreign government $l' \in \{\text{USA, Russia}\}$ as follows:

$$\Delta\text{AvgExposure}_{ijl'} := \text{AvgExposure}_{ij\text{Japan}} - \text{AvgExposure}_{ijl'}. \tag{9}$$

Intuitively, $\Delta\text{AvgExposure}_{ijl'}$ aims to capture the average exposure to the official statement made by the domestic government relative to the average exposure to the official statement made by the foreign government. This variable takes a greater positive value if individuals are exposed more to information that is more closely related to that provided by the domestic government than that by the foreign government.[36]

Figure 4 shows the results. Each point in the figure corresponds to the individual's exposure to particular information, namely, $\text{AvgExposure}_{ijl}$ in (8). The exposure to the domestic government's information is plotted against the exposure to the foreign government's information. The red lines indicate the 45-degree lines.

[36] $C_{jt}$ in the model is similar to the difference $\text{Closeness}_{p_j Japan} - \text{Closeness}_{p_j l'}$; the only difference is that the units for the former are the time that each program starts, whereas for the latter, it is the entire program $p_j$. This difference becomes trivial because we aggregate exposure values at the individual level.

Strikingly, the left panels show that the data points tend to be located above the 45-degree lines, particularly for those individuals who are far away from the origin, indicating that they were more likely to be exposed to information that is closer to the domestic government's information than that of the foreign government by viewing Public 1's programs for a longer time. This result becomes even starker when compared to the right panels, which plot the same figures but for the private channels. This shows that the data points are more or less on the 45-degree lines even though there are five times more data points in the panels compared to the respective left panels. These results suggest that the participants were affected by information somewhat unique to Public 1 during the experiment.

Next, to assess whether the positive second-stage result on the political evaluations is explained by this informational difference, we next use the closeness measures in the regressions. The top panel of Table 4 shows the first-stage results in which we use the treatment dummy as the main independent variable and the similarity between Public 1 and official statements as the dependent variable. "Δ Japan–Russia" is the difference in the average closeness between the Japanese and Russian governments.

Columns (1) and (4) include all the TV programs broadcast by Public 1; Columns (2) and (5) include only programs categorized as related to Prime Minister Abe; and Columns (3) and (6) include only programs categorized as related to Russia. Overall, the table shows that the treatment group was more likely to receive information closer to that provided by the domestic government than by the foreign government. This finding may be unsurprising given the previously observed slant in Public 1's information.

We also check the heterogeneous effect according to the trust levels. Column (5) in Table 2 uses the same dependent variable as Column (3) in Table 4. This variable indicates that those who trust Public TV more than private broadcasters are more likely to be exposed to slanted information.

Next, the second panel of Table 4 shows the OLS estimates in which the evaluation of the Northern Territories dispute is the dependent variable (i.e., the same dependent variable used in Column (6) in Table 1) and the closeness measures are the independent variables. The bottom panel of the table shows the IV (2SLS) estimates wherein the treatment variable is the instrument.

Although the effect is somewhat weak in some of the specifications, all the IV estimates have a positive sign, indicating that individuals are more likely to positively evaluate the government's measures in response to the Northern Territories dispute by being exposed to information closer to that provided by the domestic government. Because the F-statistic in the first stage is less than the conventional level, we also conducted weak instrument robust inference and report the p-values

and confidence intervals. Compared to standard confidence intervals, these intervals tend to be wider. However, they include only positive values, indicating that the true effect is more likely to be positive than negative or null.

In terms of magnitude, the estimate in Column (4) (7.357) shows that a one-standard-deviation (0.681) increase in the treatment variable increases the evaluation by 5. Therefore, the effect size is considerable.

Overall, we find that the treated individuals, particularly those who trusted Public TV more, positively evaluated certain foreign policies because they were more exposed to information closer to that provided by the domestic government during the experiment.

# 7 Discussion

Why is Public TV's information closer to that provided by the domestic government than that of the foreign government compared to private media information in the first place? As noted in the Introduction, the literature shows that the media slant is driven by either demand- or supply-side factors. Regarding the demand-side factors, because viewers pay fees to receive media content regardless of their political orientation, it is difficult to believe that consumers' political preferences (e.g., right vs. left) drive the slant in the public media's information. The same argument holds for public media in other countries, such as Sweden and the United Kingdom, where most adults pay similar fees or taxes.

Turning to supply-side factors, as reception fees are mandatory for anyone with TV equipment, changing information in public media should not affect revenue. Furthermore, their annual budgets and board members require Diet approval, and they do not receive any commercial advertising revenue. These factors indicate that the most plausible explanation might be that public media are more susceptible to media capture by the government, if anything.

An alternative hypothesis could be that the public media's information might be more biased toward the ruling party than the opposition party compared to private media information. We tested this hypothesis in the Online Appendix but found no supporting results.[37] In other words, competition between political parties does not seem to explain our results.

Finally, although we found that the public media's information tends to be closer to the domestic government's information for both topics, only the result for the Northern Territories dispute in Table 1 is significant. A possible explanation might be that the summit had just ended when the

[37] However, we determined that public media information is slanted toward the ruling party.

endline survey was conducted, while Prime Minister Abe's visit to Pearl Harbor was ongoing. The former event might have endorsed the participants' beliefs and therefore influenced their survey answers.

# 8 Conclusion

In this study, we examined the effect of media use on media trust and persuasion. We conducted a large-scale randomized experiment in Japan in collaboration with the nation's most trusted media outlet, the national public TV company or "Public TV." We recruited 6,000 individuals for the experiment and randomly increased the treatment group's capacity to view Public TV's programs by giving them free subscriptions. Our treatment increased the subjects' viewing time of Public TV's programs as well as their support for certain policies. Interestingly, we found that the effect was driven mainly by those who trusted Public TV more than private broadcasters and, surprisingly, that their trust levels were even increased by the treatment, a phenomenon we call endogenous persuasion.

A policy implication of our findings is that having independent media outlets in the market does not necessarily mitigate political polarization among the population (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006). Creating institutions that promote public media independence is the first step; however, such independent media need to be trusted by the population.

Although we conducted a randomized experiment to obtain a generalizable causal effect, the external validity of our results should be tested in different settings.

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## Tables and Figures

Table 1: Effect on viewing time and political evaluations

| | Dependent variable: | | | | | |
|---|---|---|---|---|---|---|
| | Δ Public_1 | | | Evaluation | | |
| | (1) | (2) | (3) | (4) Gen. eval. | (5) Pearl Harbor | (6) North. Terr. |
| First-stage | | | | | | |
| Treatment | 0.815 | 0.887 | 1.082 | | | |
| | (0.329)** | (0.331)*** | (0.336)*** | | | |
| Controls | No | Yes | Yes | | | |
| Mean of control | 0.27 | 0.27 | 0.27 | | | |
| $R^2$ | 0.00 | 0.01 | 0.01 | | | |
| Observations | 4452 | 4452 | 4156 | | | |
| OLS estimates | | | | | | |
| Δ Public_1 | | | | 0.002 | 0.006 | −0.002 |
| | | | | (0.001) | (0.004) | (0.004) |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 2.34 | 6.90 | 4.41 |
| $R^2$ | | | | 0.23 | 0.11 | 0.11 |
| Observations | | | | 4156 | 4156 | 4156 |
| IV estimates (Second-stage) | | | | | | |
| Δ Public_1 | | | | 0.042 | 0.044 | 0.243 |
| | | | | (0.031) | (0.090) | (0.115)** |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 2.34 | 6.90 | 4.41 |
| F-stat. | | | | 10.38 | 10.38 | 10.38 |
| Effect. F-stat. | | | | 10.38 | 10.38 | 10.38 |
| p-value (AR) | | | | 0.14 | 0.62 | 0.01 |
| CI (AR) | | | | [-.013, .144] | [-.153, .284] | [ .074, .696] |
| CI (Wald) | | | | [-.019, .103] | [-.133, .221] | [ .017, .469] |
| Observations | | | | 4156 | 4156 | 4156 |
| Reduced-form | | | | | | |
| Treatment | | | | 0.046 | 0.048 | 0.263 |
| | | | | (0.031) | (0.097) | (0.095)*** |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 2.34 | 6.90 | 4.41 |
| $R^2$ | | | | 0.23 | 0.11 | 0.12 |
| Observations | | | | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables for Columns (1)–(3) are the difference in the viewing time of Public 1 before and during the experiment (in hours). The dependent variables for Columns (4)–(6) are (a) the evaluation of the government's capability ("Do you evaluate that the current government has the capability to implement policies?" (4: Yes, 3: More or less, 2: Not quite, 1: No)) (Column (4)), (b) the evaluation of Prime Minister Abe's visit to Pearl Harbor with President Obama ("How do you evaluate Prime Minister Abe's visit to Pearl Harbor with President Obama?" (0 to 10 points)) (Column (5)), and (c) the evaluation of the government's measures against the Northern Territories dispute ("How do you evaluate the government's measures against the Northern Territories dispute?" (0 to 10 points)) (Column (6)). The IV is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; and trust and accuracy measures. "Effective F-stat." is the effective F-statistic of Olea and Pflueger (2013). We use Stata's `weakivtest` to compute the test statistic. Weak instrument robust inference (Anderson–Rubin (AR) test) is conducted and the corresponding p-values and confidence intervals are reported in rows labeled as "p-value (AR)" and "CI (AR)," respectively. We use Stata's command `rivtest` to compute the test statistic. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table 2: Treatment and media trust

| | Dependent variable: | | | | |
|---|---|---|---|---|---|
| | (1) Pre Trust | (2) Δ Public_1 | (3) North. Terr. | (4) Post Trust | (5) Δ Japan–Russia |
| Treatment | −0.009 | | | | |
| | (0.019) | | | | |
| Treatment × Trust Public more | | 1.129 | 0.245 | 0.054 | 0.021 |
| | | (0.350)*** | (0.097)** | (0.022)** | (0.011)* |
| Treatment × Trust Private more | | 0.041 | 0.661 | 0.270 | 0.019 |
| | | (0.346) | (0.497) | (0.169) | (0.013) |
| Trust | | −0.850 | −0.058 | 0.563 | 0.045 |
| | | (0.523) | (0.475) | (0.155)*** | (0.017)*** |
| Controls | Yes | Yes | Yes | Yes | Yes |
| control mean | 0.219 | 0.267 | 4.405 | 0.220 | 0.126 |
| H0: b[Treatment × Trust Public more] = b[Treatment × Trust private more] (p-value) | | 0.027 | 0.411 | 0.205 | 0.863 |
| $R^2$ | 0.44 | 0.01 | 0.12 | 0.16 | 0.04 |
| N | 4156 | 4156 | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables are the net trust level in Public 1 before the experiment (Column (1)), the difference in the viewing time of Public 1 before and during the experiment (Column (2)), the evaluation of the government's measures against the Northern Territories dispute (Column (3)), the net trust level in Public 1 after the experiment (Column (4)), and the difference in the closeness to official statements made by domestic and foreign governments (Column (5)), respectively. "Treatment × Trust Public more" is the interaction between the treatment variable and the net trust dummy, which takes a value of 1 if an individual trusts Public TV more than or as much as private channels, and 0 otherwise. "Treatment × Trust Private more" is the interaction between the treatment variable and 1 minus the net trust dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table 3: Difference in closeness

| | Public_1 - Private TVs | p-value |
|---|---|---|
| Interacted with duration | | |
| Japan–USA | 0.225 | 0.025 |
| Japan–Russia | 1.133 | 0.000 |
| Without interaction | | |
| Japan–USA | 0.015 | 0.000 |
| Japan–Russia | 0.031 | 0.000 |

*Note.* For each program, the difference in the closeness to either government (domestic or foreign) is computed. Then, their averages are compared for the two types of broadcasters (Public 1 and (the average of) private channels). The differences and associated p-values are reported. The top panel takes into account the duration of the program, while the bottom panel does not. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 200. See the main text for more details.

Table 4: Effect on political evaluations of the difference in the closeness to official statements

| | Dependent variable: | | | | | |
|---|---|---|---|---|---|---|
| | Δ Japan–Russia | | | Evaluation (North. Terr.) | | |
| | (1) All programs | (2) PM topic | (3) Russia topic | (4) All programs | (5) PM topic | (6) Russia topic |
| First-stage | | | | | | |
| Treatment | 0.037 | 0.025 | 0.016 | | | |
| | (0.015)** | (0.009)*** | (0.007)** | | | |
| Controls | Yes | Yes | Yes | | | |
| Mean of control | 0.40 | 0.18 | 0.13 | | | |
| $R^2$ | 0.77 | 0.65 | 0.63 | | | |
| Observations | 4156 | 4156 | 4156 | | | |
| OLS estimates | | | | | | |
| Δ Japan-Russia | | | | 0.140 | 0.208 | 0.329 |
| | | | | (0.103) | (0.155) | (0.216) |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 4.41 | 4.41 | 4.41 |
| $R^2$ | | | | 0.12 | 0.12 | 0.12 |
| Observations | | | | 4156 | 4156 | 4156 |
| IV estimates (Second-stage) | | | | | | |
| Δ Japan-Russia | | | | 7.357 | 10.929 | 17.338 |
| | | | | (3.800)* | (5.544)** | (9.532)* |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 4.41 | 4.41 | 4.41 |
| F-stat. | | | | 6.21 | 6.78 | 5.18 |
| Effect. F-stat. | | | | 6.21 | 6.78 | 5.18 |
| p-value (AR) | | | | 0.00 | 0.00 | 0.00 |
| CI (AR) | | | | [ 2.391, 22.255] | [ 3.246, 32.661] | [ 4.883, 54.702] |
| CI (Wald) | | | | [-.092, 14.806] | [ .063, 21.795] | [-1.344, 36.020] |
| Observations | | | | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables for Columns (1)–(3) are the difference in the closeness to official statements made by domestic and foreign governments. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 200. The dependent variables for Columns (4)–(6) are the evaluation of the government's measures against the Northern Territories dispute. The main independent variables are the treatment variable (for Columns (1)–(3)) and the difference in the closeness to the official statements made by the domestic and foreign governments (for Columns (4)–(6)). "Δ Japan–Russia" is the difference in average closeness to the official statements made by the Japanese and Russian governments during President Putin's visit to Japan for the summit. Column (1) and (4) include all programs. Columns (2) and (5) restrict the sample to programs related to Prime Minister Abe, while Columns (3) and (6) restrict to programs related to Russia. The instrument is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. "Effective F-stat." is the effective F-statistic of Olea and Pflueger (2013). We use Stata's `weakivtest` to compute the test statistic. Weak instrument robust inference (AR test) is conducted and the corresponding p-values and confidence intervals are reported in rows labeled as "p-value (AR)" and "CI (AR)," respectively. We use Stata's command `rivtest` to compute the test statistic. *, **, and *** indicate $p<0.10$, $p<0.05$, and $p<0.01$, respectively.

Figure 1: Timeline of the experiment

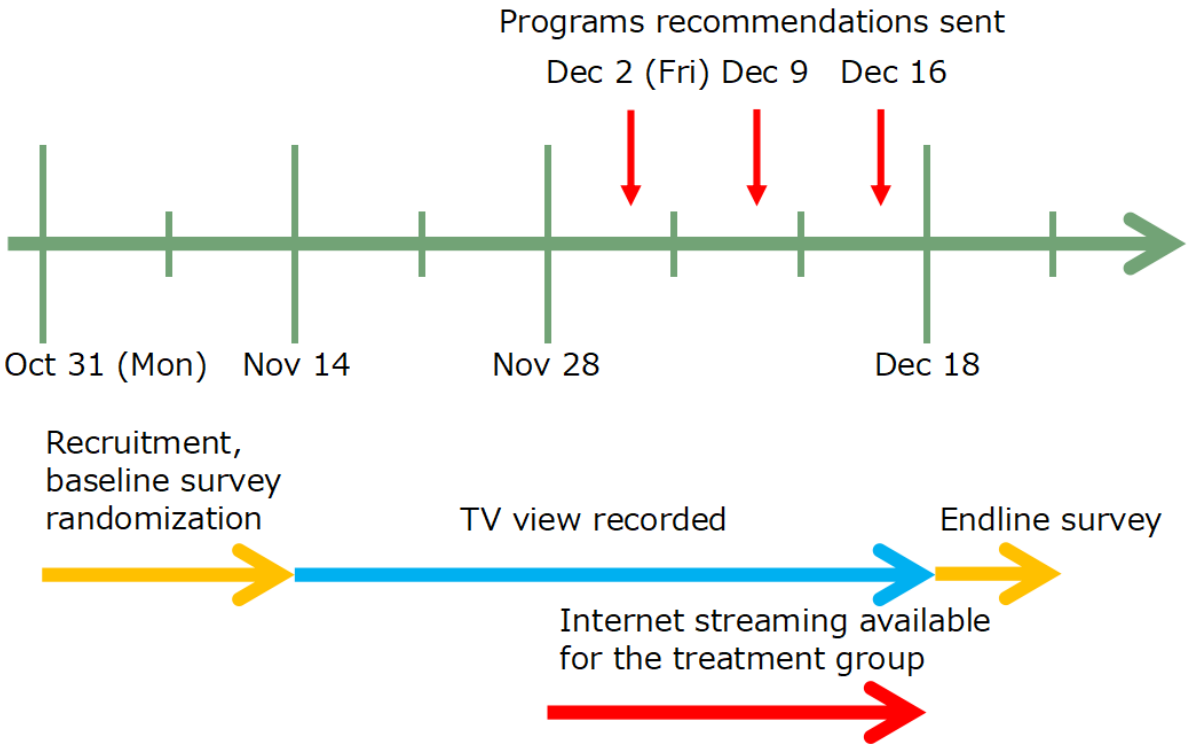
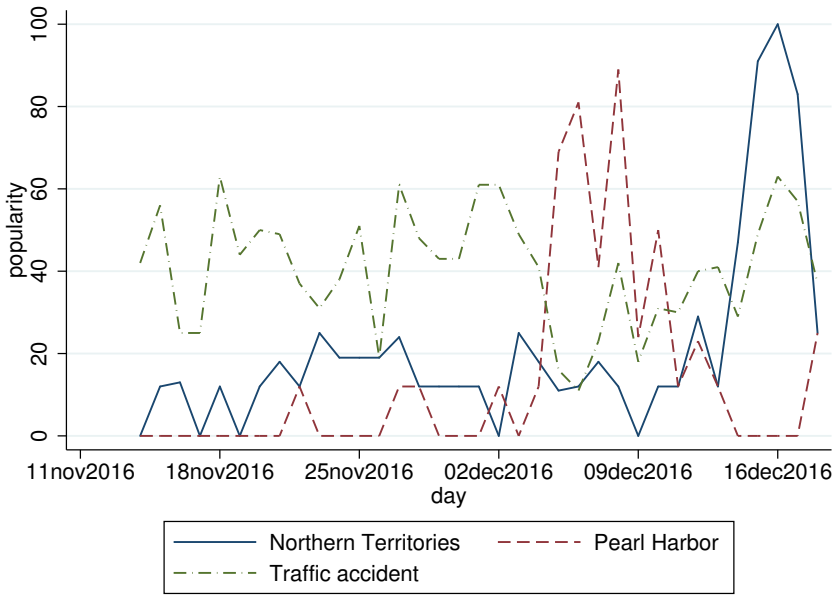
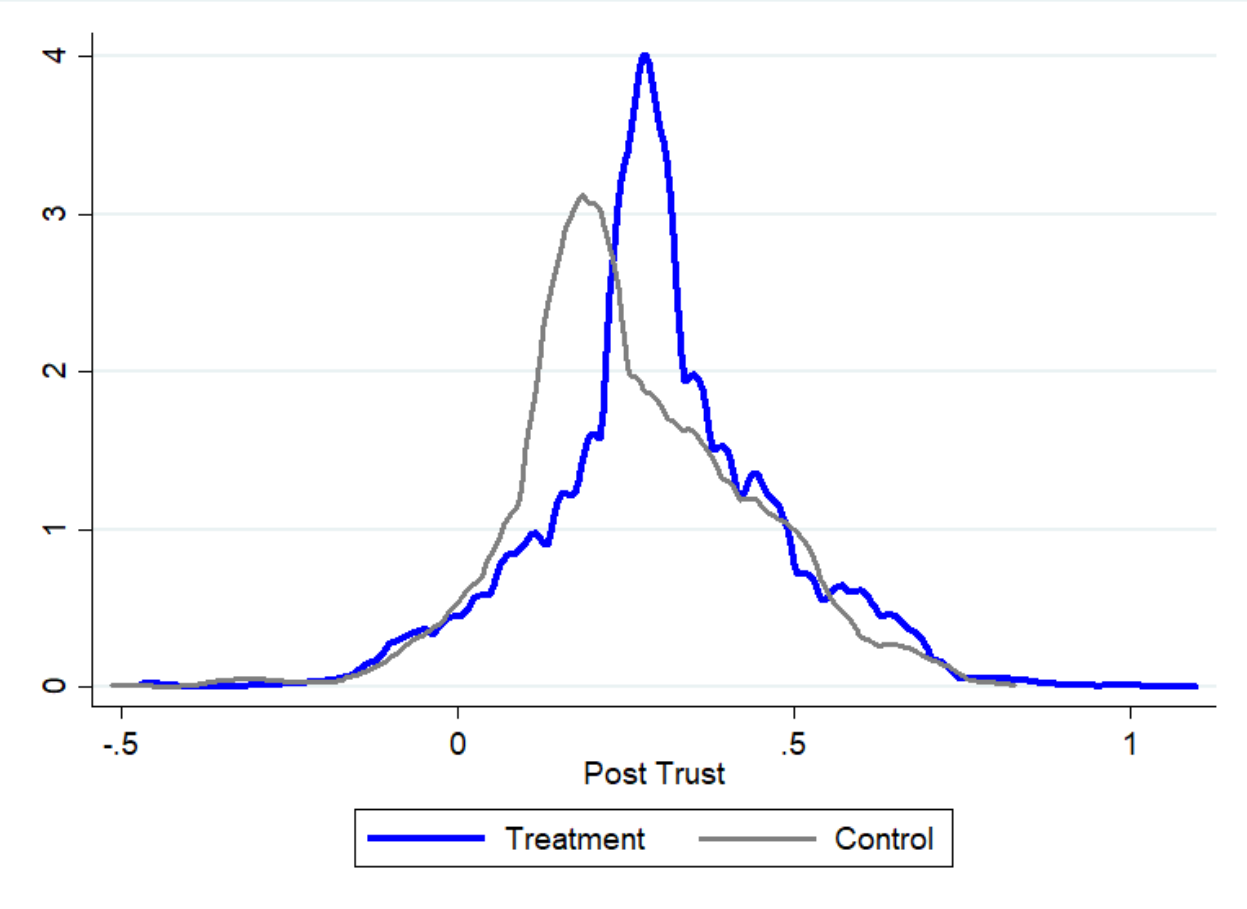


Figure 2: Popularity of each topic



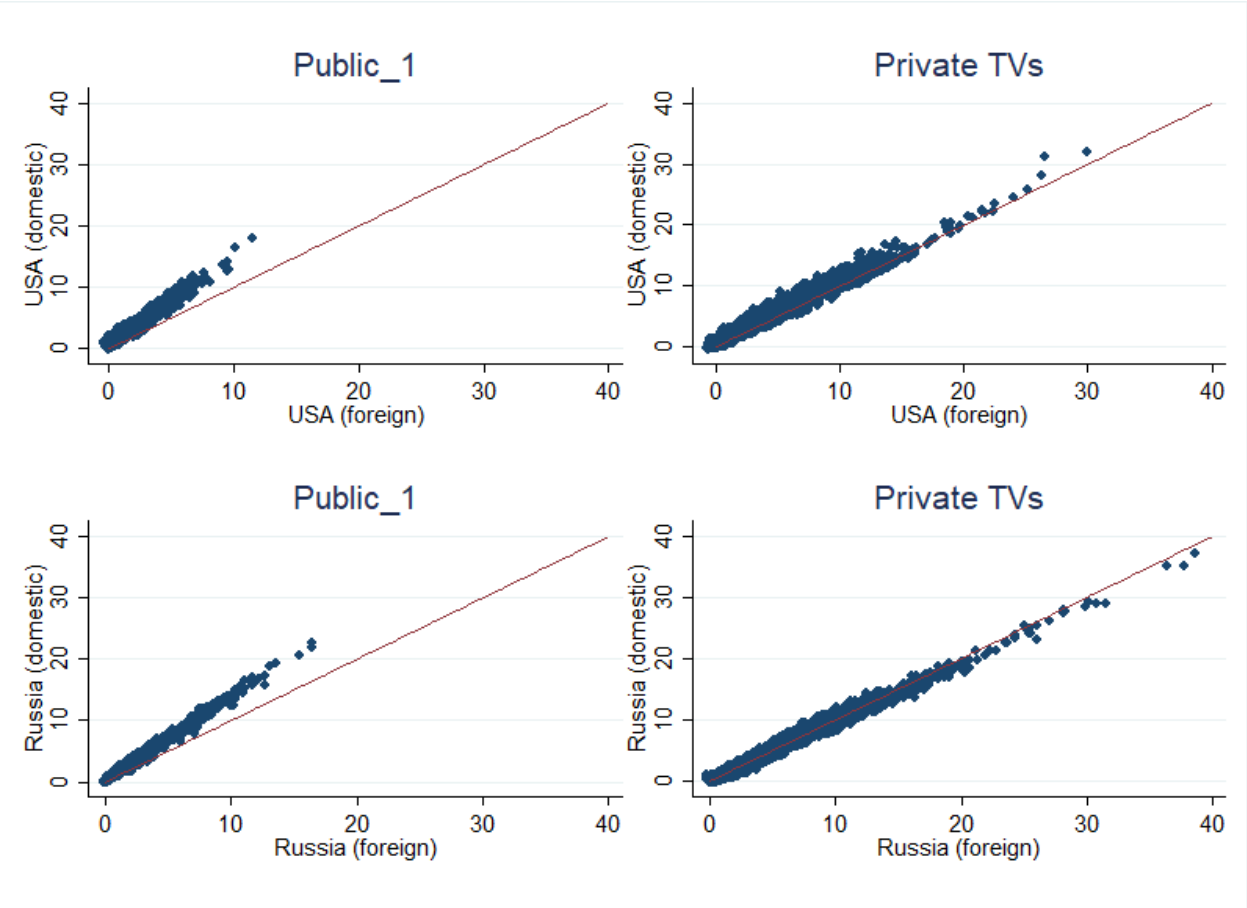

*Note.* Popularity is measured by the frequency of web searches using Google Trends. The location is set as Japan and the category is set as news. "北方領土" (Hoppō-ryōdo or Northern Territories) is used for Northern Territories, "真珠湾" (Shinju-wan or Pearl Harbor) is used for Pearl Harbor, and "交通事故" (Kōtsū-jiko or traffic accident) is used for traffic accidents.

Figure 3: Change in the net trust levels for those who trust Public TV more: Treatment versus control




*Note*. The kernel density plot of the dependent variables, conditional on the control variables. The sample includes only those individuals who trust Public TV more than or as much as private broadcasters according to the baseline survey. The dependent variable is the post-experimental net trust level. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; and trust and accuracy measures.

Figure 4: Average closeness to the official statements interacted with individuals' viewing time




*Note.* These figures plot the closeness to the official statements interacted with individuals' viewing time (AvgExposure in (8)). Each data point represents an individual. The figure shows the results for Public 1 and all private channels. In the top-left panel, the closeness between Public 1's programs and the Japanese government's statement (interacted with duration) (y-axis) is plotted against the closeness between its programs and the US government's statement (interacted with duration) (x-axis), both made when Prime Minister Abe visited Pearl Harbor with President Obama. The top-right panel shows the same, except that closeness is measured for the private channels. Since all five private channels are plotted on the same figure, the number of data points in this panel is five times larger than that in the top-left panel. The bottom panels show the same, except that closeness is measured for the official statements made by the Japanese and Russian governments at the time of the Japan–Russia summit. We use machine learning to compute the closeness measures, where the window size is set to 5, and the vector size is set to 200. See the main text for more details.

# Online Appendix for *Media Trust and Persuasion*

Shuhei Kitamura* Toshifumi Kuroda†

**Abstract**

This Online Appendix includes the tables, figures, and additional analyses that have been excluded from the main text owing to space constraints. The sections are organized as follows. Section A.1 presents the summary statistics. Section A.2 provides the balance tables. Section A.3 discusses an attrition issue. Section A.4 provides additional results. Section A.5 shows the transition of consumer beliefs. Section A.6 describes the selection criteria for each topic. Section A.7 provides examples of the closest words to official statements and examines various cases for formulating the closeness measures. Finally, Section A.8 explains the instructions for the experiment.

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## A.1 Summary Statistics

Table A.1 shows the summary statistics of the main variables.

## A.2 Balance Checks

Table A.2 shows the balance table of the variables of individual characteristics, party support, media use, media trust, and evaluations of public TV programs. It shows the average value for the treatment and control groups as well as the p-value of the difference. Most of the variables are balanced and those variables that are not balanced are included as the baseline control in the analysis in the main text.

## A.3 Attrition Checks

As mentioned in the Data section in the main text, 1,524 individuals (1,280 in the treatment group and 244 in the control group) did not complete the endline survey.

To check the possibility of attrition on the observables, we regress a dummy variable, which takes the value one if an individual does not complete the endline survey, and zero otherwise on the baseline variables in Table A.2. Table A.3 shows the results. First, we find that most variables are statistically insignificant at the 10% level. Most importantly, systematic attrition did not occur with respect to the viewing behavior of Public 1. Second, we find that sex, age, Internet use, and trust in web-based information are relatively strong predictors of attrition. Although these variables are significant, they are balanced in the final sample according to Table A.2. Hence, attrition was not an issue in our analyses.

## A.4 Additional Results

### A.4.1 Plotting raw data

First, Figure A.2 shows the trust level distribution for Public TV and private broadcasters. Second, Figure A.3 plots the change in the evaluation of the government's measures against the Northern Territories dispute. Finally, Figure A.4 illustrates the change in post-experimental net trust levels for those who trusted Public TV more between the treatment and control group.

### A.4.2 Effect by week

Although the main analysis uses the total viewing time as the main outcome, this subsection examines the effect by week. Table A.4 shows the results.[1] The effect appears in all three weeks of the experiment. Moreover, the size of the effects varies little across these weeks, although the effect in Week 2 is slightly larger than those in the other weeks. This finding shows that the first-stage result is not explained by the effect of special daily programs.

### A.4.3 Effect on other TV channels

To understand the overall impact of our treatment, we investigate the effect on other TV channels. We are particularly interested in knowing whether the increase in the viewing time of Public 1 is explained by a decrease in the viewing time of another channel (Channels 2, 4, 6, 8, 10, and 12), holding total viewing time constant, or an increase in total viewing time.

Columns (1)–(7) in the top panel of Table A.5 show the average treatment effects by channel. The dependent variables use the difference in viewing time as in equation (1) in the main text, but for each channel. Column (1) replicates Column (3) in Table 1 in the main text for comparison purposes. As shown in Column (2), the treatment did not increase the viewing time of Channel 2 (henceforth Public 2), another channel broadcast by Public TV. As described in the main text, Public 2 is slightly different from the other channels, as it focuses on educational programs. We also find that it was the least popular channel in our data.[2] These factors might explain why the treatment did not increase the viewing time of Public 2.

Columns (3)–(7) show the treatment effects for all the private broadcasters (which we call Private 4, 6, 8, 10, and 12, respectively, hereafter). We find that the treatment effects for Privates 4 and 12 are negative, although the latter effect is relatively weak. By contrast, the last column of the top panel in Table A.5 shows that the treatment did not affect the total viewing time of TV programs. Taken together, these results indicate that the increase in the viewing time of Public 1 is to some extent explained by the change in the viewing time of private channels, holding total viewing time constant. Using the difference in shares instead of the difference in hours for the dependent variables, the bottom panel of Table A.5 shows a consistent picture; the treatment also increased the share of Public 1 and decreased the share of Private 4. The effect on Private 12 now comes out as insignificant.

[1] Since there is no comparable weekly viewing time before the experiment, viewing time before the experiment is now included as an additional control variable in the regressions.

[2] The average viewing time of Public 2 during the experiment was only about one hour, while that of Public 1 was about 11 hours, as shown in Table A.1.

### A.4.4 Effect of not viewing private TV programs

As shown earlier, Table A.5 indicates some substitution between Public 1 and Private 4. In this subsection, we analyze whether the effect on political evaluations also comes from *not* viewing Private 4. Table A.6 uses the difference in the viewing time of Private 4 instead of Public 1 as the independent variable. The top panel shows the OLS estimates, while the middle panel shows the IV (2SLS) estimates for which we use the treatment dummy as the instrument.

According to the table, the OLS estimates for the evaluation of the government's capability to implement policies and on Prime Minister Abe's visit to Pearl Harbor are positive and statistically significant; however, these estimates are most likely to be biased because of endogeneity. By contrast, the IV estimates are significant only for the evaluation of the government's measures against the Northern Territories dispute, although the effect is relatively weak. Moreover, the sign of all the IV estimates becomes negative. Because the F-statistic is smaller than the conventional level, weak instrument robust inference is also conducted. The corresponding confidence interval in Column (3) indicates that the true effect is likely to be smaller than zero. Since we know from Table A.5 that the treatment seemed to *decrease* the viewing time of Private 4, the negative sign indicates that the positive evaluation of the Northern Territories issue may also come from *not* viewing Private 4 to some degree. However, in Section A.7.5, we present evidence that the result of the positive evaluation is most likely due to viewing Public 1 more rather than viewing Private 4 less.

### A.4.5 Heterogeneous effects

Here, we examine heterogeneous effects with respect to political preferences. We consider two types of variables: supporting a certain political party (i.e., the Liberal Democratic Party (conservative) or the Democratic Party (liberal)) and reading a certain slanted newspaper (Yomiuri (conservative) or Asahi (liberal)). To create an interaction variable, we interact the respective indicator variables with the treatment variable.

Table A.7 shows the first-stage results. None of the interaction terms are statistically significant. Thus, we conclude that the results in the main text cannot be explained by political preferences.

### A.4.6 Effect of program recommendations

In addition to the main experiment, we sent program recommendations every Friday to examine whether they would alter the individual's response. This subsection examines the effect of this

second experiment.

We used two sub-experiments to evaluate the role of program recommendations. In the first sub-experiment, the treatment group in the main experiment was randomly divided into two subgroups: a group receiving program recommendations for programs broadcast by Public Channel 1 (henceforth Public 1) (treatment) and a group not receiving them (control). This sub-experiment aimed to capture the effect of program recommendations.

In the second sub-experiment, we divided the sample of this treatment group into two subgroups: a group receiving the program recommendations with additional information on the content of programs (treatment) and a group receiving them without such information (control). The motivation behind this second sub-experiment was to examine the role of relatively rich information on program recommendations.

Figure A.1 shows examples of program recommendations. The recommendation in the top panel was used for the control group in the second sub-experiment, while the recommendation in the bottom panel was used for the treatment group in the second sub-experiment. It shows that the bottom panel includes an additional row, which briefly explains the content of the programs.

### A.4.7 Balance tables

Table A.8 shows the balance table for the first sub-experiment, which is similar to Table A.2, but using only the sample in the treatment group in the main experiment. It shows that most variables are balanced. The unbalanced variables are included as control variables in the following analysis.

By contrast, Table A.9 is the balance table for the second sub-experiment. Again, most of the variables are balanced. We include unbalanced variables as control variables in the following analysis.

### A.4.8 Results

Table A.10 shows the effect of program recommendations on watching Public 1; Columns (1)–(3) show the results for the first sub-experiment, while Columns (4)–(6) show the results for the second sub-experiment. Similar to Table 2 in the main text, the first columns for each experiment (Columns (1) and (4)) do not include control variables, the second columns (Columns (2) and (5)) include them, and the last columns (Columns (3) and (6)) drop individuals who occasionally failed to report the viewing records of certain programs, although they were likely to have watched them according to the access log. Overall, the insignificant results in all the columns indicate that the

effect of program recommendations are not statistically different from zero.

Because we have access logs for individuals in the treatment group in the main experiment, we also conduct a similar exercise using the log data.

Table A.11 shows the results. The control variables are the same as those in Table A.10. The first two columns examine the effect of program recommendations and recommendations with additional information, respectively on the viewing time of Public 1 using the log data. As expected, the effect is not significantly different from zero.

Columns (3)–(6) in Table A.11 use the dummy variable, which takes the value one if the individual watches Public 1 for at least one minute and zero otherwise, as the dependent variables. The results in Columns (3) and (4) indicate that program recommendations increased the likelihood of watching Public 1, according to both the linear probability model (Column (3)) and the probit model (Column (4)). By contrast, no effect was detected for providing additional information on program advertisements.

Taken together, the effect of program recommendations seems to be null or limited in our sample.

## A.5 Media Trust and Beliefs

In this section, we show that trust levels are likely to be positively correlated with beliefs regarding TV contents ($\frac{\partial C^e_{ijt}}{\partial \text{trust}_{ijt}} > 0$). To do so, we impose a distributional assumption on the model in the main text such that consumers have a uniform prior:

$$C^e_{ij1} \sim U(W^L_{ij1}, W^H_{ij1}), \tag{1}$$

where $W^L_{ij1}$ and $W^H_{ij1}$ have a bilateral bivariate Pareto distribution with the parameters $r^L_{ijt}$, $r^H_{ijt}$, and $\alpha_{ijt}$ such that $r^L_{ij1} < r^H_{ij1}$ and $\alpha_{ij1} > 0$.

From Theorem 2 in Section 9.7 in DeGroot (2004), a consumer's learning process for period $t \geq 2$ is as follows:

$$r^L_{ijt} = \min\{r^L_{ij1}, I_{ij1} \cdot C_{j1}, \ldots, I_{ijt-1} \cdot C_{jt-1}\}, \tag{2}$$

$$r^H_{ijt} = \max\{r^H_{ij1}, I_{ij1} \cdot C_{j1}, \ldots, I_{ijt-1} \cdot C_{jt-1}\}, \quad \text{and} \tag{3}$$

$$\alpha_{ijt} = \alpha_{ij1} + \sum_{\tau=1}^{t-1} I_{ij\tau}. \tag{4}$$

The estimates of the average of the upper and lower bounds are $E(W_{ijt}^H) = \frac{\alpha_{ijt}}{\alpha_{ijt}-1} r_{ijt}^H$ and $E(W_{ijt}^L) = \frac{\alpha_{ijt}}{\alpha_{ijt}-1} r_{ijt}^L$, respectively. Therefore, we obtain

$$C_{ijt}^e = E\left(\frac{W_{ijt}^H + W_{ijt}^L}{2}\right) = \frac{\alpha_{ijt}}{\alpha_{ijt}-1}\frac{r_{ijt}^H + r_{ijt}^L}{2}, \tag{5}$$

which is the belief in the program's contents.

Because we do not have data on the initial beliefs, we assume that $\alpha_{ij1} = \infty$ so that $\alpha_{ijt}/(\alpha_{ijt}-1)$ becomes one for all $t$.

Next, we compute beliefs using individuals' viewing record of Public 1 and Private 4. The transition in computed beliefs is shown in Figure A.8. We discover two patterns. First, computed beliefs tend to be higher for Public 1 than Private 4. This means that individuals tend to believe that Public 1's content is closer to the government than the private broadcaster's content. Second, the beliefs are higher for those who trust either type of media more. In other words, individuals who have more trust in Public TV believe that Public 1's contents are closer to the government, while those with more trust in private broadcasters believe that Private 4's contents are closer to the government. This result indicates that trust and belief levels are more likely to be positively correlated.

## A.6 Selection Criteria for Each Topic

The TV programs in our data are categorized into three topics: (a) Prime Minister Shinzō Abe (henceforth PM topic), (b) the relationship between the United States and Japan (henceforth USA topic), and (c) the relationship between Russia and Japan (henceforth Russia topic). This section describes the selection criteria for each topic. We intentionally set relatively general selection criteria to avoid the risk of excluding relevant programs. After selecting the programs, we checked their content to avoid including irrelevant programs.

For (a), we first selected those programs that contain words related to Prime Minister Shinzō Abe. For a program to be categorized as the PM topic, the program should contain "安倍" (Abe) and at least one of the following words: "首相" (Prime Minister), "総理" (Prime Minister), "総裁" (party president), "内閣" (cabinet), "政権" (administration), "外交" (diplomacy), "日本" (Japan), "晋三" (Shinzō), "安倍氏" (Mr. Abe), or "安倍さん" (Mr. Abe) These words tend to co-occur in a sentence by forming a compound word such as "安倍首相" (Prime Minister Abe).[3]

[3] Including relatively general compound words such as "安倍氏" (Mr. Abe) and "安倍さん" (Mr. Abe) in the

For (b), we first split the words into three themes: America, Pearl Harbor Visit, and World War II. Prime Minister Abe and President Obama visited Pearl Harbor in December 2016. For a program to be categorized as the USA topic, it should contain at least one word from both (i) *and* (ii), from both (i) *and* (iii), or from (iv) according to the following list:[4]

(i) America: "アメリカ" (America), "米国" (America), "米大統領" (American President), "オバマ" (Obama), "日米" (Japan–America).

(ii) World War II: "第二次大戦" (World War II), "第二次世界大戦" (World War II), "太平洋戦争" (The Pacific War), "日本軍" (The Japanese Army), "開戦" (outbreak of war), "終戦" (end of war), "敗戦" (losing a war), "７５年" (75 years).

(iii) Pearl Harbor Visit: "追悼" (mourning), "慰霊" (memorial), "式典" (ceremony), "戦没者" (war dead), "献花" (offering of flowers), "ハワイ" (Hawaii), "オアフ島" (Oahu Island), "ホノルル" (Honolulu), "フォード島" (Ford Island).

(iv) Pearl Harbor Visit: "真珠湾" (Pearl Harbor), "パールハーバー" (Pearl Harbor), "パール・ハーバー" (Pearl Harbor), "アリゾナメモリアル" (Arizona Memorial), "アリゾナ・メモリアル" (Arizona Memorial), "アリゾナ記念館" (Arizona Memorial), "戦艦アリゾナ" (Battleship Arizona), "戦艦ミズーリ" (Battleship Missouri).

Words related to the Pearl Harbor Visit were split into two groups: (iii) a set of words that need an additional word to be categorized as the Pearl Harbor Visit (e.g., "式典" (ceremony) may just mean a ceremony unrelated to the Pearl Harbor Visit) and (iv) a set of words directly related to Pearl Harbor.

For (c), we first split the words into three themes; Russia, the Japan–Russia Summit, and the Northern Territories issue. The Summit took place in Nagato, a city in the Yamaguchi Prefecture, and in Tokyo in December 2016. President Putin landed at the Yamaguchi Ube Airport on December 15. For a program to be categorized as the Russia topic, it should contain at least one word from both (i) *and* (ii), from both (i) *and* (iii), or from (iv) according to the following list:

(i) Russia: "ロシア" (Russia), "露西亜" (Russia), "ソ連" (Soviet), "ソビエト" (Soviet), "露大統領" (Russian President), "プーチン" (Putin), "日ロ" (Japan–Russia), "日露" (Japan–Russia).

list aims to select programs that contain "Mr. Abe." We found only one program containing "Mr. Abe" that was not the Prime Minister (Abe is a relatively common last name) and excluded that program from the PM topic.

[4] We used Google Translate for the translation. If a word was incorrectly translated, we corrected it manually.

(ii) Japan–Russia Summit: “会談” (meeting), “交渉” (negotiation), “首脳” (leaders), “来日” (visiting Japan), “長門” (Nagato), “宇部” (Ube), “山口” (Yamaguchi).

(iii) Northern Territories dispute: “領土問題” (territorial dispute), “四島” (four islands), “４島” (four islands), “二島” (two islands), “２島” (two islands), “返還” (return).

(iv) Northern Territories dispute: “北方領土” (Northern Territories), “北方四島” (Four Northern Islands), “北方４島” (Four Northern Islands), “南クリル” (South Kuril Islands), “色丹” (Shikotan), “択捉” (Etorofu), “歯舞” (Habomai), “平和条約” (Peace Treaty), “日ソ共同宣言” (The Japan–Soviet Joint Declaration), “５６年宣言” (The Declaration of 1956), “５６年の宣言” (The Declaration of 1956).

The words related to the Northern Territories dispute were split into two groups: (iii) a set of words that needed an additional word to be categorized as the Northern Territories dispute (e.g., “四島” (four islands) without “北方” (Northern) could just mean four islands unrelated to the Northern Territories) and (iv) a set of words directly related to the Northern Territories dispute.

## A.7 The Similarity Measure

### A.7.1 Formal explanation of our algorithm

Let $\mathscr{D} = \{D_1, ..., D_K\}$ be a set of documents (TV programs) used to train a machine and $\mathbf{X}$ be a vector of all the words in a training corpus, with length $n$. Each document $D_k$ contains a sequence of words. Let $x_i \in \mathbf{X}$ be a target word and $\mathbf{c}_i^k \in \{0,1\}^{n\times 1}$ be the local context $x_{i-s}, ..., x_{i-1}, x_{i+1}, ..., x_{i+s}$ of the target, where $s$ is the maximum window size, given the sequence of words in document $D_k$. Each element $c_{ij}^k$ of the vector takes the value one if word position $j$ in $\mathbf{X}$ appears in the local context of $x_i$ and zero otherwise.

Next, denote $\mathbf{P} \in \mathbb{R}^{h\times n}$ as the projection matrix from an input to a hidden space of length $h$ and $\mathbf{P}^T \in \mathbb{R}^{n\times h}$ as the projection matrix from the hidden space to an output, where $\mathbf{p}_x$ is the column of $\mathbf{P}$ for word $x$.

Finally, let $\mathbf{D} \in \mathbb{R}^{h\times K}$ be a matrix in which each column represents the memory of the document and $\mathbf{d}^k$ be a column of $\mathbf{D}$, which represents a memory of document $D_k$.

Using a softmax function, the probability of observing the target word $x_i$ in document $D_k$ given the local context $\mathbf{c}_i^k$ and memory $\mathbf{d}^k$ is

$$P(x_i|\mathbf{c}_i^k, \mathbf{d}^k) = \frac{\exp(\mathbf{p}_{x_i}^T(\mathbf{P}\mathbf{c}_i^k + \mathbf{d}^k))}{\sum_{x\in\mathbf{X}} \exp(\mathbf{p}_x^T(\mathbf{P}\mathbf{c}_i^k + \mathbf{d}^k))}. \tag{6}$$

Then, the projection matrices are trained using stochastic gradient descent (where gradient is obtained via backpropagation) to minimize the loss function:

$$-\sum_{k=1}^{K}\sum_{i=1}^{I_k}\log P(x_i|\mathbf{c}_i^k,\mathbf{d}^k). \tag{7}$$

Given the trained $\mathbf{P}$, one can compute $\mathbf{d}^k$ by taking the average of the columns in $\mathbf{P}$ of the words included in document $D_k$.[5]

Suppose two documents each contain a single sentence: "I have a cat" and "I have a dog". Thus, $\dim \mathscr{D} = 2$ and $\mathbf{X} = (\text{dog}, \text{cat}, \text{a}, \text{have}, \text{I})^T$ without loss of generality. Let the window size and vector size be $s = 1$ and $h = 2$, respectively.

The sentence "I have a cat" has a sequence of words: "I," "have," "a," and "cat." The local context of "a," given the window size 1, is therefore "have" and "cat." Hence, $c_3^1$ is written as $(0,1,0,1,0)^T$. Similarly, the local context of "a" in the sentence "I have a dog" has $c_3^2 = (1,0,0,1,0)^T$. These local contexts of the "a"'s are projected onto a two-dimensional hidden space using matrix $P$ and then onto an output using matrix $P^T$. These matrices are constantly updated in the training process so that "a" can be predicted with a high probability.

When the training is finished, words with similar semantics can be mapped to a similar location in the vector space. For tractability, one can typically evaluate the similarity between words $x_i$ and $x_j$ using cosine similarity $(\mathbf{q}_{x_i} \cdot \mathbf{q}_{x_j})/(\|\mathbf{q}_{x_i}\| \times \|\mathbf{q}_{x_j}\|)$.

Applying the same method to measure the semantic similarity between documents, we compute the semantic similarity between documents $D_k$ and $D_l$ using $(\mu_k \cdot \mu_l)/(\|\mu_k\| \times \|\mu_l\|)$, where $\mu_m$ is the average of the semantic vectors of the words contained in document $D_m$, treating duplicates as separate words. Therefore, we assume that the semantics of a document are represented by the average semantics of words in that document. We check this assumption when we set the parameter values.

The algorithm requires researchers to decide two parameters: window size (i.e., how many words are considered together in the moving window on texts, or $s$ in the model) and vector size (i.e., how many dimensions are considered to capture the complex meanings of each word, or $h$ in the model). To obtain the baseline numbers for these parameters, we compute the percentage of the closest programs to the official statements that can be categorized as either the USA or Russia topic to see how much we can successfully predict the relevant programs.

In particular, we first list the TV programs and order them from the most to the least close

[5] In practice, Le and Mikolov (2014) use hirerchical softmax to speed up the process. See also Rong (2016).

to each statement for each event. We then select several programs from the closest programs and check the percentage that can be categorized as either the USA or Russia topic.[6] Thus, a higher percentage means that we are more successful at predicting the relevant programs for each topic. We choose the top 7, 35, and 70 closest programs, which roughly correspond to 1%, 5%, and 10% of all TV programs in the data.

We start by using two window sizes (i.e., 5 and 15) for the moving window. Figure A.5 plots a figure for a window size of 15 and Figure A.6 plots a figure for a window size of 5. In both, the left figures use the closeness to the Japanese government's statement (top) and the US government's statement (bottom). By contrast, the right figures use the closeness to the Japanese government's statement (top) and the Russian government's statement (bottom).

These figures show that the machine with a window size of 15 is worse at predicting programs for the USA topic, particularly when we use the closeness to the official US government statement. In addition, Figure A.6, which uses a window size of 5, shows that the percentage roughly decreases as the vector size increases for the top 7 programs if we use the closeness to the official Japanese government statement, while it increases for the top 7 programs if we use the closeness to the official US government statement, with the lowest hit when the vector size is 100.

Based on these analyses, we select a window size of 5 and a vector size of 200 for the main analysis. Section A.7.3 provides the results using the other parameter values.

### A.7.2 Example of words

This subsection shows an example of the closest words to official statements used in the main analysis. Table A.12 shows the top 10 words that appear in the corpus at least 10 times and that are the closest to the official statement made by the Japanese and US governments. First, most words are highly related to Pearl Harbor, military, and war, which validates the use of our closeness measures. However, a few words do not necessarily seem to be related to the topic. This is particularly the case when closeness is measured between the content of private broadcasters' programs and Japanese official statements. This might be because the Japanese government's statement contains more abstract and poetic expressions. Finally, there are some differences between Public 1 and private broadcasters. For example, "パールハーバー" (Pearl Harbor) appears only for private broadcasting.

Similarly, Table A.13 shows the top 10 closest words to the official statement made by the Japanese and Russian governments when President Putin visited Japan for the summit. First,

[6] See Section A.6 for the procedure of categorizing programs into these topics.

similar to the previous table, most words are highly related to the Northern Territories dispute and the Japan–Russia relationship. The number of seemingly unrelated words is also fewer in this case. Lastly, there are some differences between Public 1 and private broadcasting. For example, "経済連携協定" (Economic Partnership Agreement) appears only for Public 1. A possible explanation could be that the government might have wanted to stress the achievement of the summit (i.e., an agreement with Russia on economic cooperation).

### A.7.3 Alternative vector size

The analysis in the main text uses a vector size of 200. This subsection analyzes an alternative vector size. Table A.14 shows the difference in average closeness to official statements, similar to Table 6 in the main text but with 100, instead of 200, vectors. As before, Public 1's information is closer to the domestic government than to the foreign government compared with private broadcasters' information. Moreover, the difference between Japan and Russia is larger than the difference between Japan and the United States.

Columns (1)–(3) in Table A.15 show the first-stage results using these alternative closeness measures. The results are similar to before: treated individuals were more exposed to information provided by the domestic government. Columns (4)–(6) in the same table show the effect on political evaluations using the alternative vector size. Again, the results are qualitatively similar to the results in the main analysis.

### A.7.4 Excluding low frequency words

Since there are many low frequency words in the training data, this subsection examines the case in which these words are dropped from the data. Figure A.7 plots the percentage of TV programs categorized as either the USA or the Russia topic for those closest to official statements, similar to Figure 6 in the main text, but using only words that appear at least 50 times in the corpus. The figures appear to be similar to each other. The machine is better at predicting programs categorized as the Russia topic than programs categorized as the USA topic, which we also observe in Figure 6 in the main text.

Table A.16 shows the difference in average closeness to official statements, similar to Table 6 in the main text but dropping low frequency words. The difference is still positive and statistically significant.

Columns (1)–(3) in Table A.17 show the first-stage results and Columns (3)–(6) in the same

table show the effect on political evaluations using these alternative measures. Overall, the results are similar to the ones in the main analysis.

It is hard to say which method performs better given these results. Moreover, the definition of "low frequency" can be ad hoc. Therefore, we decided to use the full sample in the main analysis.

### A.7.5 Using Private 4

Because of the (albeit weak) second-stage effect through Private 4 shown in Section A.4.4, we also examine whether the effect on the political evaluation also comes from *not* being exposed to information closer to that provided by the foreign government. To check this possibility, we formulate closeness measures for Private 4 using the same procedure. The bottom panel of Table A.18 shows the first-stage estimates of regressing these measures on the treatment dummy. The table does not present clear evidence that the treatment induced individuals *not* exposed to information closer to that of the foreign government. Compared with the top panel in the same table, the estimates are also relatively small. This is not surprising given that individuals do not seem to be exposed to the slanted information through Private 4, as shown in Figure 4 in the main text.

Thus, the positive evaluation of the Northern Territories issue is more likely to be explained by viewers being exposed *more* to information closer to that provided by the domestic government rather than being exposed *less* to information closer to that provided by the foreign government.

### A.7.6 Closeness to party speeches

In the main analysis, we measure the semantic similarity between TV programs and the official statements made by domestic and foreign governments and find that the positive evaluation of foreign policies is caused by the feature that public media's information is slanted toward the domestic government rather than the foreign government.

Another hypothesis could be that public media's information might be slanted toward the ruling party rather than the opposition party and that treated individuals might have been exposed to such information. The difference between this hypothesis and the hypothesis in the main analysis is that the former reflects the competition between political parties within a country, while the latter is related to national identity. The latter hypothesis does not necessarily rule out the former, however. Further, it might be difficult to distinguish between these hypotheses if information in favor of the domestic government is also emphasized by the ruling party.

To check whether political competition explains our findings, we measure the semantic similarity

between TV programs and party speeches made by the major ruling party (Liberal Democratic Party, henceforth LDP) and the major opposition party (Democratic Party, henceforth DP) in this subsection. To make the results more comparable, we focus on party speeches on the relationship with Russia in the Foreign Affairs Committee meetings in the 192nd Diet (September 26–December 14, 2016).[7] We searched the minutes of the meetings that contain "ロシア" (Russia) using the database of the minutes of the Diet.[8] The database has three meetings, namely those held on October 14, October 26, and November 4, from which we obtained the speeches made by the party members of the LDP and DP. Finally, the procedure for measuring semantic similarity is the same as described in the main text.

Table A.19 shows the supply-side results. This table is similar to Table 6 in the main text but uses the semantic similarity to the party speeches instead of official statements. The table shows that all values are positive and statistically significant, meaning that Public 1's information is closer to the major ruling party than the major opposition party compared with private channels' information.

Next, we construct the average exposure variable as in the main analysis using the alternative closeness variable and regress it on the treatment dummy to check whether the treated group was exposed more to information favoring the ruling party than the opposition party compared with the control group. Interestingly, Table A.20 shows no significant result, which contrasts with the top panel in Table 7 in the main text.

Thus, although we do find that public media's information seems to be slanted toward the ruling party compared with private media's information, this cannot explain the increase in the positive evaluation of foreign policies found in the main analysis. Therefore, the positive evaluation of foreign policies seems to be driven by information related to national identity (domestic vs. foreign) rather than political competition (ruling vs. opposition).

## A.8 Instructions for the Experiment

Figure A.9 shows the original instructions sent by the survey company at the time of recruitment. Figure A.10 presents their translation in English.

[7] Recall that the experiment took place between November 14 and December 18, 2016.
[8] http://kokkai.ndl.go.jp/.

## References

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# Tables and Figures

Table A.1: Summary statistics

| | Mean | Std. Dev. | Min | Max | Obs. |
|---|---|---|---|---|---|
| Total view during the experiment (hour) | | | | | |
| Public_1 | 11.03 | 19.87 | 0.00 | 174.55 | 4452 |
| Public_2 | 1.03 | 3.86 | 0.00 | 74.22 | 4452 |
| Private_4 | 25.23 | 33.38 | 0.00 | 413.88 | 4452 |
| Private_6 | 17.03 | 23.02 | 0.00 | 309.90 | 4452 |
| Private_8 | 16.77 | 25.94 | 0.00 | 230.25 | 4452 |
| Private_10 | 22.26 | 28.68 | 0.00 | 362.97 | 4452 |
| Private_12 | 6.01 | 9.34 | 0.00 | 130.12 | 4452 |
| Difference in total view | | | | | |
| Δ Public_1 | 0.94 | 8.69 | −44.97 | 116.07 | 4452 |
| Δ Public_2 | 0.24 | 2.14 | −17.37 | 74.22 | 4452 |
| Δ Private_4 | 8.16 | 15.13 | −62.15 | 134.75 | 4452 |
| Δ Private_6 | 5.18 | 11.27 | −66.05 | 123.45 | 4452 |
| Δ Private_8 | 5.79 | 11.76 | −56.00 | 113.37 | 4452 |
| Δ Private_10 | 7.45 | 13.16 | −70.98 | 135.70 | 4452 |
| Δ Private_12 | 1.24 | 4.97 | −34.45 | 41.32 | 4452 |
| Closeness | | | | | |
| Δ Japan-USA | 0.37 | 0.66 | −0.28 | 6.43 | 4452 |
| Δ Japan-Russia | 0.41 | 0.75 | −0.34 | 6.26 | 4452 |
| Treatment | | | | | |
| Treatment | 0.83 | 0.37 | 0.00 | 1.00 | 4452 |
| Ad. | 0.67 | 0.47 | 0.00 | 1.00 | 4452 |
| Ad. + info. | 0.33 | 0.47 | 0.00 | 1.00 | 4452 |
| Political evaluation | | | | | |
| Gen. eval. | 2.33 | 0.88 | 1.00 | 4.00 | 4452 |
| Pearl Harbor | 6.85 | 2.54 | 0.00 | 10.00 | 4452 |
| North. Terr. | 4.51 | 2.55 | 0.00 | 10.00 | 4452 |

Table A.2: Balance table for the main experiment.

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| Individual characteristics | | | | |
| Age | 47.754 | 47.303 | 0.384 | 4452 |
| | (0.481) | (0.213) | | |
| Female | 0.466 | 0.478 | 0.554 | 4452 |
| | (0.018) | (0.008) | | |
| Education | 14.752 | 14.744 | 0.922 | 4452 |
| | (0.069) | (0.031) | | |
| Annual income | 6.275 | 6.105 | 0.333 | 3926 |
| | (0.170) | (0.072) | | |
| Annual income not reported | 0.092 | 0.124 | 0.013 | 4452 |
| | (0.011) | (0.005) | | |
| Origin (prefecture) | 12.307 | 12.310 | 0.963 | 4452 |
| | (0.057) | (0.027) | | |
| Occupation | 2.851 | 2.798 | 0.504 | 4452 |
| | (0.073) | (0.033) | | |
| Family type | 2.777 | 2.734 | 0.393 | 4452 |
| | (0.046) | (0.021) | | |
| Family size | 2.839 | 2.771 | 0.171 | 4452 |
| | (0.047) | (0.020) | | |
| Public awareness | 2.413 | 2.395 | 0.590 | 4452 |
| | (0.031) | (0.013) | | |
| Policy evaluation | 2.307 | 2.276 | 0.352 | 4452 |
| | (0.030) | (0.013) | | |
| Party support | | | | |
| Liberal-Democrat | 0.288 | 0.243 | 0.009 | 4452 |
| | (0.017) | (0.007) | | |
| Democrat | 0.049 | 0.049 | 0.994 | 4452 |
| | (0.008) | (0.004) | | |
| Komei | 0.019 | 0.019 | 0.991 | 4452 |
| | (0.005) | (0.002) | | |
| Communist | 0.031 | 0.027 | 0.592 | 4452 |
| | (0.006) | (0.003) | | |
| Ishin | 0.023 | 0.023 | 0.946 | 4452 |
| | (0.005) | (0.002) | | |
| Social-Democrat | 0.008 | 0.005 | 0.239 | 4452 |
| | (0.003) | (0.001) | | |
| Other | 0.007 | 0.015 | 0.067 | 4452 |
| | (0.003) | (0.002) | | |
| No party | 0.490 | 0.526 | 0.075 | 4452 |
| | (0.018) | (0.008) | | |
| No answer | 0.086 | 0.094 | 0.504 | 4452 |
| | (0.010) | (0.005) | | |

*Note.* Standard errors are in parentheses.

Balance table for the main experiment (cont.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| TV view freq. (realtime) | | | | |
| Public_1 | 4.643 | 4.540 | 0.320 | 4452 |
| | (0.094) | (0.042) | | |
| Public_2 | 2.984 | 2.986 | 0.985 | 4452 |
| | (0.077) | (0.035) | | |
| Private_4 | 5.495 | 5.421 | 0.367 | 4452 |
| | (0.074) | (0.034) | | |
| Private_6 | 5.337 | 5.249 | 0.278 | 4452 |
| | (0.073) | (0.034) | | |
| Private_8 | 5.113 | 5.092 | 0.805 | 4452 |
| | (0.076) | (0.035) | | |
| Private_10 | 5.359 | 5.333 | 0.751 | 4452 |
| | (0.074) | (0.034) | | |
| Private_12 | 4.883 | 4.846 | 0.658 | 4452 |
| | (0.075) | (0.034) | | |
| TV view freq. (recorded) | | | | |
| Public_1 | 2.615 | 2.657 | 0.615 | 4452 |
| | (0.077) | (0.034) | | |
| Public_2 | 2.013 | 2.114 | 0.148 | 4452 |
| | (0.061) | (0.029) | | |
| Private_4 | 3.323 | 3.442 | 0.177 | 4452 |
| | (0.080) | (0.036) | | |
| Private_6 | 3.345 | 3.354 | 0.924 | 4452 |
| | (0.080) | (0.036) | | |
| Private_8 | 3.216 | 3.273 | 0.513 | 4452 |
| | (0.079) | (0.036) | | |
| Private_10 | 3.352 | 3.405 | 0.546 | 4452 |
| | (0.080) | (0.036) | | |
| Private_12 | 3.076 | 3.154 | 0.358 | 4452 |
| | (0.077) | (0.035) | | |
| Internet use | | | | |
| Weekdays (duration) | 4.574 | 4.507 | 0.403 | 4434 |
| | (0.072) | (0.033) | | |
| Holidays (duration) | 4.893 | 4.913 | 0.814 | 4429 |
| | (0.076) | (0.035) | | |
| On mobile phones (freq.) | 4.081 | 4.058 | 0.804 | 4452 |
| | (0.083) | (0.037) | | |

*Note.* Standard errors are in parentheses.

Balance table for the main experiment (cont.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| Reading newspaper | | | | |
| Yomiuri | 0.248 | 0.245 | 0.868 | 4452 |
| | (0.016) | (0.007) | | |
| Asahi | 0.205 | 0.203 | 0.926 | 4452 |
| | (0.015) | (0.007) | | |
| Mainichi | 0.040 | 0.037 | 0.712 | 4452 |
| | (0.007) | (0.003) | | |
| Sankei | 0.049 | 0.036 | 0.093 | 4452 |
| | (0.008) | (0.003) | | |
| Nikkei | 0.151 | 0.145 | 0.660 | 4452 |
| | (0.013) | (0.006) | | |
| Sport | 0.037 | 0.031 | 0.365 | 4452 |
| | (0.007) | (0.003) | | |
| Local | 0.052 | 0.054 | 0.778 | 4452 |
| | (0.008) | (0.004) | | |
| Other | 0.009 | 0.011 | 0.665 | 4452 |
| | (0.003) | (0.002) | | |
| Not reading | 0.384 | 0.380 | 0.860 | 4452 |
| | (0.018) | (0.008) | | |
| Media trust | | | | |
| Public TV | 3.048 | 2.984 | 0.030 | 4452 |
| | (0.026) | (0.012) | | |
| Private channels | 2.829 | 2.796 | 0.227 | 4452 |
| | (0.025) | (0.011) | | |
| Newspaper | 2.956 | 2.908 | 0.081 | 4452 |
| | (0.025) | (0.011) | | |
| Publication | 2.580 | 2.556 | 0.370 | 4452 |
| | (0.025) | (0.011) | | |
| Internet | 2.469 | 2.424 | 0.114 | 4452 |
| | (0.026) | (0.012) | | |
| Evaluation on Public TV programs | | | | |
| Accuracy | 2.822 | 2.749 | 0.041 | 4452 |
| | (0.032) | (0.015) | | |
| Fairness | 2.493 | 2.447 | 0.188 | 4452 |
| | (0.031) | (0.014) | | |
| Observations | 753 | 3699 | | 4452 |

*Note.* Standard errors are in parentheses.

Table A.3: Probit estimates of the attrition dummy on the covariates.

| | | Coef. | S.E. |
|---|---|---|---|
| Individual characteristics | Age | −0.016 | (0.002)*** |
| | Female | 0.199 | (0.044)*** |
| | Education | −0.014 | (0.011) |
| | Annual income | −0.006 | (0.006) |
| | Origin (Prefecture) | −0.014 | (0.012) |
| | Occupation | 0.022 | (0.011)* |
| | Family type | 0.003 | (0.021) |
| | Family size | −0.004 | (0.022) |
| | Public awareness | 0.084 | (0.025)*** |
| | Policy evaluation | −0.037 | (0.029) |
| Party support | Liberal-Democrat | 0.304 | (0.185) |
| | Democrat | 0.118 | (0.204) |
| | Komei | 0.381 | (0.224)* |
| | Communist | 0.243 | (0.213) |
| | Ishin | 0.015 | (0.228) |
| | Social-Democrat | −0.275 | (0.388) |
| | No party | 0.059 | (0.184) |
| | No answer | 0.243 | (0.192) |
| TV view freq. (realtime) | Public_1 | −0.011 | (0.012) |
| | Public_2 | 0.024 | (0.013)* |
| | Private_4 | −0.014 | (0.021) |
| | Private_6 | 0.044 | (0.025)* |
| | Private_8 | 0.004 | (0.019) |
| | Private_10 | −0.009 | (0.022) |
| | Private_12 | −0.012 | (0.017) |
| TV view freq. (recorded) | Public_1 | −0.006 | (0.014) |
| | Public_2 | −0.018 | (0.017) |
| | Private_4 | −0.012 | (0.022) |
| | Private_6 | −0.019 | (0.026) |
| | Private_8 | −0.001 | (0.024) |
| | Private_10 | 0.014 | (0.022) |
| | Private_12 | 0.023 | (0.017) |
| Internet use | Weekdays (duration) | −0.069 | (0.016)*** |
| | Holidays (duration) | 0.053 | (0.015)*** |
| | On mobile phones (freq.) | 0.053 | (0.010)*** |
| Reading newspaper | Yomiuri | −0.044 | (0.065) |
| | Asahi | −0.017 | (0.067) |
| | Mainichi | −0.065 | (0.112) |
| | Sankei | −0.033 | (0.108) |
| | Nikkei | 0.047 | (0.068) |
| | Sport | 0.058 | (0.114) |
| | Local | 0.162 | (0.095)* |
| | Other | −0.197 | (0.206) |
| | Not reading | 0.081 | (0.071) |
| Media trust | Public TV | 0.048 | (0.042) |
| | Private channels | −0.068 | (0.046) |
| | Newspaper | 0.068 | (0.044) |
| | Publication | −0.026 | (0.040) |
| | Internet | −0.084 | (0.035)** |
| Evaluation on Public TV programs | Accuracy | 0.001 | (0.033) |
| | Fairness | −0.021 | (0.034) |
| | Constant | −0.031 | (0.330) |
| | Observations | 4983 | |

*Note.* Standard errors are in parentheses. A dummy for not reporting annual income and for supporting another party were dropped because of collinearity. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.4: The average treatment effect on watching Public 1, by week

| | Dependent variable: Public_1 | | |
|---|---|---|---|
| | (1) Week 1 | (2) Week 2 | (3) Week 3 |
| Treatment | 0.300 | 0.420 | 0.321 |
| | (0.125)** | (0.125)*** | (0.125)** |
| Controls | Yes | Yes | Yes |
| Mean of control | 3.72 | 3.36 | 3.47 |
| $R^2$ | 0.80 | 0.78 | 0.77 |
| Observations | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables are the weekly viewing time of Public 1 during the experiment (in hours). Week 1: November 28–December 4, Week 2: December 5–11, and Week 3: December 12–18. "Treatment" is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.5: The average treatment effect on watching TV programs, by channel

| | Dependent variable: Δ TV view | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) Public_1 | (2) Public_2 | (3) Private_4 | (4) Private_6 | (5) Private_8 | (6) Private_10 | (7) Private_12 | (8) All |
| Level | | | | | | | | |
| Treatment | 1.082 | −0.028 | −1.538 | −0.513 | −0.237 | −0.409 | −0.355 | −1.999 |
| | (0.336)*** | (0.077) | (0.624)** | (0.463) | (0.462) | (0.548) | (0.209)* | (1.473) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean of control | 0.27 | 0.24 | 9.28 | 5.44 | 5.81 | 7.74 | 1.51 | 30.28 |
| Mean of control (before) | 10.28 | 0.71 | 17.96 | 11.16 | 10.24 | 15.06 | 5.04 | 70.44 |
| Mean of control (during) | 10.54 | 0.95 | 27.23 | 16.60 | 16.05 | 22.80 | 22.80 | 100.72 |
| $R^2$ | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 |
| Observations | 4156 | 4156 | 4156 | 4156 | 4156 | 4156 | 4156 | 4156 |
| Share | | | | | | | | |
| Treatment | 0.014 | −0.001 | −0.010 | −0.006 | −0.001 | 0.003 | 0.001 | |
| | (0.005)*** | (0.001) | (0.005)** | (0.004) | (0.004) | (0.005) | (0.003) | |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Mean of control | -0.04 | 0.00 | 0.02 | 0.01 | 0.01 | 0.01 | -0.01 | |
| Mean of control (before) | 0.18 | 0.01 | 0.24 | 0.15 | 0.14 | 0.21 | 0.08 | |
| Mean of control (during) | 0.14 | 0.01 | 0.26 | 0.16 | 0.15 | 0.22 | 0.07 | |
| $R^2$ | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Observations | 3934 | 3934 | 3934 | 3934 | 3934 | 3934 | 3934 | |

*Note.* Robust standard errors are in parentheses. The dependent variables are the difference in the viewing time of TV programs before and during the experiment for each channel, except for Column (8) for which the dependent variable uses the total viewing time of all channels (in hours). "Treatment" is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; and trust and accuracy measures. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.6: Effect on political evaluation by not viewing Private 4

| | Dependent variable: Evaluation | | |
|---|---|---|---|
| | (1) Gen. eval. | (2) Pearl Harbor | (3) North. Terr. |
| OLS estimates | | | |
| Δ Private_4 | 0.002 | 0.011 | −0.000 |
| | (0.001)** | (0.002)*** | (0.002) |
| Controls | Yes | Yes | Yes |
| Mean of control | 2.34 | 6.90 | 4.41 |
| $R^2$ | 0.23 | 0.12 | 0.11 |
| Observations | 4156 | 4156 | 4156 |
| IV estimates | | | |
| Δ Private_4 | −0.030 | −0.031 | −0.171 |
| | (0.023) | (0.065) | (0.092)* |
| Controls | Yes | Yes | Yes |
| Mean of control | 2.34 | 6.90 | 4.41 |
| F-stat. | 6.07 | 6.07 | 6.07 |
| Effect. F-stat. | 6.07 | 6.07 | 6.07 |
| p-value (AR) | 0.14 | 0.62 | 0.01 |
| CI (AR) | [-.121, .010] | [-.285, .121] | [-.531,-.051] |
| CI (Wald) | [-.075, .016] | [-.158, .096] | [-.351, .009] |
| Observations | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables are (a) the evaluation of the government's capability ("Do you evaluate that the current government has the capability to implement policies?" (4: Yes, 3: More or less, 2: Not quite, 1: No)) (Column (1)), (b) the evaluation of Prime Minister Abe's visit to Pearl Harbor with President Obama ("How do you evaluate Prime Minister Abe's visit to Pearl Harbor with President Obama?" (0 to 10 points)) (Column (2)), and (c) the evaluation of the government's measures against the Northern Territories dispute ("How do you evaluate the government's measures against the Northern Territories dispute?" (0 to 10 points)) (Column (3)). The IV is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; and trust and accuracy measures. "Effective F-stat." is the effective F-statistic of Olea and Pflueger (2013). We use Stata's `weakivtest` to compute the test statistic. Weak instrument robust inference (Anderson–Rubin (AR) test) is conducted and the corresponding p-values and confidence intervals are reported in rows labeled as "p-value (AR)" and "CI (AR)," respectively. We use Stata's command `rivtest` to compute the test statistic. *, **, and *** indicate $p<0.10$, $p<0.05$, and $p<0.01$, respectively.

Table A.7: Heterogeneous effects on viewing time

| | Dependent variable: Δ Public_1 | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Treatment | 1.139 | 1.104 | 1.099 | 0.793 |
| | (0.400)*** | (0.335)*** | (0.382)*** | (0.339)** |
| × Liberal-Democrat | −0.201 | | | |
| | (0.731) | | | |
| × Democrat | | −0.452 | | |
| | | (2.180) | | |
| × Yomiuri | | | −0.069 | |
| | | | (0.789) | |
| × Asahi | | | | 1.414 |
| | | | | (1.034) |
| Controls | Yes | Yes | Yes | Yes |
| Mean of control | 0.27 | 0.27 | 0.27 | 0.27 |
| $R^2$ | 0.01 | 0.01 | 0.01 | 0.01 |
| Observations | 4156 | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variable is the difference in the viewing time of Public 1 before and during the experiment (in hours). "Liberal-Democrat" ("Democrat") is the interaction between the treatment variable and the party-support dummy, which takes a value of 1 if an individual supports Liberal Democratic Party (Democratic Party). "Yomiuri" ("Asahi") is the interaction between the treatment variable and the dummy for reading certain slanted newspapers. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; and trust and accuracy measures. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.8: Balance table for the second treatment (ad.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| Individual characteristics | | | | |
| Age | 47.525 | 47.248 | 0.605 | 3699 |
| | (0.476) | (0.238) | | |
| Female | 0.475 | 0.479 | 0.877 | 3699 |
| | (0.018) | (0.009) | | |
| Education | 14.817 | 14.726 | 0.245 | 3699 |
| | (0.069) | (0.035) | | |
| Annual income | 6.102 | 6.106 | 0.983 | 3242 |
| | (0.161) | (0.081) | | |
| Annual income not reported | 0.115 | 0.126 | 0.420 | 3699 |
| | (0.012) | (0.006) | | |
| Origin (prefecture) | 12.337 | 12.303 | 0.609 | 3699 |
| | (0.058) | (0.030) | | |
| Occupation | 2.758 | 2.808 | 0.550 | 3699 |
| | (0.073) | (0.037) | | |
| Family type | 2.765 | 2.726 | 0.455 | 3699 |
| | (0.047) | (0.023) | | |
| Family size | 2.805 | 2.763 | 0.415 | 3699 |
| | (0.046) | (0.023) | | |
| Public awareness | 2.377 | 2.400 | 0.503 | 3699 |
| | (0.030) | (0.015) | | |
| Policy evaluation | 2.235 | 2.286 | 0.127 | 3699 |
| | (0.030) | (0.015) | | |
| Party support | | | | |
| Liberal-Democrat | 0.219 | 0.249 | 0.088 | 3699 |
| | (0.015) | (0.008) | | |
| Democrat | 0.056 | 0.048 | 0.342 | 3699 |
| | (0.009) | (0.004) | | |
| Komei | 0.015 | 0.020 | 0.418 | 3699 |
| | (0.004) | (0.003) | | |
| Communist | 0.034 | 0.025 | 0.185 | 3699 |
| | (0.007) | (0.003) | | |
| Ishin | 0.018 | 0.024 | 0.293 | 3699 |
| | (0.005) | (0.003) | | |
| Social-Democrat | 0.001 | 0.005 | 0.149 | 3699 |
| | (0.001) | (0.001) | | |
| Other | 0.014 | 0.016 | 0.715 | 3699 |
| | (0.004) | (0.002) | | |
| No party | 0.545 | 0.521 | 0.237 | 3699 |
| | (0.018) | (0.009) | | |
| No answer | 0.098 | 0.093 | 0.658 | 3699 |
| | (0.011) | (0.005) | | |

*Note.* Standard errors are in parentheses.

Balance table for the second treatment (ad.) (cont.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| TV view freq. (realtime) | | | | |
| Public_1 | 4.493 | 4.552 | 0.580 | 3699 |
| | (0.095) | (0.047) | | |
| Public_2 | 2.959 | 2.992 | 0.707 | 3699 |
| | (0.078) | (0.039) | | |
| Private_4 | 5.437 | 5.417 | 0.815 | 3699 |
| | (0.076) | (0.038) | | |
| Private_6 | 5.249 | 5.249 | 0.996 | 3699 |
| | (0.076) | (0.037) | | |
| Private_8 | 5.117 | 5.086 | 0.717 | 3699 |
| | (0.079) | (0.039) | | |
| Private_10 | 5.343 | 5.330 | 0.879 | 3699 |
| | (0.077) | (0.038) | | |
| Private_12 | 4.825 | 4.852 | 0.757 | 3699 |
| | (0.079) | (0.038) | | |
| TV view freq. (recorded) | | | | |
| Public_1 | 2.668 | 2.654 | 0.869 | 3699 |
| | (0.077) | (0.038) | | |
| Public_2 | 2.066 | 2.125 | 0.406 | 3699 |
| | (0.062) | (0.032) | | |
| Private_4 | 3.436 | 3.444 | 0.930 | 3699 |
| | (0.082) | (0.041) | | |
| Private_6 | 3.320 | 3.362 | 0.640 | 3699 |
| | (0.081) | (0.040) | | |
| Private_8 | 3.279 | 3.272 | 0.941 | 3699 |
| | (0.080) | (0.040) | | |
| Private_10 | 3.407 | 3.404 | 0.977 | 3699 |
| | (0.081) | (0.040) | | |
| Private_12 | 3.143 | 3.157 | 0.881 | 3699 |
| | (0.080) | (0.039) | | |
| Internet use | | | | |
| Weekdays (duration) | 4.447 | 4.522 | 0.363 | 3687 |
| | (0.071) | (0.037) | | |
| Holidays (duration) | 4.833 | 4.932 | 0.257 | 3684 |
| | (0.074) | (0.040) | | |
| On mobile phones (freq.) | 4.060 | 4.058 | 0.982 | 3699 |
| | (0.085) | (0.042) | | |

*Note.* Standard errors are in parentheses.

Balance table for the second treatment (ad.) (cont.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| Reading newspaper | | | | |
| Yomiuri | 0.240 | 0.247 | 0.724 | 3699 |
| | (0.016) | (0.008) | | |
| Asahi | 0.209 | 0.202 | 0.653 | 3699 |
| | (0.015) | (0.007) | | |
| Mainichi | 0.045 | 0.035 | 0.198 | 3699 |
| | (0.008) | (0.003) | | |
| Sankei | 0.046 | 0.034 | 0.098 | 3699 |
| | (0.008) | (0.003) | | |
| Nikkei | 0.139 | 0.147 | 0.617 | 3699 |
| | (0.013) | (0.006) | | |
| Sport | 0.034 | 0.030 | 0.560 | 3699 |
| | (0.007) | (0.003) | | |
| Local | 0.059 | 0.053 | 0.557 | 3699 |
| | (0.009) | (0.004) | | |
| Other | 0.014 | 0.010 | 0.457 | 3699 |
| | (0.004) | (0.002) | | |
| Not reading | 0.380 | 0.381 | 0.971 | 3699 |
| | (0.018) | (0.009) | | |
| Media trust | | | | |
| Public TV | 2.970 | 2.988 | 0.555 | 3699 |
| | (0.027) | (0.013) | | |
| Private channels | 2.775 | 2.801 | 0.332 | 3699 |
| | (0.026) | (0.012) | | |
| Newspaper | 2.889 | 2.912 | 0.421 | 3699 |
| | (0.026) | (0.013) | | |
| Publication | 2.512 | 2.566 | 0.058 | 3699 |
| | (0.026) | (0.013) | | |
| Internet | 2.404 | 2.429 | 0.396 | 3699 |
| | (0.026) | (0.013) | | |
| Evaluation on Public TV programs | | | | |
| Accuracy | 2.708 | 2.759 | 0.171 | 3699 |
| | (0.033) | (0.017) | | |
| Fairness | 2.414 | 2.455 | 0.255 | 3699 |
| | (0.032) | (0.016) | | |
| Observations | 732 | 2967 | | 3699 |

*Note.* Standard errors are in parentheses.

Table A.9: Balance table for the second treatment (ad. + info.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| Individual characteristics | | | | |
| Age | 47.010 | 47.486 | 0.317 | 2967 |
| | (0.335) | (0.337) | | |
| Female | 0.479 | 0.478 | 0.960 | 2967 |
| | (0.013) | (0.013) | | |
| Education | 14.724 | 14.728 | 0.954 | 2967 |
| | (0.049) | (0.049) | | |
| Annual income | 6.189 | 6.022 | 0.303 | 2594 |
| | (0.113) | (0.116) | | |
| Annual income not reported | 0.119 | 0.132 | 0.265 | 2967 |
| | (0.008) | (0.009) | | |
| Origin (prefecture) | 12.280 | 12.325 | 0.455 | 2967 |
| | (0.044) | (0.041) | | |
| Occupation | 2.792 | 2.823 | 0.672 | 2967 |
| | (0.052) | (0.052) | | |
| Family type | 2.721 | 2.731 | 0.829 | 2967 |
| | (0.033) | (0.033) | | |
| Family size | 2.768 | 2.758 | 0.819 | 2967 |
| | (0.032) | (0.032) | | |
| Public awareness | 2.390 | 2.410 | 0.513 | 2967 |
| | (0.021) | (0.021) | | |
| Policy evaluation | 2.270 | 2.303 | 0.280 | 2967 |
| | (0.021) | (0.021) | | |
| Party support | | | | |
| Liberal-Democrat | 0.247 | 0.250 | 0.857 | 2967 |
| | (0.011) | (0.011) | | |
| Democrat | 0.047 | 0.048 | 0.954 | 2967 |
| | (0.006) | (0.006) | | |
| Komei | 0.022 | 0.017 | 0.416 | 2967 |
| | (0.004) | (0.003) | | |
| Communist | 0.026 | 0.025 | 0.891 | 2967 |
| | (0.004) | (0.004) | | |
| Ishin | 0.022 | 0.027 | 0.350 | 2967 |
| | (0.004) | (0.004) | | |
| Social-Democrat | 0.007 | 0.003 | 0.130 | 2967 |
| | (0.002) | (0.002) | | |
| Other | 0.017 | 0.014 | 0.542 | 2967 |
| | (0.003) | (0.003) | | |
| No party | 0.515 | 0.527 | 0.524 | 2967 |
| | (0.013) | (0.013) | | |
| No answer | 0.097 | 0.089 | 0.424 | 2967 |
| | (0.008) | (0.007) | | |

*Note.* Standard errors are in parentheses.

Balance table for the second treatment (ad. + info.) (cont.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| TV view freq. (realtime) | | | | |
| Public_1 | 4.534 | 4.570 | 0.711 | 2967 |
| | (0.067) | (0.067) | | |
| Public_2 | 2.997 | 2.987 | 0.898 | 2967 |
| | (0.056) | (0.056) | | |
| Private_4 | 5.423 | 5.412 | 0.880 | 2967 |
| | (0.053) | (0.053) | | |
| Private_6 | 5.251 | 5.247 | 0.966 | 2967 |
| | (0.053) | (0.053) | | |
| Private_8 | 5.128 | 5.043 | 0.275 | 2967 |
| | (0.055) | (0.056) | | |
| Private_10 | 5.361 | 5.299 | 0.413 | 2967 |
| | (0.052) | (0.054) | | |
| Private_12 | 4.843 | 4.861 | 0.810 | 2967 |
| | (0.053) | (0.054) | | |
| TV view freq. (recorded) | | | | |
| Public_1 | 2.626 | 2.682 | 0.460 | 2967 |
| | (0.054) | (0.054) | | |
| Public_2 | 2.082 | 2.169 | 0.178 | 2967 |
| | (0.045) | (0.046) | | |
| Private_4 | 3.384 | 3.504 | 0.141 | 2967 |
| | (0.057) | (0.058) | | |
| Private_6 | 3.337 | 3.387 | 0.538 | 2967 |
| | (0.056) | (0.057) | | |
| Private_8 | 3.243 | 3.301 | 0.473 | 2967 |
| | (0.056) | (0.057) | | |
| Private_10 | 3.324 | 3.484 | 0.048 | 2967 |
| | (0.057) | (0.057) | | |
| Private_12 | 3.098 | 3.215 | 0.135 | 2967 |
| | (0.055) | (0.056) | | |
| Internet use | | | | |
| Weekdays (duration) | 4.541 | 4.504 | 0.615 | 2956 |
| | (0.053) | (0.052) | | |
| Holidays (duration) | 4.916 | 4.949 | 0.679 | 2954 |
| | (0.056) | (0.056) | | |
| On mobile phones (freq.) | 4.046 | 4.070 | 0.774 | 2967 |
| | (0.059) | (0.059) | | |

*Note.* Standard errors are in parentheses.

Balance table for the second treatment (ad. + info.) (cont.).

| | Control | Treatment | p-value | Obs. |
|---|---|---|---|---|
| Reading newspaper | | | | |
| Yomiuri | 0.243 | 0.251 | 0.601 | 2967 |
| | (0.011) | (0.011) | | |
| Asahi | 0.191 | 0.213 | 0.136 | 2967 |
| | (0.010) | (0.011) | | |
| Mainichi | 0.036 | 0.034 | 0.823 | 2967 |
| | (0.005) | (0.005) | | |
| Sankei | 0.032 | 0.035 | 0.702 | 2967 |
| | (0.005) | (0.005) | | |
| Nikkei | 0.143 | 0.150 | 0.605 | 2967 |
| | (0.009) | (0.009) | | |
| Sport | 0.023 | 0.037 | 0.025 | 2967 |
| | (0.004) | (0.005) | | |
| Local | 0.054 | 0.052 | 0.846 | 2967 |
| | (0.006) | (0.006) | | |
| Other | 0.010 | 0.011 | 0.867 | 2967 |
| | (0.003) | (0.003) | | |
| Not reading | 0.392 | 0.369 | 0.203 | 2967 |
| | (0.013) | (0.013) | | |
| Media trust | | | | |
| Public TV | 2.973 | 3.003 | 0.271 | 2967 |
| | (0.019) | (0.019) | | |
| Private channels | 2.811 | 2.792 | 0.446 | 2967 |
| | (0.017) | (0.017) | | |
| Newspaper | 2.918 | 2.907 | 0.682 | 2967 |
| | (0.018) | (0.018) | | |
| Publication | 2.570 | 2.563 | 0.791 | 2967 |
| | (0.018) | (0.018) | | |
| Internet | 2.434 | 2.424 | 0.676 | 2967 |
| | (0.018) | (0.018) | | |
| Evaluation on Public TV programs | | | | |
| Accuracy | 2.735 | 2.782 | 0.156 | 2967 |
| | (0.024) | (0.023) | | |
| Fairness | 2.431 | 2.479 | 0.137 | 2967 |
| | (0.023) | (0.023) | | |
| Observations | 1480 | 1487 | | 2967 |

*Note.* Standard errors are in parentheses.

Table A.10: The average treatment effect of advertisements on watching Public 1.

| | Dependent variable: Δ Public_1 | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Ad. | 0.396 | 0.407 | 0.501 | | | |
| | (0.364) | (0.363) | (0.379) | | | |
| Ad. + info. | | | | 0.127 | 0.123 | 0.027 |
| | | | | (0.323) | (0.323) | (0.346) |
| Controls | No | Yes | Yes | No | Yes | Yes |
| Mean of control | 0.76 | 0.76 | 0.88 | 1.10 | 1.10 | 1.35 |
| $R^2$ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Observations | 3699 | 3699 | 3403 | 2967 | 2967 | 2704 |

*Note.* Robust standard errors are in parentheses. The dependent variables are the difference in the viewing time of Public 1 before and during the experiment (in hours). "Ad." and "Ad. + info." are the treatment dummies for the first and second sub-experiments, respectively. The control variables for Columns (1)–(3) are a dummy for supporting the LDP and for reading the Sankei newspaper. The control variables for Columns (4)–(6) are the frequency of watching Channel 10 and a dummy for reading sports newspapers. Columns (3) and (6) drop individuals who occasionally failed to report the viewing records of certain programs, although they were likely to have seen them according to the access log. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.11: The average treatment effect of advertisements on watching Public 1 using log data.

| | Dependent variable: TV view | | | | | |
|---|---|---|---|---|---|---|
| | Minutes | | Dummy | | | |
| | (1) OLS | (2) OLS | (3) OLS | (4) Probit | (5) OLS | (6) Probit |
| Ad. | −0.200 | | 0.031 | 0.440 | | |
| | (0.812) | | (0.007)*** | (0.122)*** | | |
| Ad. + info. | | 0.488 | | | −0.009 | −0.114 |
| | | (0.524) | | | (0.008) | (0.085) |
| Controls | Yes | No | Yes | Yes | No | No |
| Mean of control | 0.93 | 0.55 | 0.02 | 0.04 | 0.02 | 0.04 |
| $R^2$ | 0.02 | 0.02 | 0.07 | | 0.07 | |
| Number of obs. | 3403 | 2704 | 3403 | 3403 | 2704 | 2704 |

*Note*. Robust standard errors are in parentheses. The dependent variables for Columns (1) and (2) are the viewing time of Public 1 (in minutes) and for Columns (3)–(6) are the dummy, which takes the value 1 if an individual watched at least a minute of Public 1 during the experiment. "Ad." and "Ad. + info." are the treatment dummies for the first and second sub-experiments, respectively. The control variables for Columns (1), (3), and (4) are a dummy for supporting the LDP and for reading the Sankei newspaper. The control variables for Columns (2), (5), and (6) are the frequency of watching Channel 10 and a dummy for reading sports newspapers. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.12: Closeness and frequency of the 10 closest words to the Japanese and US governments' official statements.

| Japanese government | | | US government | | |
|---|---|---|---|---|---|
| Word | Count | Closeness | Word | Count | Closeness |
| Public Channel 1 | | | | | |
| 戦没者 (war dead) | 12 | 0.5712 | 旧日本軍 (Imperial Japanese Army) | 42 | 0.5804 |
| 真珠湾 (Pearl Harbor) | 98 | 0.5664 | 真珠湾攻撃 (Attack on Pearl Harbor) | 72 | 0.5739 |
| 真珠湾攻撃 (Attack on Pearl Harbor) | 72 | 0.5630 | 最高司令官 (HQ Commander) | 11 | 0.5587 |
| サンプソン (Sampson) | 39 | 0.5475 | 戦没者 (war dead) | 12 | 0.5429 |
| 旧日本軍 (Imperial Japanese Army) | 42 | 0.5470 | 真珠湾 (Pearl Harbor) | 98 | 0.5287 |
| 最高司令官 (HQ Commander) | 11 | 0.5369 | 出撃 (sally) | 20 | 0.5239 |
| 哀悼 (condolence) | 13 | 0.5313 | 戦艦 (warship) | 37 | 0.5139 |
| はなめがね (pince-nez) | 15 | 0.5298 | 侵攻 (invasion) | 13 | 0.5101 |
| 国家評議会議長 (Chairman of State Council) | 27 | 0.5273 | 日本軍 (Japanese Army) | 14 | 0.5098 |
| 佐世保高専 (Sasebo Kōsen) | 32 | 0.5267 | 軍人 (soldier) | 21 | 0.5076 |
| Private channels | | | | | |
| パールハーバー (Pearl Harbor) | 20 | 0.5916 | 旧日本軍 (Imperial Japanese Army) | 34 | 0.5804 |
| アリゾナ記念館 (Arizona Memorial Hall) | 16 | 0.5904 | 真珠湾攻撃 (Attack on Pearl Harbor) | 82 | 0.5739 |
| 惨禍 (calamity) | 13 | 0.5663 | パールハーバー (Pearl Harbor) | 20 | 0.5469 |
| ゴルフ日本シリーズ (Golf Nippon Series) | 18 | 0.5630 | アリゾナ記念館 (Arizona Memorial Hall) | 16 | 0.5429 |
| 戦没者 (war dead) | 13 | 0.5517 | 惨禍 (calamity) | 13 | 0.5372 |
| 真珠湾 (Pearl Harbor) | 246 | 0.5476 | 沿岸警備隊 (Coast Guard) | 11 | 0.5287 |
| 真珠湾攻撃 (Attack on Pearl Harbor) | 82 | 0.5475 | 艦船 (warship) | 17 | 0.5164 |
| ゲレロ (Guerrero) | 11 | 0.5472 | 戦没者 (war dead) | 13 | 0.5139 |
| ハバロフスク (Khabarovsk) | 16 | 0.5463 | 海兵隊 (Marines) | 59 | 0.5101 |
| マオリ (Maori) | 35 | 0.5451 | 真珠湾 (Pearl Harbor) | 246 | 0.5098 |

Table A.13: Closeness and frequency of the 10 closest words to the Japanese and Russian governments' official statements.

| Japanese government | | | Russian government | | |
|---|---|---|---|---|---|
| Word | Count | Closeness | Word | Count | Closeness |
| Public Channel 1 | | | | | |
| 日ロ (Japan-Russia) | 232 | 0.6430 | 日ロ (Japan-Russia) | 232 | 0.5733 |
| 北方領土問題 (Northern Territories dispute) | 119 | 0.6130 | 四島 (four islands) | 21 | 0.5610 |
| 北方四島 (Northern four islands) | 132 | 0.6070 | 北方四島 (Northern four islands) | 132 | 0.5469 |
| 平和条約 (Peace Treaty) | 272 | 0.5996 | 締結 (conclusion (of agreements)) | 156 | 0.5459 |
| 経済連携協定 (Economic Partnership Agreement) | 18 | 0.5958 | 北方領土問題 (Northern Territories dispute) | 119 | 0.5430 |
| 領土問題 (territorial dispute) | 100 | 0.5869 | 経済連携協定 (Economic Partnership Agreement) | 18 | 0.5386 |
| 締結 (conclusion (of agreements)) | 156 | 0.5722 | 加盟国 (member states) | 33 | 0.5370 |
| 日米同盟 (Japan-US alliance) | 68 | 0.5694 | 北方領土 (Northern Territories) | 339 | 0.5329 |
| 四島 (four islands) | 21 | 0.5694 | 同盟国 (allies) | 28 | 0.5309 |
| 北方領土 (Northern Territories) | 339 | 0.5641 | 国際機関 (international organizations) | 12 | 0.5301 |
| Private channels | | | | | |
| 二国間 (between two countries) | 11 | 0.6439 | 二国間 (between two countries) | 11 | 0.5905 |
| 日ロ (Japan-Russia) | 198 | 0.6430 | 両国間 (between both countries) | 14 | 0.5828 |
| 北方領土問題 (Northern Territories dispute) | 368 | 0.6130 | 日ロ (Japan-Russia) | 198 | 0.5733 |
| 北方四島 (Northern four islands) | 187 | 0.6070 | 四島 (four islands) | 100 | 0.5610 |
| 安保条約 (Security Treaty) | 12 | 0.5996 | 北方四島 (Northern four islands) | 187 | 0.5469 |
| 平和条約 (Peace Treaty) | 560 | 0.5958 | 安保条約 (Security Treaty) | 12 | 0.5459 |
| 両国間 (between both countries) | 14 | 0.5869 | クリミア半島 (Crimean Peninsula) | 14 | 0.5430 |
| 領土問題 (territorial dispute) | 468 | 0.5739 | 締結 (conclusion (of agreements)) | 336 | 0.5386 |
| 締結 (conclusion (of agreements)) | 336 | 0.5722 | 北方領土問題 (Northern Territories dispute) | 368 | 0.5370 |
| 日露 (Japan-Russia) | 192 | 0.5694 | 日露 (Japan-Russia) | 192 | 0.5329 |

Table A.14: Difference in closeness (100 vectors).

| | Public_1–Private TVs | p-value |
|---|---|---|
| Interacted with duration | | |
| Japan–USA | 0.812 | 0.000 |
| Japan–Russia | 2.151 | 0.000 |
| Without interaction | | |
| Japan–USA | 0.033 | 0.000 |
| Japan–Russia | 0.049 | 0.000 |

*Note.* For each program, the difference in the closeness to either government (domestic or foreign) is computed. Then, their averages are compared between the two types of broadcasters (Public 1 or (the average of) private channels). The difference and associated p-value are reported. The top panel takes into account the duration of the program, while the bottom panel does not. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 100.

Table A.15: Effect on political evaluations of the difference in the closeness to the official statements (100 vectors)

| | Dependent variable: | | | | | |
|---|---|---|---|---|---|---|
| | Δ Japan–Russia | | | Evaluation (North. Terr.) | | |
| | (1) All programs | (2) PM topic | (3) Russia topic | (4) All programs | (5) PM topic | (6) Russia topic |
| First-stage | | | | | | |
| Treatment | 0.054 | 0.041 | 0.025 | | | |
| | (0.021)** | (0.015)*** | (0.010)** | | | |
| Controls | Yes | Yes | Yes | | | |
| Mean of control | 0.45 | 0.28 | 0.19 | | | |
| $R^2$ | 0.69 | 0.65 | 0.62 | | | |
| Observations | 4156 | 4156 | 4156 | | | |
| OLS estimates | | | | | | |
| Δ Japan-Russia | | | | 0.046 | 0.124 | 0.274 |
| | | | | (0.072) | (0.099) | (0.142)* |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 4.41 | 4.41 | 4.41 |
| $R^2$ | | | | 0.12 | 0.12 | 0.12 |
| Observations | | | | 4156 | 4156 | 4156 |
| IV estimates | | | | | | |
| Δ Japan-Russia | | | | 4.943 | 6.636 | 10.973 |
| | | | | (2.541)* | (3.280)** | (5.890)* |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 4.41 | 4.41 | 4.41 |
| F-stat. | | | | 6.44 | 7.55 | 5.58 |
| Effect. F-stat. | | | | 6.44 | 7.55 | 5.58 |
| p-value (AR) | | | | 0.00 | 0.00 | 0.00 |
| CI (AR) | | | | [ 1.421, 14.906] | [ 2.091, 19.491] | [ 3.277, 34.060] |
| CI (Wald) | | | | [-.038, 9.924] | [ .208, 13.064] | [-.571, 22.517] |
| Observations | | | | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables for Columns (1)–(3) are the difference in the closeness to the official statements made by the domestic and foreign governments. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 100. The dependent variables for Columns (4)–(6) are the evaluation of the government's measures against the Northern Territories dispute. The main independent variables are the treatment variable (for Columns (1)–(3)) and the difference in the closeness to the official statements made by the domestic and foreign governments (for Columns (4)–(6)). "Δ Japan–Russia" is the difference in average closeness to the official statements made by the Japanese and Russian governments during President Putin's visit to Japan for the summit. Column (1) and (4) include all programs. Columns (2) and (5) restrict the sample to programs related to Prime Minister Abe, while Columns (3) and (6) restrict to programs related to Russia. The instrument is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. "Effective F-stat." is the effective F-statistic of Olea and Pflueger (2013). We use Stata's `weakivtest` to compute the test statistic. Weak instrument robust inference (AR test) is conducted and the corresponding p-values and confidence intervals are reported in rows labeled as "p-value (AR)" and "CI (AR)," respectively. We use Stata's command `rivtest` to compute the test statistic. *, **, and *** indicate $p<0.10$, $p<0.05$, and $p<0.01$, respectively.

Table A.16: Difference in closeness (drop low frequency words).

| | Public_1–Private TVs | p-value |
|---|---|---|
| Interacted with duration | | |
| Japan–USA | 0.339 | 0.001 |
| Japan–Russia | 1.431 | 0.000 |
| Without interaction | | |
| Japan–USA | 0.015 | 0.000 |
| Japan–Russia | 0.037 | 0.000 |

*Note.* For each program, the difference in the closeness to either government (domestic or foreign) is computed. Then, their averages are compared between the two types of broadcasters (Public 1 or (the average of) private channels). The difference and associated p-value are reported. The top panel takes into account the duration of the program, while the bottom panel does not. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 200. Only words with a minimum 50 counts are used in the data training process.

Table A.17: Effect on political evaluations of the difference in the closeness to the official statements (drop low frequency words)

| | Dependent variable: | | | | | |
|---|---|---|---|---|---|---|
| | Δ Japan–Russia | | | Evaluation (North. Terr.) | | |
| | (1) All programs | (2) PM topic | (3) Russia topic | (4) All programs | (5) PM topic | (6) Russia topic |
| First-stage | | | | | | |
| Treatment | 0.035 | 0.025 | 0.014 | | | |
| | (0.014)** | (0.010)** | (0.007)** | | | |
| Controls | Yes | Yes | Yes | | | |
| Mean of control | 0.36 | 0.18 | 0.12 | | | |
| $R^2$ | 0.75 | 0.64 | 0.63 | | | |
| Observations | 4156 | 4156 | 4156 | | | |
| OLS estimates | | | | | | |
| Δ Japan-Russia | | | | 0.191 | 0.225 | 0.390 |
| | | | | (0.101)* | (0.146) | (0.219)* |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 4.41 | 4.41 | 4.41 |
| $R^2$ | | | | 0.12 | 0.12 | 0.12 |
| Observations | | | | 4156 | 4156 | 4156 |
| IV estimates (Second-stage) | | | | | | |
| Δ Japan-Russia | | | | 7.598 | 10.930 | 19.275 |
| | | | | (3.944)* | (5.718)* | (11.248)* |
| Controls | | | | Yes | Yes | Yes |
| Mean of control | | | | 4.41 | 4.41 | 4.41 |
| F-stat. | | | | 6.01 | 6.13 | 4.33 |
| Effect. F-stat. | | | | 6.01 | 6.13 | 4.33 |
| p-value (AR) | | | | 0.00 | 0.00 | 0.00 |
| CI (AR) | | | | [ 2.444, 23.060] | [ 3.458, 33.345] | [ 5.469, 63.365] |
| CI (Wald) | | | | [ -.133, 15.329] | [-.277, 22.137] | [-2.770, 41.320] |
| Observations | | | | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables for Columns (1)–(3) are the difference in the closeness to the official statements made by the domestic and foreign governments. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 200. Only words with a minimum of 50 counts are used in the data training process. The dependent variables for Columns (4)–(6) are the evaluation of the government's measures against the Northern Territories dispute. The main independent variables are the treatment variable (for Columns (1)–(3)) and the difference in the closeness to the official statements made by the domestic and foreign governments (for Columns (4)–(6)). "Δ Japan–Russia" is the difference in average closeness to the official statements made by the Japanese and Russian governments during President Putin's visit to Japan for the summit. Column (1) and (4) include all programs. Columns (2) and (5) restrict the sample to programs related to Prime Minister Abe, while Columns (3) and (6) restrict to programs related to Russia. The instrument is the treatment dummy. The control variables include a dummy for supporting the Liberal Democratic Party, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. "Effective F-stat." is the effective F-statistic of Olea and Pflueger (2013). We use Stata's `weakivtest` to compute the test statistic. Weak instrument robust inference (AR test) is conducted and the corresponding p-values and confidence intervals are reported in rows labeled as "p-value (AR)" and "CI (AR)," respectively. We use Stata's command `rivtest` to compute the test statistic. *, **, and *** indicate $p<0.10$, $p<0.05$, and $p<0.01$, respectively.

Table A.18: Effect on the difference in the closeness to the official statements (Private 4).

| | Dependent variable: Average Exposure | | |
|---|---|---|---|
| | (1) All | (2) PM | (3) Russia |
| Treatment | 0.008 | −0.009 | −0.007 |
| | (0.016) | (0.009) | (0.006) |
| Controls | Yes | Yes | Yes |
| Mean of control | -0.10 | 0.14 | 0.10 |
| $R^2$ | 0.03 | 0.46 | 0.42 |
| Observations | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables for Columns (1)–(3) are the difference in the closeness to the official statements made by the domestic and foreign governments. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 200. Column (1) includes all programs. Column (2) restricts the programs to those related to Prime Minister Abe, while Column (3) restricts them to those related to Russia. "Treatment" is the treatment dummy. The control variables are a dummy for supporting the LDP, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Table A.19: Difference in closeness (party speeches).

| | Public_1–Private TVs | p-value |
|---|---|---|
| Interacted with duration | | |
| Ruling–Opposition | 0.932 | 0.000 |
| Ruling–Opposition (drop low freq.) | 1.179 | 0.000 |
| Ruling–Opposition (100 vectors) | 1.689 | 0.000 |
| Without interaction | | |
| Ruling–Opposition | 0.011 | 0.000 |
| Ruling–Opposition (drop low freq.) | 0.010 | 0.000 |
| Ruling–Opposition (100 vectors) | 0.029 | 0.000 |

*Note.* For each program, the difference in the closeness to either party (LDP (ruling party) or DP (opposition party)) is computed. Then, their averages are compared between the two types of broadcasters (Public 1 or (the average of) private channels). The difference and associated p-value are reported. The top panel takes into account the duration of the program, while the bottom panel does not. We use machine learning to compute the closeness measures, where the window size is set to 5. For each panel, the first row uses 200 vectors, the second row drops low frequency words, and the third row uses 100 vectors.

Table A.20: Effect on the difference in the closeness to the party speeches.

| | Dependent variable: Average Exposure | | |
|---|---|---|---|
| | (1) All | (2) PM | (3) Russia |
| Treatment | −0.006 | 0.000 | 0.005 |
| | (0.011) | (0.004) | (0.004) |
| Controls | Yes | Yes | Yes |
| Mean of control | -0.02 | 0.03 | 0.04 |
| $R^2$ | 0.05 | 0.18 | 0.40 |
| Observations | 4156 | 4156 | 4156 |

*Note.* Robust standard errors are in parentheses. The dependent variables are the difference in the closeness to the party speeches made by the ruling and opposition parties. We use machine learning to compute the closeness measures, where the window size is set to 5 and the vector size is set to 200. Column (1) includes all programs. Column (2) restricts the programs to those related to PM, while Column (3) restricts them to those related to Russia. "Treatment" is the treatment dummy. The control variables are a dummy for supporting the LDP, a minor party, and no party; a dummy for not reporting annual income and for reading the Sankei newspaper; trust and accuracy measures; and the viewing time of Public 1 before the experiment. *, **, and *** indicate $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively.

Figure A.1: Examples of program recommendations

## 今週末のおすすめの番組

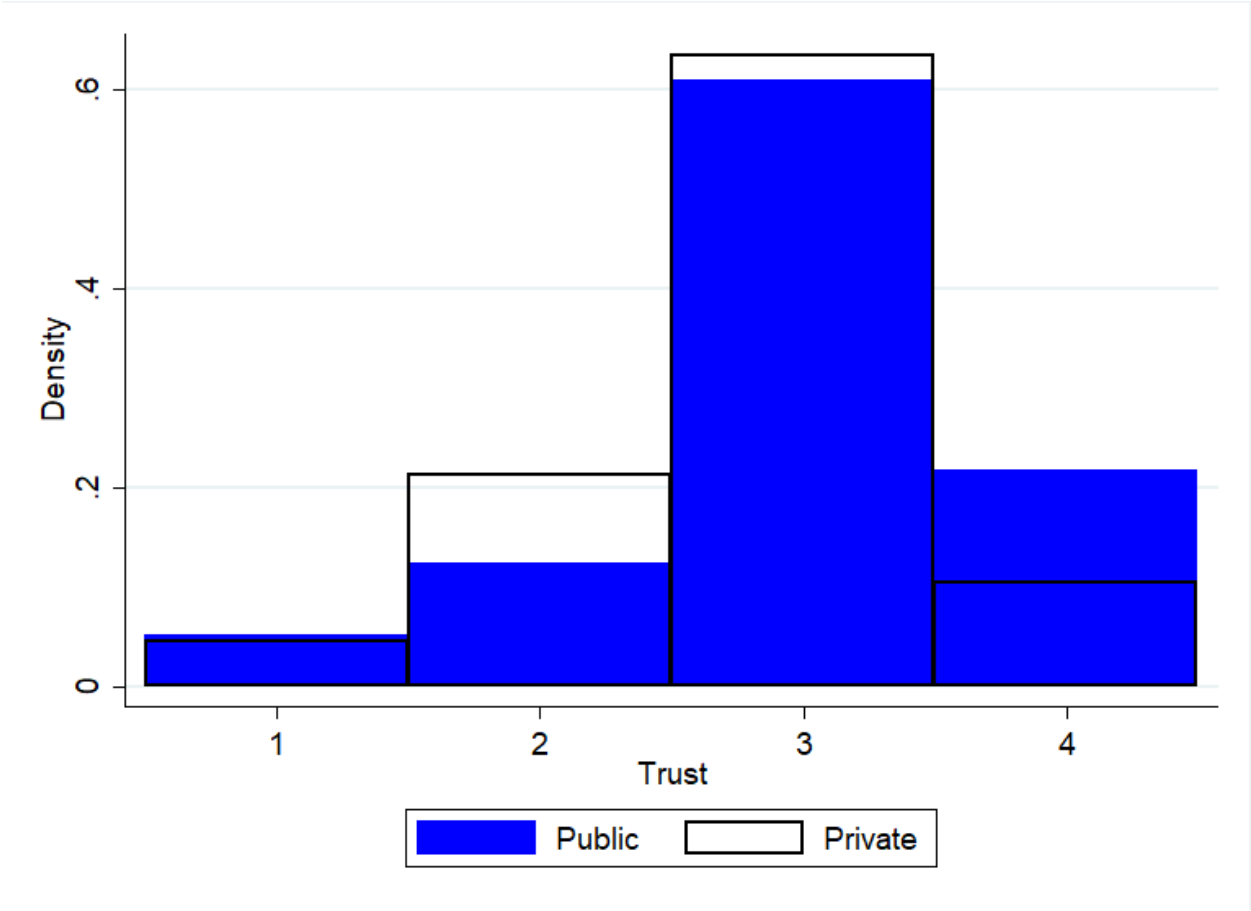
| 番組名 | ＮＨＫスペシャル<br>戦艦武蔵の最期<br>～映像解析　知られざる“真実”～ | ＴＶシンポジウム<br>複雑化する世界の中で<br>～今求められる人道支援路とは～ | ＮＨＫニュース７ |
|---|---|---|---|
| 放送日<br>時間 | 12月4日　日曜日<br>午後9時～9時50分<br>（総合） | 12月3日　土曜日<br>午後2時～3時<br>（Ｅテレ） | 12月3日(土)･4日(日)<br>午後7時～7時30分<br>（総合） |

## 今週末のおすすめの番組

| 番組名 | ＮＨＫスペシャル<br>戦艦武蔵の最期<br>～映像解析　知られざる“真実”～ | ＴＶシンポジウム<br>複雑化する世界の中で<br>～今求められる人道支援路とは～ | ＮＨＫニュース７ |
|---|---|---|---|
| 放送日<br>時間 | 12月4日　日曜日<br>午後9時～9時50分<br>（総合） | 12月3日　土曜日<br>午後2時～3時<br>（Ｅテレ） | 12月3日(土)･4日(日)<br>午後7時～7時30分<br>（総合） |
| 内容 | 日本の最高機密として極秘に建造された戦艦「武蔵」。太平洋戦争末期、壮絶な最期を遂げたとされるが、資料が少なく、真相は謎に包まれてきた。去年３月、フィリピン沖１２００ｍの深海で武蔵が発見され大ニュースとなった。ＮＨＫは膨大な未公開映像とデータを入手。最新の映像解析技術で知られざる武蔵の“真実”が浮かび上がった。驚くべき内部構造や凄まじい攻撃力。定説を覆す“意外な姿”とは。戦艦武蔵の謎に迫る。 | 世界各地で増加する武力紛争による難民、そして地震や洪水による被災者の増加など支援を必要な人は年々増えています。今、必要な人道支援について議論します。 | 夜７時、これさえ見れば１日が分かる。今日の日本・世界の今を、あなたのもとへ 【キャスター】高瀬耕造，【サブキャスター】橋本奈穂子，【気象キャスター】菊池真以 |

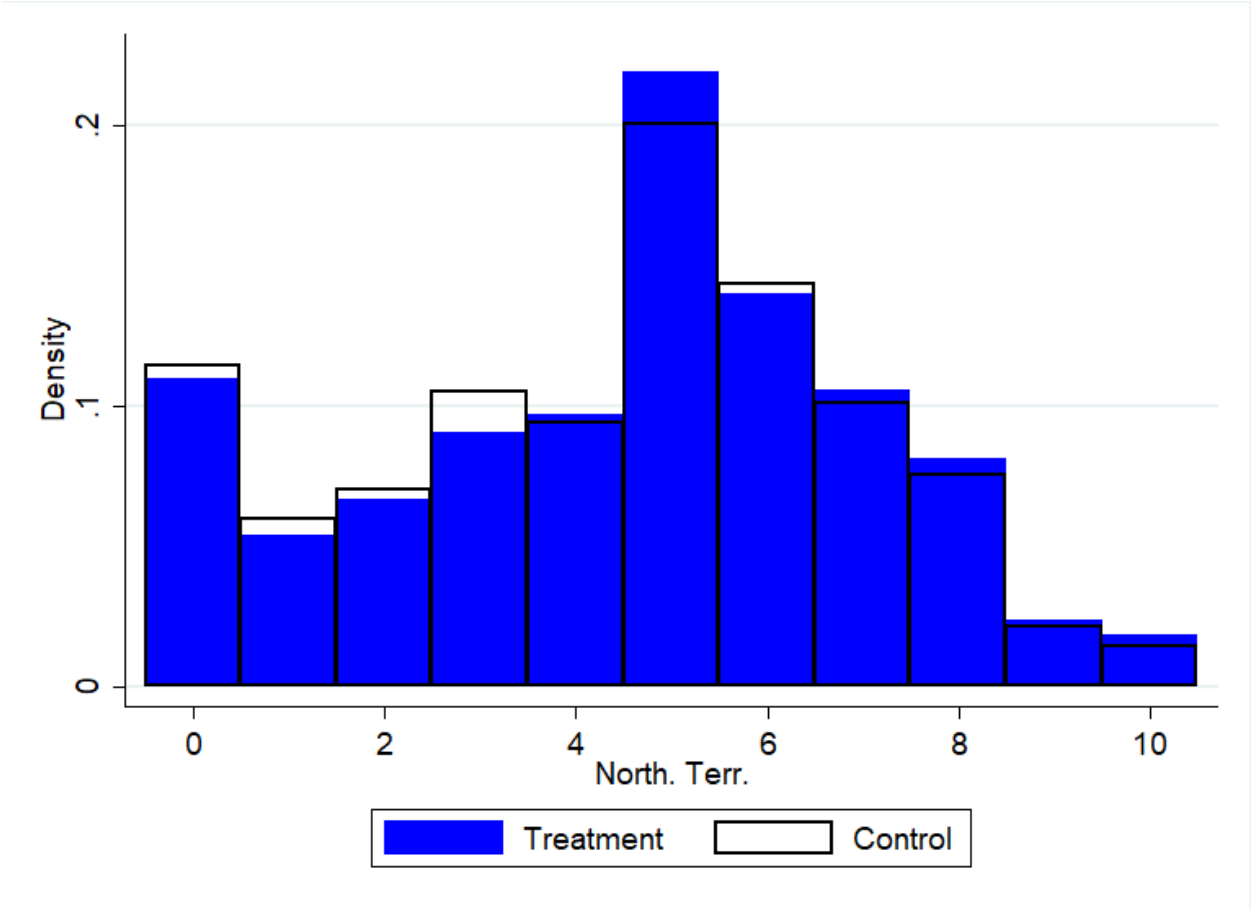
*Note.* The top panel does not include the description of the program (“control” in the second sub-experiment), while the bottom panel includes it (“treatment” in the second sub-experiment). See the main text for more details.

Figure A.2: Media trust in public and private broadcasting.



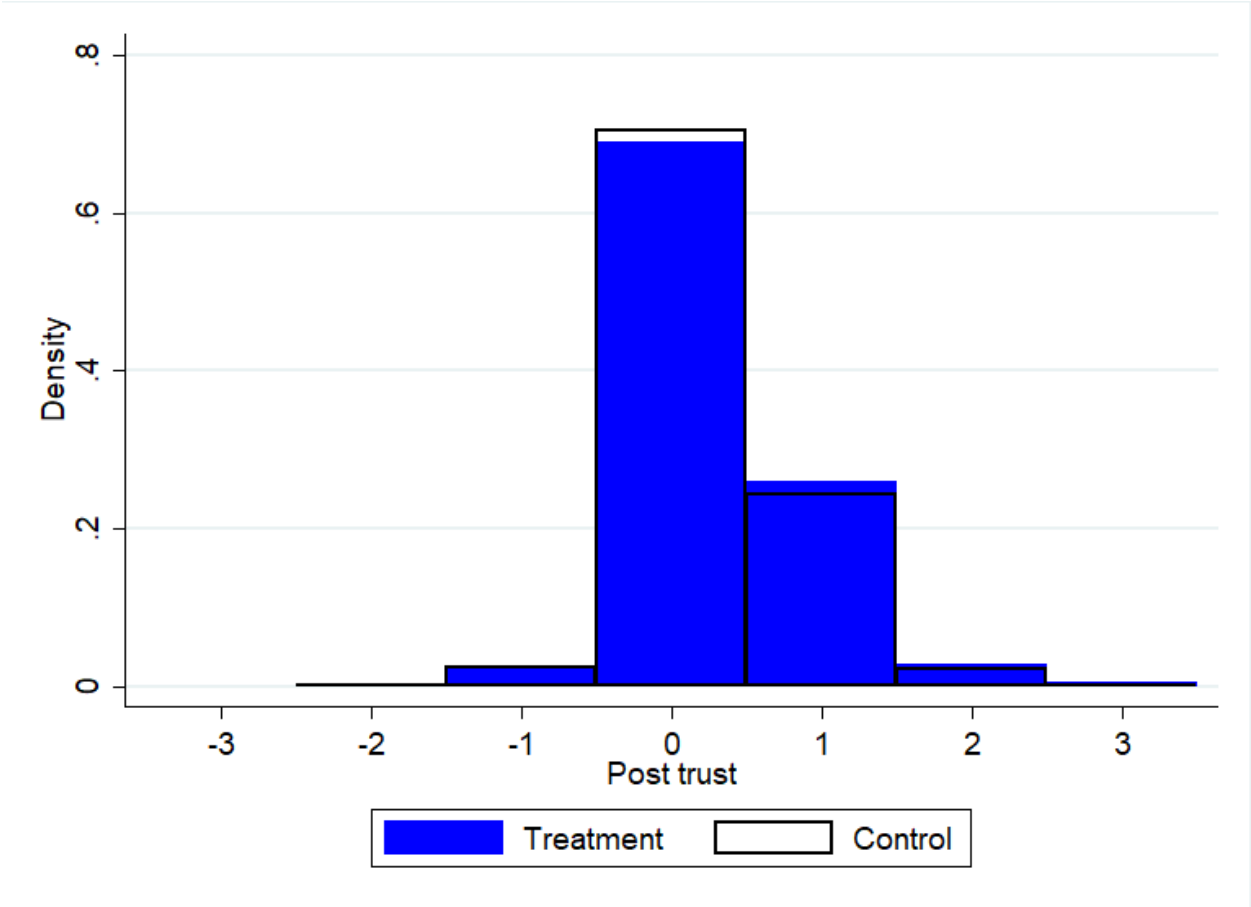

*Note.* The distribution of trust levels in public and private broadcasting. The mean values are 2.99 and 2.80, respectively.

Figure A.3: Change in the evaluation of the policy for the Northern Territories dispute: Treatment versus control (raw data)



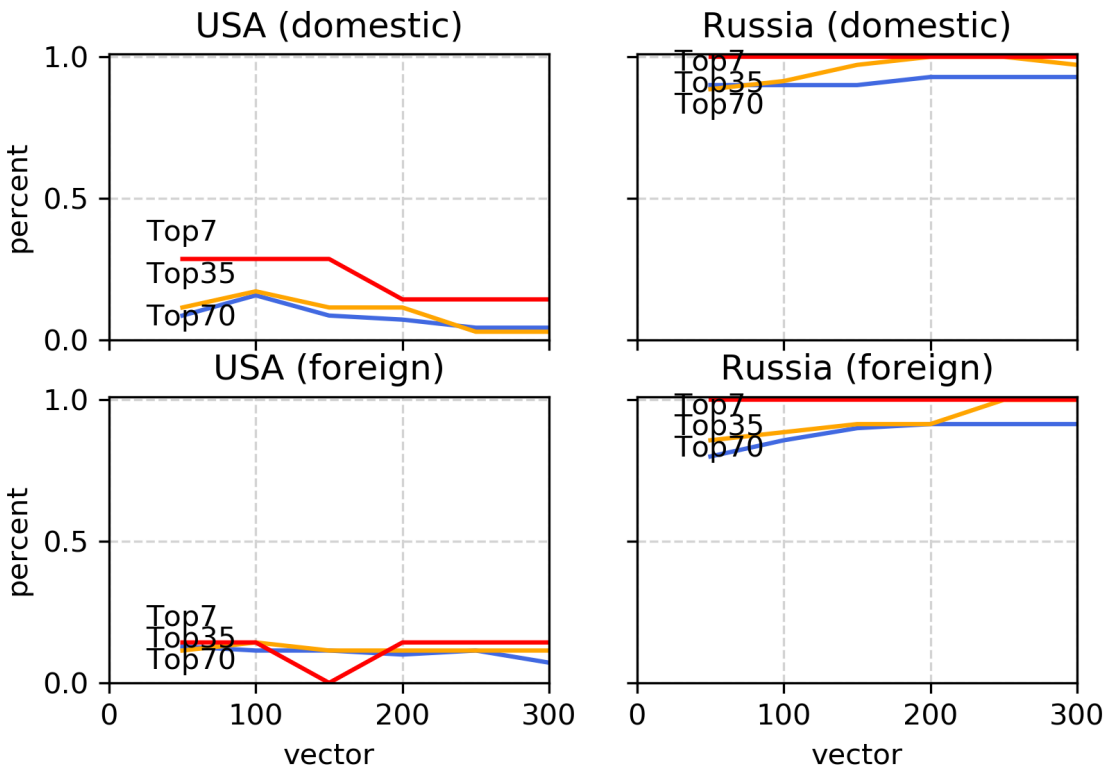

*Note.* The distribution of the evaluation of the government's measures against the Northern Territories dispute ("How do you evaluate the government's measures against the Northern Territories dispute?" (0 to 10 points)) for the treatment and control groups.

Figure A.4: Change in the post-experimental net trust levels for those who trust Public TV more: Treatment versus control (raw data)



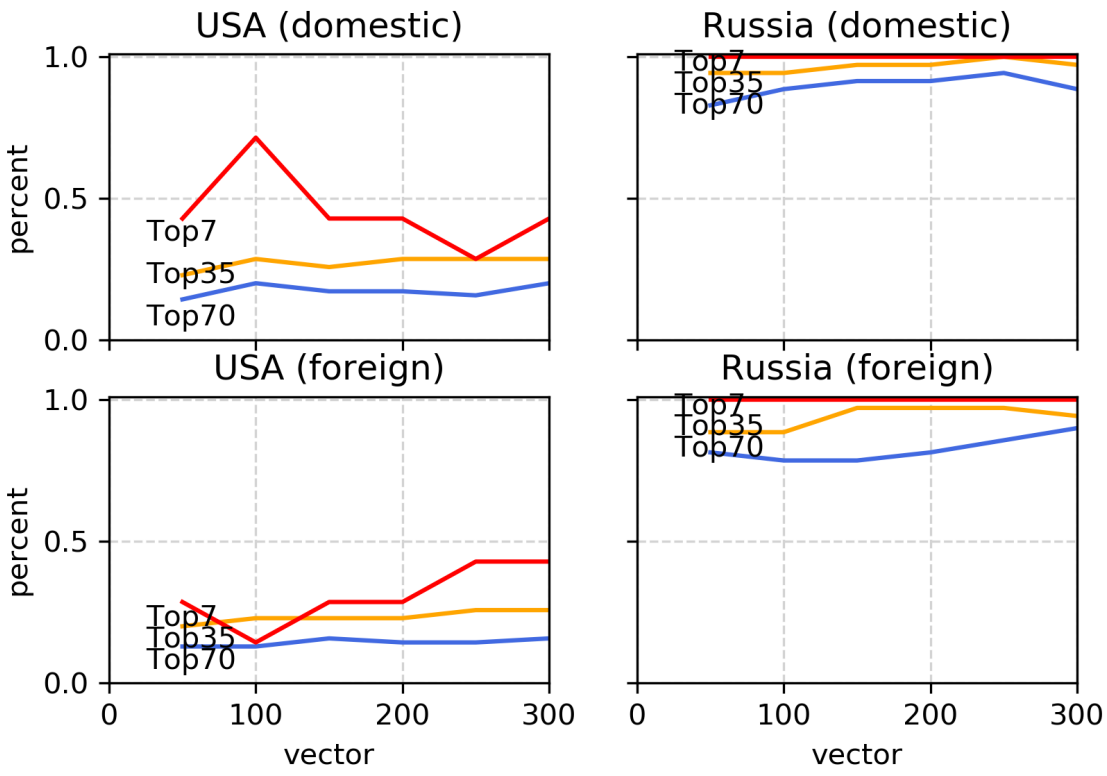

*Notes*: The distribution of the post-experimental net trust level in Public TV, which is the difference between the trust level in Public TV and in private broadcasters between the treatment and control groups. The sample includes only those who trusted Public TV more than or as much as private broadcasters according to the baseline survey.

Figure A.5: Predictability of our machine, USA and Russia topics (window=15)



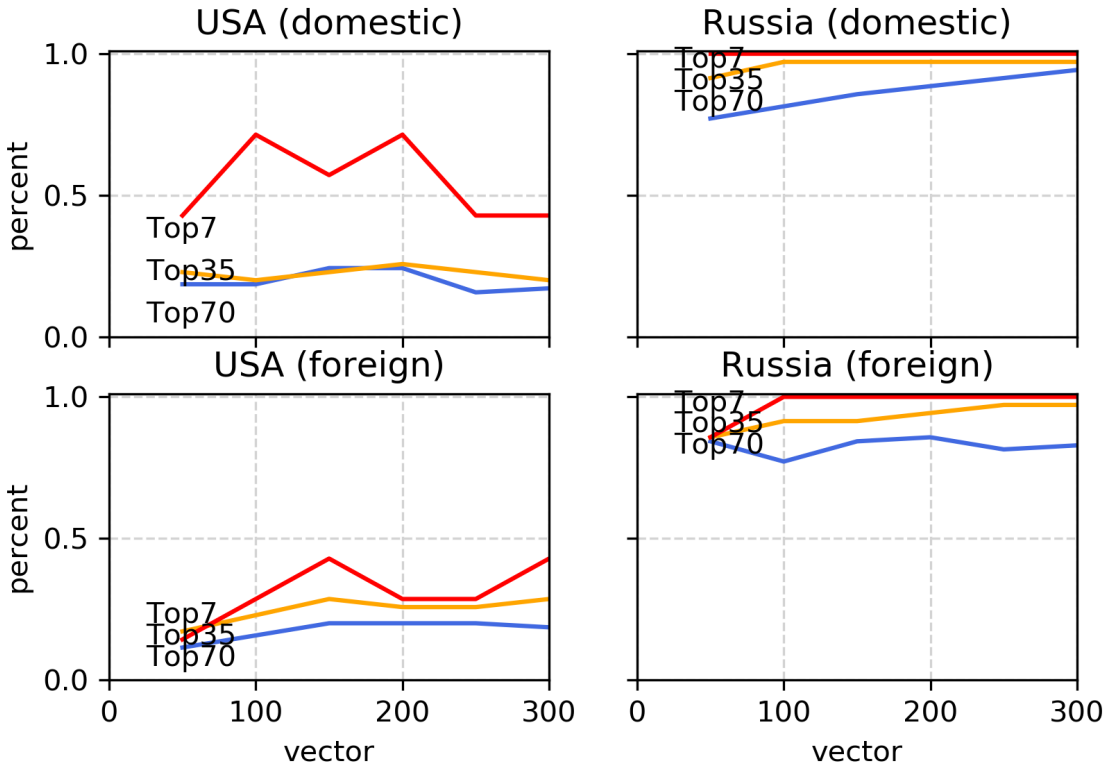

*Note.* The figures plot the percentage of TV programs categorized as either the USA topic or the Russia topic for those that are the closest to the official statements (top 7, top 35, and top 70 closest programs): the left figures use the closeness to the Japanese government's statement (top) and the US government's statement (bottom) during Prime Minister Abe's visit to Pearl Harbor with President Obama; the right figures use the Japanese government's statement (top) and the Russian government's statement (bottom) during President Putin's visit to Japan for the summit. We use machine learning to compute the closeness measures, where the window size is set to 15.

Figure A.6: Predictability of our machine, USA and Russia topics (window=5)



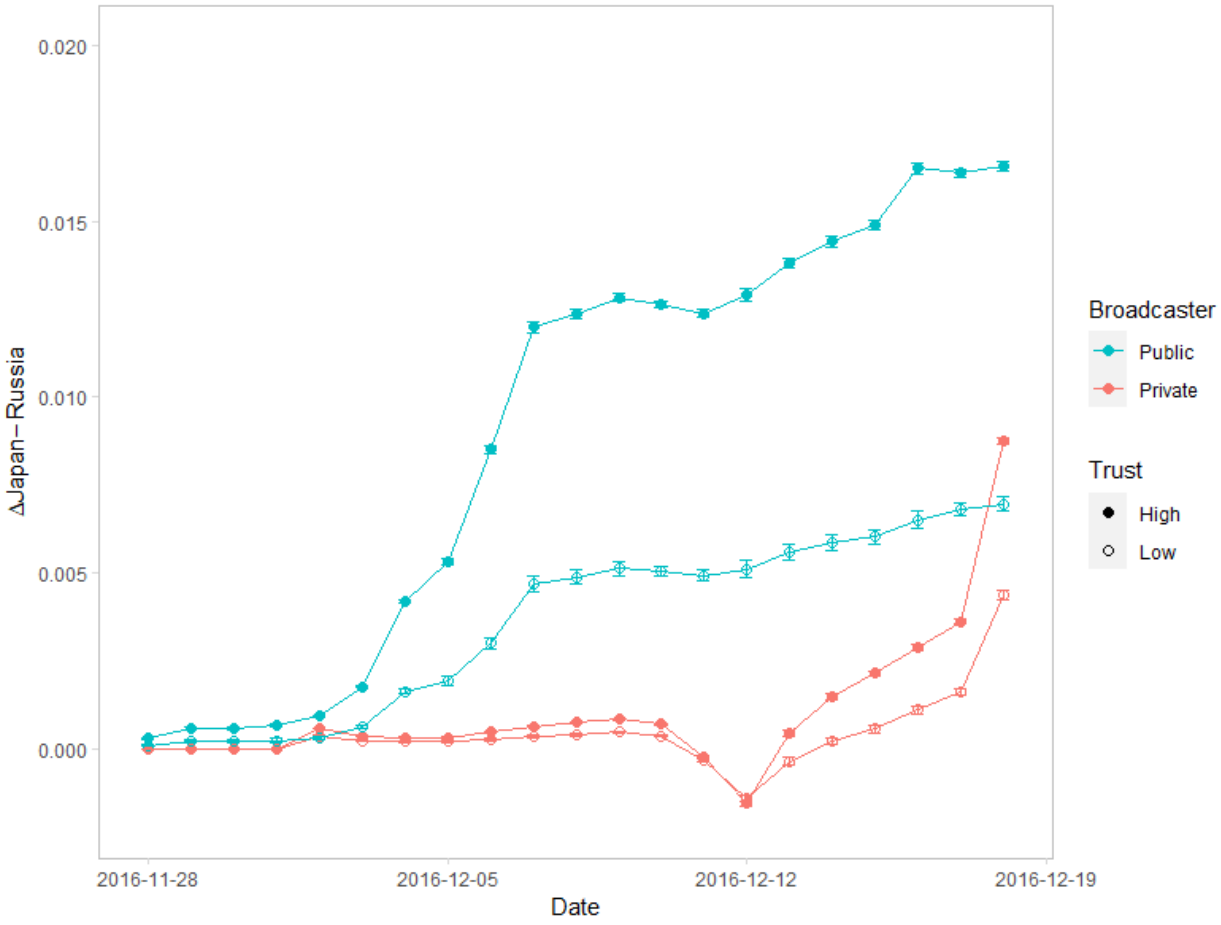

*Note.* The figures plot the percentage of TV programs categorized as either the USA topic or the Russia topic for those that are the closest to the official statements (top 7, top 35, and top 70 closest programs): the left figures use the closeness to the Japanese government's statement (top) and the US government's statement (bottom) during Prime Minister Abe's visit to Pearl Harbor with President Obama; the right figures use the Japanese government's statement (top) and the Russian government's statement (bottom) during President Putin's visit to Japan for the summit. We use machine learning to compute the closeness measures, where the window size is set to 5.

Figure A.7: Predictability of our machine, USA and Russia topics (drop low frequency words).




*Note.* The figures plot the percentage of TV programs categorized as either the USA topic or the Russia topic for those that are the closest to official statements (top 7, top 35, and top 70 closest programs): the left figures use closeness to the Japanese government's statement (top) and the US government's statement (bottom), respectively during Prime Minister Abe's visit to Pearl Harbor with former President Obama; the right figures use the Japanese government's statement (top) and the Russian government's statement (bottom), respectively during President Putin's visit to Japan for the summit. We use machine learning to compute the closeness measures, where the window size is set to 5. Only words with a minimum of 50 counts are used in the data training process.

Figure A.8: Transition of beliefs based on our model




*Notes*: Individuals' beliefs are computed using the model in Section A.5 and individuals' viewing records.

Figure A.9: Original instructions

**アンケートにご協力いただきありがとうございます。このアンケートでは、後日実施する【メディア利用に関する日記式調査】にご協力いただける方を募集しています。**

**【調査概要】**

本調査は、XX（以下、X）が、消費者のテレビの視聴動向や、メディア利用動向を把握するために実施します。
調査期間内に同じ方に複数の調査をさせていただき、日々のテレビの視聴動向を調査することで、視聴者のメディアの利用シーンやニーズを検討いたします。
調査期間は約1ヶ月（11月14日から12月19日まで）です。

本調査の構成は、以下の通りです。

○毎日のテレビ番組の視聴動向調査：
毎日のテレビ番組については、見た番組を番組表の中でチェックします。
毎日ですが、簡単なアンケートです。

○メディア利用に関する調査：
日々のメディア利用や、メディアに対する考え方、Xに対する考え方について伺います。
調査開始時と終了時の2回行います。

毎日アンケートすべてに回答するのは大変だと思いますので、毎日のテレビ番組の視聴動向調査とメディア利用に関する調査はアンケートの回答に3日間の余裕がございます。

**【データの取扱い】**

アンケートの回答内容は、個人情報（特定の個人を識別する情報）を排除した形で、Xに提供いたします。
本調査結果は個人を特定しない統計的な利用の範囲で活用し、Z等で公表します。
本調査でXが取得した情報を、本調査の目的以外に利用したり、第三者へ提供することは行いません。

**【ポイント】**

アンケートは毎日届きます。
ポイントは後日まとめて付与させていただきます。
また約1ヶ月間の回答した回数に応じて、後日ボーナスポイントを差し上げます。

**【備考】**

- 【メディア利用に関する日記式調査】への参加依頼のご連絡は、調査のオペレーションを担当するYからさせていただきます。
- 本調査に参加してくださる方は、本調査の条件について、同意をいただいたものとさせていただきます。
- 応募いただいた中から抽選で、11月13日（日）までに次のステップのご連絡をさせていただきます。
  ご連絡がなかった場合には、何卒ご了承下さい。

*Note.* XX and X are the name of Public_1 and its abbreviation, respectively. Y is the name of the survey company. Z is the name of Public_1's website.

Figure A.10: Instructions translated into English

**Thank you for participating in the survey.**
**In this survey, we recruit people who can participate in a Record-Based Survey on Media Usage, which will be implemented later.**

**[Survey outline]**

The surveys are implemented in order for XX (hereafter, X) to understand consumers' TV viewing and media usage habits.
During the survey period, we will conduct multiple surveys, and examine viewers' media usage and needs by investigating their daily TV viewing habits.
The survey period will last for approximately one month (from November 14 to December 19).

The composition of the surveys is as follows:

◯ Surveys of daily TV viewing habits:
Checkmark TV program(s) you saw in the TV guide every day.
Even though the survey is conducted daily, it is easy to answer.

◯ Media usage surveys:
Your daily media usage and your thoughts on media and X.
The survey will be conducted at the beginning and at the end of the survey period.

As it may be difficult to answer the questionnaire every day, you can take three days to answer either type of survey.

**[Data handling]**

Your answers will be given to X after removing personal information from the questionnaires (i.e., information that identifies a particular individual).
The results of the surveys will only be used for statistical purposes without identifying any individual, and will be published in, e.g., Z.
The information obtained by X will not be used for any purpose other than that for which the survey was intended. No information contained in the survey will be given to third parties.

**[Reward points]**

You will receive a questionnaire every day.
Reward points will be given later.
In addition, bonus points will be given according to the number of answers you give.

**[Remarks]**

・A participation request for a Record-Based Survey on Media Usage will be sent by Y, which is responsible for survey operations.
・By participating in this survey, we assume that you have agreed to the terms and conditions of the survey.
・Some of the applicants will be chosen at random and informed about the next step of the survey. We kindly ask for your understanding if you are not chosen as a candidate.

*Note.* XX and X are the name of Public_1 and its abbreviation, respectively. Y is the name of the survey company. Z is the name of Public_1's website.