CAN PARTISAN NEWS SHIFT POLITICAL PREFERENCE AND VOTING BEHAVIOR? EXPERIMENTAL EVIDENCE FROM TAIWAN'S GENERAL ELECTIONS 2016[*]

Chun-Fang Chiang[†]   Semin Kim[‡]   SunTak Kim[§]

Chien-Hsun Lin[¶]   Ming-Jen Lin[‖]

October 21, 2020

Abstract

We conduct an experiment to investigate the effects of partisan news on the 2016 Taiwan presidential and legislative elections. Subjects are randomly divided into four groups: KMT (the ruling party), DPP (the opposition party), Third-Party and Control, and provided with distinct partisan news articles. We incentivize subjects' readings of the assigned articles by payments according to quiz scores. We find that reading partisan news articles have increased support for intended target presidential candidates and decreased support for competing candidates. Our treatments have reinforced subjects' existing preferences in presidential voting while the treatments have changed their voting intentions in party voting. (*JEL* D72, C91, L82)

[†]Department of Economics, National Taiwan University, Associate Professor, No.1, Sec.4, Roosevelt Rd., Da'an Dist., Taipei 10617, Taiwan. Email: chunfang@ntu.edu.tw https://orcid.org/0000-0002-7034-2001

[‡]Department of Economics, Yonsei University, Associate Professor, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Korea. Email: seminkim@yonsei.ac.kr https://orcid.org/0000-0003-4478-7493

[§]Corresponding Author; Department of Economics, National Taiwan University, Assistant Professor, No.1, Sec.4, Roosevelt Rd., Da'an Dist., Taipei 10617, Taiwan. Email: sunkim@ntu.edu.tw https://orcid.org/0000-0002-6481-720X

[¶]Department of Economics, University of California, PhD Student, 2127 North Hall, Santa Barbara, CA 93106, United States. Email: chienhsunlin@ucsb.edu https://orcid.org/0000-0003-3454-0032

[‖]Department of Economics, National Taiwan University, Distinguished Professor, No.1, Sec.4, Roosevelt Rd., Da'an Dist., Taipei 10617, Taiwan. Email: mjlin@ntu.edu.tw https://orcid.org/0000-0002-7174-2226

I.   INTRODUCTION

There exist continued scholarly interests in the effects of media on important electoral and voting decisions.[1] Early studies of media found relatively minor effects on people's voting intentions (Lazarsfeld, Berelson, and Gaudet 1944; Berelson, Lazarsfeld, and McPhee 1954). One main finding was that media was more likely to reinforce the existing opinions of its audience than it was to change such opinions (Klapper 1960). Recent economic studies, with improved research designs and empirical strategies, have been able to better identify the effects of media on vote choices/voting intentions (DellaVigna and Kaplan 2007; Gerber, Karlan, and Bergan 2009; Chiang and Knight 2011; Enikolopov, Petrova, and Zhuravskaya 2011; Martin and Yurukoglu 2017), on voter turnout (Gentzkow 2006; George and Waldfogel 2006; Gentzkow, Shapiro, and Sinkinson 2011), or on voter responsiveness (Ferraz and Finan 2008).

Among other things, Gerber et al. (2009) conducted a field experiment treating free subscriptions to either the conservative *Washington Times* or the liberal *Washington Post* to investigate the effects of two newspapers with opposite ideologies in the 2005 Virginia gubernatorial election. In a similar vein, we treated our subjects with news articles from right-leaning newspapers, supporting *Kuo-Ming Tang* (KMT) and its presidential candidate *Chu*, or articles from left-leaning newspapers, supporting *Democratic Progressive Party* (DPP) and its candidate *Tsai*; we also had a third treatment group, treated with articles from various sources including internet media, supporting new minor parties (positioned to the left of DPP).[2] The main purpose of our experiment is to measure the effects of slanted news articles on presidential and party voting in the 2016 presidential and general elections of Taiwan. In addition, our study makes a distinction between the treatments promoting well-known traditional parties and that promoting new minor parties since the latter treatment was expected to provide relatively novel and unexpected information.

While Gerber et al. (2009) offered the free subscriptions treatments for one month before the Virginia election, they couldn't be sure whether the treated newspapers were actually read by the intended subject groups.[3] Our experimental design aimed

---

[1]Economists usually adopt the rational learning model of media effects and regard voters as rational, Bayesian updaters while communications researchers focus more on manipulative effects of media through agenda setting, priming, and framing. Stromberg (2015) provides a rather complete survey about economic studies of media, and Scheufele and Tewksbury (2007) is a survey about communications studies of the same topic.

[2]Hence, we named our treatment groups KMT, DPP, and Third-Party treatment according to the partisan ideologies of the assigned new articles. Refer to the following subsection for background information about Taiwanese politics.

[3]Although they gave 10-week free subscriptions to the *Times* or the *Post*, they started these

at providing stronger incentives to read the assigned news articles. During the period of one and a half months before the 2016 elections, subjects received articles every week (40 articles in total for each individual) and were invited to join quiz sessions at the National Taiwan University three times, as well as two online quiz sessions between the on-site sessions (with participation rates 95-100%).[4] The subjects could answer the questions (140 questions in total) correctly only if they read the assigned articles carefully (subjects' payments were mainly for their correct answers). The subjects were also invited to join the Initial and Final Survey sessions to report their political preferences at the outset and voting decisions after the elections.[5] Our design of payment scheme was intended to give further incentives for subjects to read news information that might be inconsistent with their prior beliefs, and thus facilitate the persuasive effects of partisan news.[6]

Our results on presidential voting show that the KMT treatment has increased support for the rightist candidate *Chu* by 7.9%, while the DPP treatment has decreased it by 3.1%, and the difference between these two effects (working in opposite directions to each other) turned out to be significant. Similarly, the KMT and Third-Party treatments has decreased support for the leftist candidate *Tsai* by 7.2% and 7.1% respectively, while the DPP treatment has increased it by 7.5%, and the differences between KMT and DPP treatment effects, and between DPP and Third-Party effects were again significant. Beyond these baseline treatment effects, we also examined the effects of being treated with the articles whose ideology was consistent with one's initial political preferences and found that our treatments had strong effects of reinforcing the existing preferences for presidential candidates. In fact, subjects

---

treatments only one month before the election. Also, their analysis about survey data (Table 2, p.44) suggests less than full readership of those in the treatment groups, and some of their subjects were even confused with whether they indeed received the assigned newspaper or not.

[4]We selected important issues first and found related articles for the different treatment groups. However, the numbers of the selected articles for an issue were usually different across the treatment groups, which could reflect the real-world coverage choices of the newspapers considered (see Table 4).

[5]A potential problem is whether subjects reported their voting decisions truthfully in the Final Survey. The questions about political preferences or voting decisions are asked frequently in pre-election polls and other survey in many democratic societies. It is also a widely used method to elicit political decisions in many studies including Gerber et al. (2009).

[6]Subjects may have tried to find more news information from sources other than the treated articles, and this could lead to over- or under-estimation of treatment effects. In order to understand how our treatments have affected the subjects' daily media consumption, we conducted a mediation analysis to distinguish between direct and indirect effects of the treatment articles. We found that the observed treatment effects were mostly attributable to the direct effects of our treatments while the indirect effects through additional media consumption were negligible (see the final section as well as the appendix).

3

were about 19% more likely to vote for the candidate whom they originally preferred when they read the articles that were supportive of the same candidate.[7]

Furthermore, when we conducted the same analyses with a subsample of the subjects who had not yet decided for which candidate to vote (even if they revealed their preferred candidate), as reported in the Initial Survey, the results show that all major findings about the baseline and reinforcement effects were driven by these *undecided* subjects or *swing* voters. This finding can be understood as evidence that our treatments have indeed reinforced the weak voting intentions of these undecided subjects in the presidential election. However, we failed to find any evidence that our treatments have changed the existing voting intentions for the presidential candidates (persuasion effect), and this could be because these candidates (*Tsai* and *Chu*) were from the two major parties in Taiwan whose ideological positions were well known (and our treatments didn't provide completely new information about them).

On the other hand, our analysis of party voting shows that the Third-Party treatment had strong persuasive effects for the new third parties, especially increasing support for GSD (*Green Party & Social Democratic Party*) by a fairly large margin of about 30%. Further analysis excluding those who originally preferred the new parties revealed that the observed treatment effects acted to change initial voting intentions for parties (for example, the Third-Party treatment was shown to increase support for GSD by about 35% among those who initially didn't support the party). An explanation for this result is that our treated articles provided an opportunity for the subjects to learn the propaganda of the minor parties that were new in the Taiwanese political scene. Overall, our subjects can be viewed as rational, sophisticated voters who may be affected only moderately by well-known information but can also be affected to the point of changing their voting intentions when faced with novel information, which is reminiscent of the findings of Chiang and Knight (2011) about unexpected endorsements.[8]

Gerber et al. (2009) found that both newspapers have increased support (self-reported votes) for the Democratic candidate, but only the effect of the *Washington Post* was significant and much greater in magnitude. In our study, the treatments

---

[7]We have a reason to believe that experimenter demand effect, if any, is weak in our study. First, the reinforcement effect was highly selective and observed mainly among those who preferred *Tsai* and were treated with pro-DPP articles. Second, the support for *Tsai* tended to decrease and the support for GSD (*Green Party & Social Democratic Party*) tended to increase in *all* treatment groups, which is inconsistent with the hypothesis of the demand effect. For more details, see the section about reinforcement and persuasion effects.

[8]Chiang and Knight (2011) found that stated voting intentions shifted toward Gore by a much greater margin when he was surprisingly endorsed by the *Denver Post* than by the *New York Times* as expected.

have not only increased support for their intended target candidate but also decreased support for the competing candidates in presidential voting, thus the treated media slants working in correct directions as expected. The main channel for the media slant effects was by reinforcing (mainly undecided) subjects' initial voting intentions for presidential candidates. Peisakhin and Rozenas (2018) obtained a similar reinforcement or confirmation effect of media with a finding that the effect of Russian TV was largest among voters with strong pro-Russian priors in the 2014 presidential and parliamentary elections in Ukraine. Sunstein et al. (2017) and Fryer et al. (2019) considered belief updating in the presence of confirmation bias while Thaler (2020) studied interaction between a similar bias and fake news; these latter studies have been conduced in a more abstract setting with a limited number of issues, resulting in effects that reinforced the existing beliefs or preferences.

DellaVigna and Kaplan (2007), Chiang and Knight (2011), Enikolopov et al. (2011), and more recently, Martin and Yurukoglu (2017) have succeeded in identifying persuasive effects of media in the context of presidential or general elections. De Benedictis-Kessner et al. (2019) also tried to estimate a persuasion effect of news articles, while focusing on a single issue of marijuana. However, we should say that finding out a persuasive effect of media (changes in original political preferences or voting intentions) is an exception rather than a rule in the literature, especially when the observation period of media exposure is relatively short. In view of the previous research about media effects, the contribution of our study is clear; first, we employed a straightforward experimental design, hence relatively free of problems with identifying causality; second, we demonstrated both reinforcement and persuasive effects of media in a single framework that varied the nature of provided news information; and finally, we covered a fairly comprehensive range of news issues prior to important real elections, with the aim of affecting real voting decisions.

A drawback of out study is its small sample size. While we maintained the intensity of treatments through repeated interactions with subjects, we had to sacrifice sample size. Fortunately, tighter control over subjects led to a low attrition rate - 190 out of 212 subjects remained in our Final Survey (vs. 1,081 out of 3,347 in Gerber et al. 2009). In addition to our findings about the media effects that have shown to work through various channels, the persuasive effects of our media treatments, measured as persuasion rates (DellaVigna and Kaplan 2007; DellaVigna and Gentzkow 2010), were comparable to (and sometimes surprisingly higher than) those of previous research.[9] We thus contribute to the literature of partisan media effects by

_____

[9]For example, the persuasion rate among those exposed to the DPP treatment was 43 percent of the subjects not already supporting *Tsai*, and similarly, the persuasion rate of the Third-Party treatment was 41 percent of the subjects not initially supporting the GSD. These results make a

studying the case of the 2016 Taiwan Elections and complement the existing media research focused mainly on U.S. politics.

After a short survey section about Taiwanese politics, the paper proceeds as follows. Section II. describes the experiments in more detail. Section III. presents the experimental results, including the *reinforcement* and *persuasion* effects of our treatments. Finally, Section IV. discusses and concludes the paper.

A. Backgrounds of Taiwanese Political Parties and the 2016 Elections

After being defeated in the 1949 Chinese Civil war, *Chiang Kai-Shek* and *Kuo-Ming Tang* (KMT) fled to Taiwan and relocated the Republic of China there. The KMT was the only ruling party on the island until 1986, when the *Democratic Progressive Party* (DPP) was founded. In the past 25 years, the DPP and the KMT have been the two major parties in Taiwan's political arena and have won the presidential elections twice each since 1996. The situation is similar in the Legislative Yuan after 1991, where the national legislators are elected using a mixed electoral (single-district two-votes) system. In addition to KMT and DPP, there are several small parties who may also put forward their own candidates, but these candidates usually occupy, at most, 10% of the seats in every election.

The 2016 presidential election had three contestants: *Ing-Wen Tsai* from the DPP, *Eric (Li-Lun) Chu* from the KMT, and *James (Chu-Yu) Soong* from the (center-right) *People First Party* (PFP). The general public opinion and the polls before the Election showed that *Tsai* and DPP would win by a wide margin, and the outcome was consistent with the prediction.[10] In addition, two news parties founded in 2015, the *New Power Party* (NPP) and the *Green Party & Social-Democratic Party* (GSD), entered the legislative election.[11] The NPP and GSD were nicknamed "The Third Way", and the NPP has won enough party and candidate votes to have their own party legislators.[12]
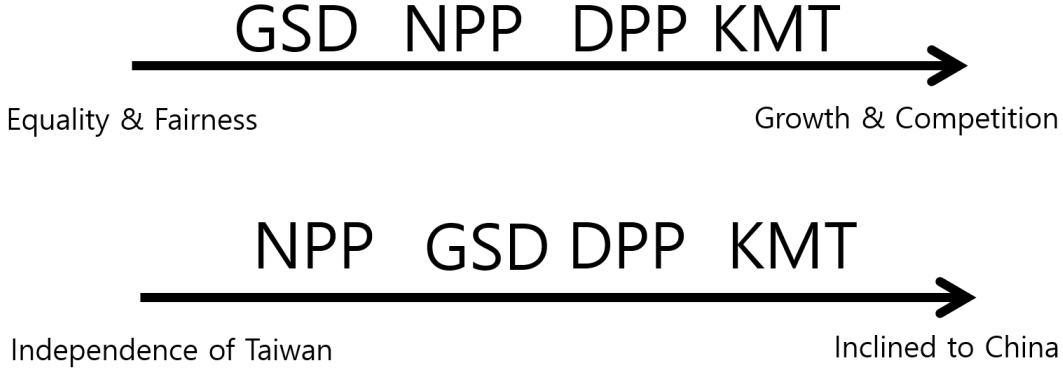
---

good contrast with the persuasion rates of the previous studies; e.g. the persuasion rate of the *Washington Post* was 19.5% which exemplified a large persuasion effect in the literature (see Table 13 and also DellaVigna and Gentzkow 2010).

[10] *Tsai* defeated *Chu* by a landslide (56 vs. 31%) with *Soong* having won a small share (13%). The vote shares for KMT and DPP were 44% and 27%, respectively. https://en.wikipedia.org/wiki/2016_Taiwan_presidential_election

[11] The new (leftist) third parties such as GSD and NPP became popular after the Sun Flower Movement in 2014 which was a protest movement driven by a coalition of students and civic groups against a trade agreement with China that was pursued by KMT, the ruling party at that time.

[12] 34 out of 113 seats in the Legislative Yuan were filled from closed-list proportional representation (PR) via national party votes in the 2016 Elections. A mixed electoral system for the legislative

FIGURE 1

Ideological Positions of Taiwanese Parties

GSD NPP DPP KMT

Equality & Fairness   Growth & Competition

NPP GSD DPP KMT

Independence of Taiwan   Inclined to China

On the policy spectrum, the KMT has been seen as pro-China in political standing, and center-right in economic policy, while the DPP emphasizes Taiwan's relative independence and holds a center-left position. The two third parties, GSD and NPP, emerging from the 2014 Sunflower Movement, are inclined to support an independent Taiwan in national identity and are far more leftist in economic policy than the DPP. The policy spectrum of the four parties can be seen in Figure 1.[13]

II. EXPERIMENTAL DESIGN

A. Schedule of Experiment

We recruited our subjects mostly from National Taiwan University (NTU) and the surrounding university area but prevented from participation those who were not

---

election required voters to vote for a political party as well as for a candidate from their local constituency. NPP won 6.11% of total votes and 2 seats in the PR block while GSD won only 2.53% and failed to secure any seats (a party must obtain at least 5% of party votes to secure seats). https://en.wikipedia.org/wiki/2016_Taiwan_legislative_election

[13]According to Wikipedia, KMT is positioned center-right; DPP, center to center-left; NPP and GSD, both center-left. https://en.wikipedia.org/wiki/List_of_political_parties_in_Taiwan

eligible to vote (in Taiwan, younger than 20). We conducted the Initial Survey in November 2015. A total of 224 subjects were brought to NTU to complete the survey, but only 212 expressed an intention to participate in the subsequent experiment.[14] The Initial Survey included questions regarding subjects' background information, political preferences, media consumption behavior, confidence in their beliefs, and political knowledge.[15]

TABLE 1

Number of Subjects in Each Treatment Group (by Block)

	Control	KMT	DPP	Third	Total
# from DPP Block	44	42	44	43	173
# from KMT Block	9	10	10	10	39
# of subjects	53	52	54	53	212

The subjects who decided to join the experiment were randomly assigned to one of four treatments: the KMT, DPP, Third-Party, or the Control group. For this purpose, we employed block randomization, in which we first divided the subjects into two blocks of "KMT" and "DPP" according to their party preferences in the Initial Survey. Although the number of subjects who indicated their support of the KMT in the Initial Survey was relatively small, we also assigned to the KMT block those subjects who identified themselves as preferring the parties ideologically close to the KMT; all other subjects were assigned to the DPP block.[16] Within each block, we randomly allocated the subjects into four treatment groups, and Table 1 shows the resulting allocation of the subjects.

Table 2 shows sample statistics from the Initial Survey, broken down by treatment group. Our sample consists mostly of students (86%) and is much more likely to prefer candidates/parties with liberal ideology compared to the general electorate.[17] The lowest p-value for a test of independence across (treatment) groups was 0.214 (for age younger than 21). Using the treatment assignment as the dependent variable in a multinomial logit model, we obtained the p-value for the significance of the

---

[14]Initial Survey was a part of an introductory meeting in which we also explained to the recruited subjects the details of the following experiment and they had a chance to consider whether to participate or not. The demographic information of those who joined the survey (and decided to continue to the experiment) can be found in Table 2.

[15]The complete survey questions can be found in the online appendix.

[16]Specifically, subjects preferring KMT, People First Party or New Party were assigned to the KMT block while all others, to the DPP block.

[17]For the outcomes of the 2016 Elections, refer to the previous section about the background of Taiwanese politics and elections.

TABLE 2

Summary Statistics from Initial Survey

	Control	KMT	DPP	Third	All	p-value
	(1)	(2)	(3)	(4)	(5)	(6)
% male	39.62	44.23	53.70	41.51	44.81	0.467
% student	88.68	90.83	81.48	83.02	85.85	0.489
% NTU	58.49	63.46	68.52	64.15	63.68	0.760
% age>25	22.64	19.23	24.07	28.30	23.58	0.745
% age<21	33.96	28.85	31.48	16.98	27.83	0.214
% from Taipei	54.72	42.31	59.26	56.60	53.30	0.312
% wage> 40,000	7.55	5.77	7.41	13.21	8.49	0.541
% voted before	54.72	46.15	51.85	62.26	53.77	0.415
% support *Chu*	7.55	13.46	7.41	11.32	9.91	0.703
% support *Tsai*	83.02	80.77	85.19	81.13	82.55	0.994
% support KMT	15.09	15.38	18.52	16.98	16.51	0.970
% support DPP	35.85	21.15	33.33	24.53	28.77	0.441
% support GSD	26.42	21.15	18.52	20.75	21.70	0.844
% support NPP	11.32	23.08	16.67	16.98	16.98	0.544
# of subjects	53	52	54	53	212	

Note. (i) p-values for chi-squared tests of independence between treatments are reported in column 6.
(ii) The 8th through 14th rows are based on the preferences for presidential candidates and political parties reported in the Initial Survey.
(iii) Multinomial logit models predicting assignment to treatment using all demographic variables above and initial preference for presidential candidates yield a chi-squared test value of 23.84 ($d.f. = 33$, $p = 0.8787$), and using all demographic variables above and initial preference for parties yield a chi-squared test value of 25.84 ($d.f. = 36$, $p = 0.8949$).

preference for presidential candidates as $p = 0.879$, and of the preference for political parties as $p = 0.895$.[18]

During the one and a half months before the Elections, we conducted three on-site sessions and two online sessions, each of the latter held between the adjacent on-site sessions. The timeline of the experiment, including all on-site and online quiz sessions, is depicted in Figure 2. In each on-site session, subjects were asked to come to a classroom at NTU and to take a quiz about ten articles selected specifically for each treatment group and sent in advance.[19] For each article, we prepared 3 multiple-choice comprehension questions (hence 30 questions in total) which could

---

[18]We obtained similar results about the summary statistics from the Final Survey.

[19]The treatment articles were also printed out and distributed at the on-site quiz sessions.

FIGURE 2

Schedule of Experiment
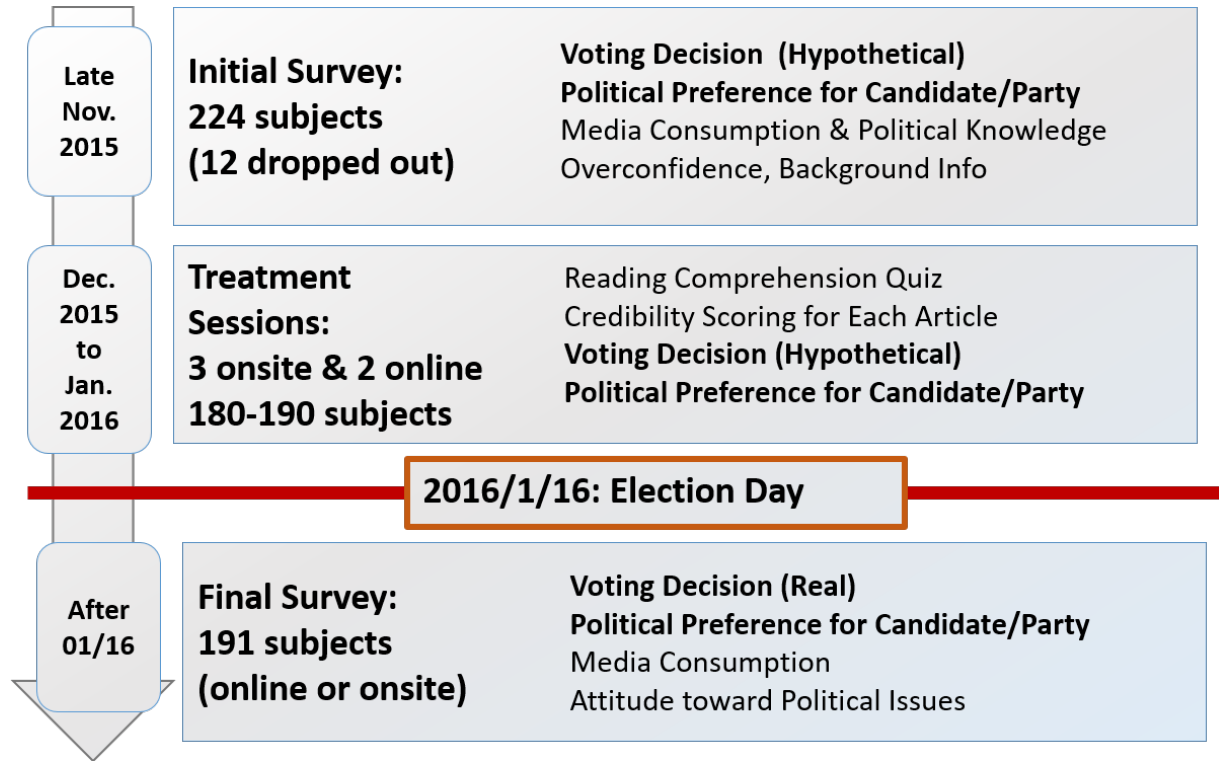
not be answered correctly without actually having read the articles thoroughly. After subjects answered all comprehension questions, we collected the article copies and asked subjects to answer 10 more questions testing their memory of the articles. The on-site sessions also included a survey that was similar to the initial one. In the online sessions, the subjects in each treatment group were given only ten multiple-choice comprehension questions from five articles, two for each article, without including any survey.

After the Elections, we brought the subjects back to join the Final Survey, in which they were asked to report, among other things, their real voting decisions in presidential and party voting.[20] If a subject abstained, we asked him/her to answer questions about hypothetical voting decisions, "if you participated in the Elections,

---

[20]The Final Survey also included most questions that were asked in the Initial Survey and the follow-up surveys in the on-site sessions.

for which candidate/party would you vote?" Those subjects who could not attend the final session were allowed to complete the Final Survey online. More than 95% of the subjects finished the survey within two weeks after the Elections.

TABLE 3

Session Summary

	# Articles	# Subjects	Show-up[a]	# Correct	# Questions	Avg. Payoff[a]
Initial Survey	n/a	224	100	n/a	n/a	100
On-site 1	10	190	100	33.82 (2.99)	40	268.61
Online 1	5	186	none	9.01 (1.14)	10	45.05
On-site 2	10	187	100	34.63 (3.02)	40	275.08
Online 2	5	179	none	9.13 (1.14)	10	45.64
On-site 3	10	182	150	34.71 (3.28)	40	323.70
Final Survey	n/a	190	200	n/a	n/a	385.26[b]

NT$200 bonus for attending all on-site and online sessions.
NT$100 bonus for attending at least two on-site sessions.

Note. The numbers in parentheses are standard deviations.
a. Show-up and average payoffs are in NT dollars.
b. The payment from the Final Survey includes the bonus.

The payoff consists of an NT$100 show-up fee for the Initial Survey and each on-site session (with an NT$200 show-up fee for the Final Survey), NT$5 for each correct answer to a quiz question, and a bonus payment for participation in multiple sessions.[21] Table 3 summarizes all sessions and the (average) payoffs thereof.

B. Treatment Articles

We assigned four sets of treatment articles: pro-KMT articles for the KMT group, pro-DPP articles for the DPP group, pro-third-party articles for the Third-Party group, and articles unrelated to politics for the Control group.

We selected a different set of news articles for each treatment group, and the main news sources were newspapers and internet media.[22] Specifically, for the KMT

---

[21]US$1 is worth NT$30-NT$32 depending on the current exchange rates. The bonus is given to encourage the subjects to participate in as much sessions as possible; NT$200 for participation in all on-site and online sessions, NT$100 for participation in at least two on-site sessions, and NT$50 for participation in the third on-site session. Also note that we set a significantly higher show-up payment for the Final Survey.

[22]Four major newspapers in Taiwan are United Daily, China Times, Liberty Times and Apple

treatment, we selected articles mainly from the United Daily and the China Times, as well as several from the China News Agency, all of which were favorable to the previous KMT government. For the DPP treatment, we selected all articles from the Liberty Times. For the Third-Party treatment, we selected articles from various sources, including online news media such as Storm Media and Nownews and major newspapers (excluding the China Times and the United Daily), since the information about the new third parties was spread throughout a wide range of sources. These articles usually promoted policies or candidates whose ideology was close to those of the newspaper that published the articles or contained negative advertisements regarding the ideologically opposite candidates and their camps. For the Control group, articles were selected mainly from the Apple Daily, which is thought to be neither "pro-KMT" nor "pro-DPP"; the articles were about sports, science, or entertainment, with no political content.

In each of the three on-site sessions, individual subject was given ten articles to read; nine of them were treatment-specific articles, and there was also an article that was common to all treatment groups. In each (on-site) session, a common article was chosen from the British Broadcasting Corporation (BBC), the content of which involved foreign politics and was totally unrelated to the Taiwanese Elections. The purpose of adding a common article was to see whether there was any difference between the credibility scores of treatment and common articles.[23] As for the online sessions, we sent five articles to each subject, all of which were treatment-specific.

We tried to balance the content, intensity and length of the assigned articles across the treatment groups. During the campaign, politicians or parties raised certain policy issues or engaged in negative advertising about the opposite candidates. To avoid possible asymmetric effects across treatments from a random flow of issues, we selected important issues first, and then chose articles about those issues for each treatment group.

Table 4 lists the chosen issues and the number of articles for each issue in each treatment. The issues in the above table were either raised by more than two candidates or parties or were covered by most newspapers. We have chosen policy issues (social welfare, public housing, labor, education, etc.), candidates' personal issues (*e.g.*, appropriation of military housing by *Chu*'s vice president running mate

---

Daily from which we selected most of our treatment (and control) articles, except for the Third-Party treatment in which we actively used internet media.

[23]Besides the quiz questions, we asked subjects to give a credibility score to each article on a 1-8 scale. It turns out that the credibility scores of the DPP and Third-party articles are significantly lower than those of the Control articles, and that the scores of the KMT articles are even (significantly) lower than those of the DPP and Third articles (the data about credibility scores are available upon request).

TABLE 4

News Issues in the Treatments

News Issues	KMT	DPP	Third
China-Related Economic Issue	6	6	4
Congress Reform	4	4	3
Labor	4	4	5
Energy and Environment	1	1	2
Education	1	1	1
Social Welfare and Equity Issues	3	3	1
Presidential Debates on TV	6	6	0
Positive Ad. or Introduction	3	3	14
Negative Advertising	5	5	3
Editorial	4	4	4
BBC Articles (common)	3	3	3
Total	40	40	40

Wang), and the candidates' televised debates.[24] We avoided articles that raised multiple issues at the same time. Particularly in the KMT and DPP treatments, if we chose for a treatment an article on negative advertising about the opposite candidate, we also included an article about counterattacks in the other treatment. We included the same number of editorials for each treatment.

In the Third-Party treatment, the chosen articles were primarily about two parties: the Green Party and Social Democratic Party (GSD) and the New Power Party (NPP).[25] We also tried to include articles also for the Third-Party treatment in each issue category and were able to find appropriate articles in most cases. However, some issues that KMT and DPP frequently debated with each other were not issues that interested the third parties (*e.g.*, cross-strait relations between Taiwan and China). In this case, the issue category was filled by other articles promoting the third parties.

We also controlled the time frame for the selection of news articles. Specifically, for the first on-site session, we selected only articles published within one month before the first day of the session. For the following (on-site and online) sessions,

---

[24]Since there's no presidential candidate representing major third parties and joining the TV debates, we included more articles about positive advertising of these new parties to compensate the absence of articles for them in the category of TV debates.

[25]These two parties are the newest parties in Taiwanese politics, emerging after the 2014 Sun Flower Movement, and our subjects as well as general public have relatively high interests in these parties at the time of the 2016 Elections.

the time frame was shortened to simulate real news consumption and information updates. For each session, the time period for the choice of news articles was less than two weeks, and most articles were collected during the week before a quiz session.

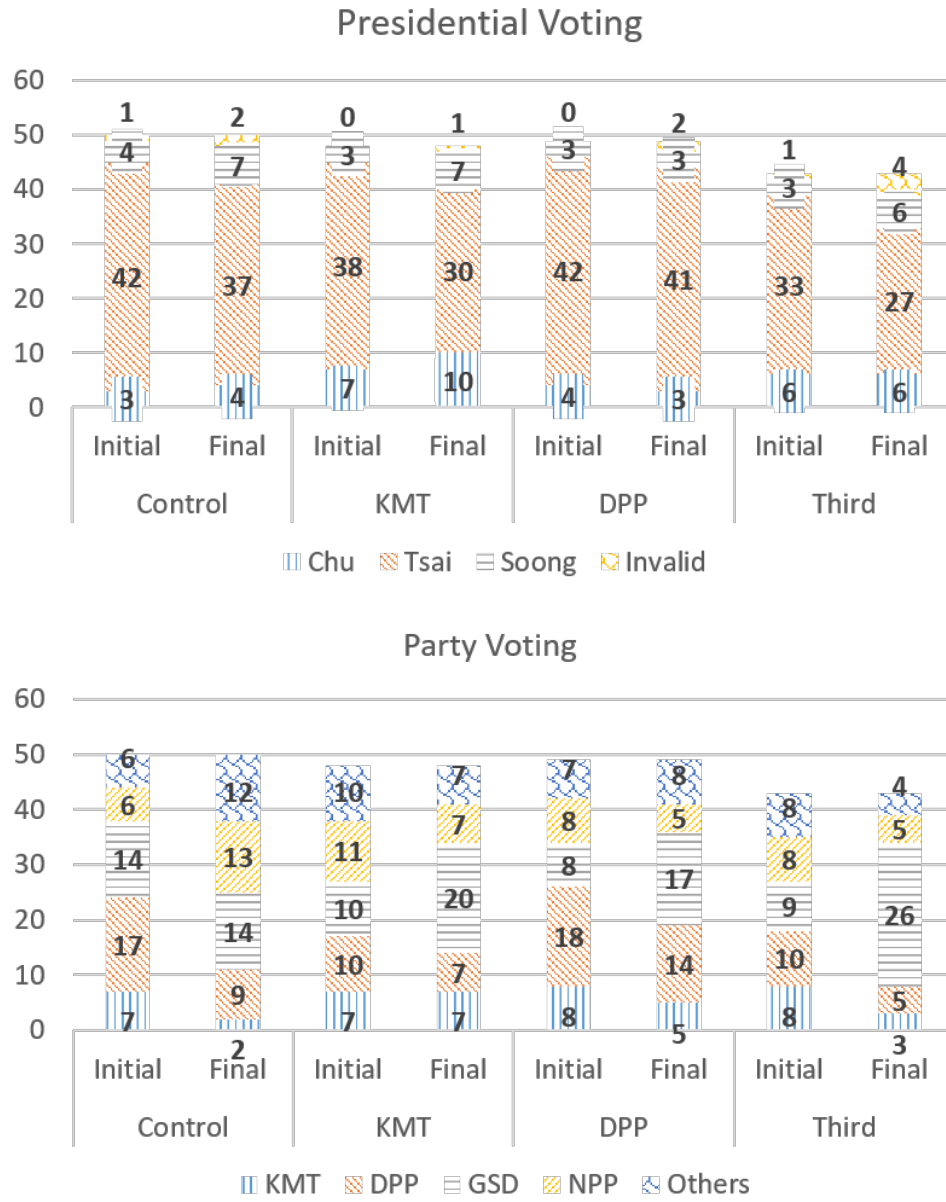# III.   EXPERIMENTAL RESULTS

A.   Outcome

We first show the change in the number of votes (hypothetical or actual) for the presidential candidates and for the political parties (Figure 3) that could be attributable to our treatments. The initial support is based on the hypothetical voting decisions reported in the Initial Survey,[26] while the final votes reflect the actual voting decisions in the 2016 Elections, as reported in the Final Survey.

As shown in Figure 3, support for the conservative KMT candidate *Chu* increased only in the KMT treatment group, whereas it decreased or remained the same in the other (treatment/control) groups. The support for the liberal DPP candidate *Tsai* tended to decrease in all groups, but it dropped most significantly among the KMT and the Third-Party groups, while the drop was only marginal in the DPP group. Although not all treatments succeeded in increasing the support for the candidates they were targeting, these outcomes are broadly in line with our intended treatment effects.

Figure 3 also shows similar outcomes for the party votes. The support for KMT clearly dropped in all groups except for the KMT group, which demonstrated only a negligible drop. The drop in the support for DPP was relatively small in the DPP group, compared especially with the corresponding drops in the KMT and the Third-Party groups. The support for GSD tended to increase in all treatment groups, but the extent of increase was most noticeable in the Third-Party group. These results about party voting can be understood as the persuasion effect of the Third-Party treatment, which will be explored in more detail in subsequent sections.

---

[26]More precisely, we included in the Initial Survey the questions, saying "If the election were held today, which candidate/political party would you vote for?", and the data about initial support are based on the subjects' choices in these questions among three presidential candidates in Figure 3 or among 21 political parties, including the four major ones in Figure 3.

FIGURE 3
Votes for President and Party

Presidential Voting

Legend: Chu, Tsai, Soong, Invalid

Control: Initial — 1, 4, 42, 3; Final — 2, 7, 37, 4
KMT: Initial — 0, 3, 38, 7; Final — 1, 7, 30, 10
DPP: Initial — 0, 3, 42, 4; Final — 2, 3, 41, 3
Third: Initial — 1, 3, 33, 6; Final — 4, 6, 27, 6

Party Voting

Legend: KMT, DPP, GSD, NPP, Others

Control: Initial — 7, 17, 14, 6, 6; Final — 2, 9, 14, 13, 12
KMT: Initial — 7, 10, 10, 11, 10; Final — 7, 7, 20, 7
DPP: Initial — 8, 18, 8, 8, 7; Final — 5, 14, 17, 5, 8
Third: Initial — 8, 10, 9, 8, 8; Final — 3, 5, 26, 5, 4

15

B.   Baseline Treatment Effects

We demonstrate the effects of partisan news articles on presidential voting (Table 5) and on party voting (Table 6) using linear regression.[27] This baseline analysis includes all 190 subjects who participated in the Final Survey.[28]

As shown in Table 5, the support for *Chu* increased with the KMT treatment, while it decreased with the DPP treatment (column 1). Although these effects are *not* statistically significant, relative to the control group, the coefficients of the two treatments (KMT and DPP) are indeed significantly different from each other,[29] as shown in the bottom panel of column 1. Because of this significant difference, we can conclude that the two treatments worked in opposite directions to each other on supporting the candidate *Chu*. Similarly, the support for *Tsai* decreased with both the KMT and Third-Party treatments, while it increased with the DPP treatment, again with significant differences between the DPP coefficient on the one hand and the KMT and Third coefficients, respectively, on the other (column 2). The reason why the Third treatment decreased support for *Tsai* could be due to the competition between DPP and third (minor) parties for left-leaning supporters during the campaigns of the 2016 Elections.

The effects on party voting are shown in Table 6. We can see that the KMT treatment has significantly increased the support for the KMT party, while the Third-Party treatment has significantly increased the support for the GSD party. Although there was a general tendency of increase in the support for GSD in all treatment groups (as shown in Figure 3 and by the positive coefficients in column 3), the effect of the Third-Party treatment was alone significant and much greater in magnitude in favor of GSD not only relative to the control group but also relative to the DPP and the KMT groups (the bottom panel of column 3). As we will see later, this result

---

[27]The vote choices (dependent variables) used in the analysis of this section and all subsequent sections are based on the actual voting decisions or hypothetical decisions that one would have made if one turned out to vote, both as reported in the Final Survey. As the sample size is small, the turnout among our subjects is high (91% overall), and the results (baseline, reinforcement, persuasion and swing voter effects) with only actual voting decisions are basically the same, we don't exclude the decisions of the subjects who abstained. The results from alternative probit/logit specifications are similar, including statistical significance (all alternative results are available upon request).

[28]The number of subjects who completed the Final Survey was actually 191, but a subject was excluded further from the analysis since s/he participated only in the Initial and the Final Survey without attending any intermediate treatment sessions.

[29]This means that we would have a significant coefficient on the DPP treatment in an alternative specification of the regression model in which the reference group is the KMT treatment group, rather than the control group.

TABLE 5

Baseline Effects: Presidential Voting (OLS)

VARIABLES	(1) Vote for *Chu*	(2) Vote for *Tsai*	(3) Vote for *Soong*
KMT Treatment	0.079	-0.072	0.010
	(0.064)	(0.082)	(0.067)
DPP Treatment	-0.031	0.075	-0.057
	(0.046)	(0.070)	(0.056)
Third Treatment	0.006	-0.071	0.014
	(0.054)	(0.088)	(0.068)
Constant	0.061	0.524	0.026
	(0.135)	(0.451)	(0.178)
Observations	190	190	190
R-squared	0.463	0.366	0.218
H0: KMT−DPP= 0	0.109**	-0.148**	0.067
H0: DPP−Third= 0	-0.037	0.147*	-0.071
H0: KMT−Third= 0	0.072	-0.001	-0.004

Note. (i) Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.
(ii) The last three rows for differences in effects between treatments.
(iii) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month, whether they have voted before, and initial political preference.

is driven by a strong persuasive effect of the Third treatment working on those who initially didn't support GSD. Furthermore, the DPP treatment had a positive effect while the Third treatment had a negative effect on support for DPP (although the difference of these two effects were not significant).

In sum, the signs of the effects shown in Table 5 were mostly in line with our intended treatment effects and the key treatment effects working in opposite directions to each other were significantly different from each other. This finding we understand as evidence that media slant can matter in subjects' vote choices, unlike Gerber et al. (2009) who found that both *Washington Times* and *Washington Post* have increased support for the Democratic candidate.[30] We will further explore possible

---

[30]The results for party voting was closer to those of Gerber et al. (2009) in that both KMT and DPP treatments failed to decrease support for the competing parties although the increase in support for the target parties aimed by these treatments was much greater in magnitude than that for the competing parties (Table 6).

TABLE 6

Baseline Effects: Party Voting (OLS)

VARIABLES	(1) Vote for KMT	(2) for DPP	(3) for GSD	(4) for NPP	(5) for GSD+NPP
KMT Treatment	0.110*	0.022	0.097	-0.114	-0.017
	(0.059)	(0.066)	(0.080)	(0.082)	(0.098)
DPP Treatment	0.055	0.071	0.101	-0.172**	-0.070
	(0.050)	(0.074)	(0.090)	(0.077)	(0.101)
Third Treatment	0.003	-0.031	0.323***	-0.160**	0.163*
	(0.047)	(0.069)	(0.085)	(0.079)	(0.096)
Constant	0.044	0.039	0.148	0.475**	0.623***
	(0.143)	(0.142)	(0.195)	(0.214)	(0.233)
Observations	190	190	190	190	190
R-squared	0.335	0.305	0.359	0.159	0.210
H0: KMT−DPP= 0	0.055	-0.049	-0.005	0.058	0.053
H0: DPP−Third= 0	0.052	0.102	-0.222**	-0.012	-0.233**
H0: KMT−Third= 0	0.107*	0.053	-0.226***	0.046	-0.180**

Note. (i) Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.
(ii) The last three rows for differences in effects between treatments.
(iii) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month, whether they have voted before, and initial political preference.

explanations for these effects in the next section - namely, the effects on presidential voting were mainly to reinforce the existing preferences of our subjects whereas those on party voting, to change their voting intentions. We will also show that the baseline (Table 5) and reinforcement (Table 8) effects on presidential voting were mainly driven by the subjects whose preferences for presidential candidates were not fixed in the beginning.

C.   Reinforcement and Persuasion Effects

The nature of our treatment effects could be dependent upon subjects' political preferences reported in the Initial Survey. Subjects who initially preferred the conservative candidate, *Chu* may have reacted differently to the same KMT treatment,

for example, than those who initially preferred the liberal candidate, *Tsai*.[31]

In this section, we would like to distinguish between two important categories of potential treatment effects and investigate them separately. First, if the tone of the assigned newspaper articles coincides with one's own political ideology, such articles can have the effect of reinforcing the subject's existing preferences, which we can call a *reinforcement effect*. Second, if the information in the assigned articles is at odds with one's own ideology, but a subject is nonetheless influenced by the articles and changes his initial voting intention, then we can call this a *persuasion effect*.

TABLE 7

Who Received the "Same" Treatment?

	Control	KMT	DPP	Third
Initial *Chu*	Control (3)	Same Treat (7)	Different Treat (4)	Different Treat (6)
Initial *Tsai*	Control (42)	Different Treat (38)	Same Treat (42)	Different Treat (33)
Initial Others	Control (5)	Different Treat (3)	Different Treat (3)	Different Treat (4)

Note. Number of observations in parenthesis.

In Table 7, receiving the "same" treatment means that the information in the treated articles is consistent with one's ideology. Thus, if one prefers *Chu* and is assigned to the KMT treatment or prefers *Tsai* and is assigned to the DPP treatment, we define such situations as the subject receiving the *same* treatment; otherwise, we say that the subject receives the *different* treatment (except for the Control group). Table 7 shows a complete picture of who received the *same* treatment and who received the *different* treatment.

We find that our treatments have a very strong reinforcement effect with regard to presidential voting.[32] When subjects are treated with the articles that are consistent with their ideology, they are significantly more likely to vote for the (presidential)

---

[31]Additional media consumption triggered by our treatment can be affected by *confirmation bias* which means actively seeking information that matches one's prior, or ignoring information counter to it (Ortoleva and Snowberg 2015). With regard to our treatments (no matter whether they lead to reinforcement or persuasion effects), confirmation bias is a confounding factor as our design doesn't have a complete control over how subjects would react after they read the treated articles. Our treatments give monetary incentives that can counter to some degree subjects' selective consumption of news information that stems from confirmation bias. The results from our mediation analysis also show that the indirect effects through additional media consumption are negligible (see the appendix).

[32]We also examined similar effects of the *same* treatment for party voting, but couldn't find effects as strong as those for presidential voting. We found a significant effect of the same treatment only among those who initially preferred GSD.

TABLE 8

Reinforcement Effects: Presidential Voting (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
			Vote for Same President			
Same Treatment	0.189**			0.146*		
	(0.077)			(0.077)		
i.*Chu* & t.KMT		0.117	0.113		0.061	0.062
		(0.149)	(0.150)		(0.163)	(0.164)
i.*Tsai* & t.DPP		0.201***	0.201***		0.162**	0.162**
		(0.076)	(0.077)		(0.075)	(0.076)
i.*Tsai* & t.KMT			0.082			0.010
			(0.096)			(0.097)
i.*Chu* & t.DPP			0.061			-0.049
			(0.261)			(0.228)
Different Treatment	0.056	0.057	0.038	0.001	0.005	
	(0.078)	(0.078)	(0.089)	(0.094)	(0.094)	
Constant	0.949***	0.946***	0.963***	0.737***	0.733***	0.729***
	(0.195)	(0.194)	(0.205)	(0.232)	(0.230)	(0.233)
Observations	190	190	190	136	136	136
R-squared	0.056	0.058	0.059	0.051	0.054	0.055

Note. (i) The subsample of 136 subjects in columns 4 through 6 includes initial *Chu* and *Tsai* supporters only, in Control, KMT and DPP (but *not* Third) groups.
(ii) i represents initial preference, and t represents assigned treatment in the name of variables.
(iii) Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
(iv) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month, whether they have voted before.

candidate whom they originally preferred (19% more in column 1 of Table 8). This reinforcement effect is most prominent among the initial *Tsai* supporters when they received the DPP treatment (columns 2, 3, 5 and 6 in the same table). Compared with the *Chu* supporters treated with pro-KMT articles, the reinforcement effect found among the *Tsai* supporters treated with pro-DPP articles is not only statistically significant but also is approximately two or three times larger than the same effect among the former-*Chu*-supporter group.[33]

---

[33]The fact that the DPP treatment resulted in a significant reinforcement effect while the KMT treatment didn't casts doubt upon the view that our results might be derived from experimenter demand effect. Although there is a reason to believe that the demand effect be positively correlated with our treatment effects, - the demand effect is considered as a problem only when it is positively

The leftmost three columns in Table 8 show the results from the same analysis based on a subsample consisting only of the initial *Chu* and *Tsai* supporters assigned to the Control, KMT and DPP (but not Third-Party) treatment groups. This approach enables us to focus on the two major preference groups receiving either the same or the different treatment. As shown in the table, the results from this subsample are essentially the same as those from the full sample.

We next turn to the persuasion effect, which is found mainly for party voting. When we examine the (persuasion) effect of differential treatments in increasing the support for a party, our definition of the persuasion effect naturally leads us to restrict the analysis to those who initially did not support that party; e.g., the 160 subjects in column 1 of Table 9 are those who initially revealed themselves as not supporting the KMT party. Therefore, this table tells us which treatments make subjects change their original voting intentions and choose to vote for another party. According to Table 9, the Third-Party treatment has a strong persuasive effect in making subjects change their voting intentions in favor of GSD. This treatment effect is significant not only with respect to the control group but also with respect to the KMT group (the bottom panel of column 3).[34] Interestingly, the DPP treatment is also shown to increase support for GSD, and to decrease support for NPP.

In sum, our findings suggest that the media has the effect of reinforcing the existing preferences for the presidential candidates from the major parties whose ideology and policies are already well known to the public. Our study shows that the media can also have a persuasion effect, especially for new parties such as GSD, as subjects learn more from the new information provided by the media. The results thus suggest (quite intuitive) conditions under which the media can have strong persuasive effects; if the amount of information about parties or candidates is relatively small, the media information supporting these parties or candidates can indeed change people's voting intentions within a relatively short period of time.

---

correlated with the true experimental objectives' predictions (Zizzo 2010) - then the demand effect can't explain why the observed reinforcement effect is highly selective. Also, the decreasing tendency of the support for *Tsai* and the increasing tendency of the support for GSD in all treatment groups (Figure 3) are at odds with the hypothesis of the demand effect.

[34]In view of the fact that the difference between KMT and DPP groups is not significant in increasing support for GSD, the difference between DPP and Third groups must be close to being significant (the bottom panel of column 3 in Table 9). The latter difference is indeed significant (at the 10% level) if we don't control initial political preferences.

TABLE 9

Persuasion Effects: Party Voting (OLS)

VARIABLES	(1) Vote for KMT	(2) for DPP	(3) for GSD	(4) for NPP
KMT Treatment	0.001	0.021	0.076	-0.042
	(0.053)	(0.047)	(0.094)	(0.089)
DPP Treatment	-0.047	0.042	0.187**	-0.138*
	(0.036)	(0.059)	(0.091)	(0.079)
Third Treatment	-0.051	0.018	0.348***	-0.124
	(0.035)	(0.052)	(0.103)	(0.081)
i.KMT		0.071*	-0.269**	0.086
		(0.042)	(0.116)	(0.096)
i.DPP	-0.083		-0.232**	0.102
	(0.054)		(0.104)	(0.079)
i.GSD	-0.093*	0.049		-0.054
	(0.052)	(0.038)		(0.060)
i.NPP	-0.094*	0.112*	-0.056	
	(0.052)	(0.062)	(0.117)	
Constant	0.168	0.006	0.062	0.374
	(0.111)	(0.086)	(0.224)	(0.229)
Observations	160	135	149	157
R-squared	0.096	0.067	0.274	0.123
H0: KMT−DPP= 0	0.048	-0.022	-0.112	0.096
H0: DPP−Third= 0	0.004	0.024	-0.161	-0.014
H0: KMT−Third= 0	0.052	0.002	-0.273***	0.083

Note. (i) i represents initial preference in the name of variables.

(ii) Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

(iii) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month, whether they have voted before, and initial political preference.

D. Decided vs. Undecided Voters

One question included in the Initial Survey was whether subjects decided who to vote for in the presidential election. Table 10 summarizes the answers to this question. There were 73 undecided voters about presidential voting, slightly less than 40% of the entire sample. As will be shown below, it is this subsample of

22

undecided subjects who delivered our baseline and reinforcement treatment effects.

TABLE 10

Decided vs. Undecided Voters in Presidential Election

	Control	KMT	DPP	Third	Total
Chu	0	4	3	1	8
Tsai	28	27	28	21	104
Soong	1	3	0	1	5
Undecided	21	14	18	20	73
Total	50	48	49	43	190

Table 11 shows our baseline results about treatment effects, similar to those in Table 5, but now divided between decided and undecided subsamples. It is clear that the patterns of positive and negative treatment effects observed among the undecided subjects largely coincide with those found among the entire sample in Table 5, but that these positive and negative effects disappear among the decided subjects. Moreover, the magnitude of treatment effects for the undecided subjects is greater than that for the whole sample (this difference happens as a matter of course since the decided subjects can only dilute the treatment effects), and some treatment effects now become significant, for example, the negative effect of the KMT treatment on the candidate *Tsai* (column 3). Importantly, significant differences between treatment groups, which were originally found in the entire sample (Table 5), are again found to be statistically significant only in the undecided subsample but *not* in the decided one (see the bottom panel).[35] This result provides strong evidence that they are undecided subjects or swing voters who are mainly influenced by our media treatments.

We also conduct an analysis of the reinforcement effect, parallel to that in Table 8, again divided between decided and undecided subjects. Table 12 clearly shows that the reinforcement effect is also observed only among the undecided subjects, whether the effect is exhibited by the entire undecided subsample (column 1) or by those who originally preferred *Tsai* but were not firmly decided (columns 3 and 5). In addition, we again find that the magnitude of the reinforcement effect or the *same*-treatment effect is much greater in the undecided subsample than in the entire sample. We can also conclude that these findings support the intuitive idea that those who are most likely to be influenced by the treatment newspaper articles

---

[35]For example, the differences between KMT and DPP coefficients are significant for both entire and undecided subjects, as shown in the bottom panels of Tables 5 and 11, respectively, but *not* for the decided subjects.

TABLE 11

Decided vs. Undecided: Baseline Effect (OLS)

VARIABLES	(1) Vote for *Chu*	(2)	(3) Vote for *Tsai*	(4)	(5) Vote for *Soong*	(6)
KMT Treatment	0.260	0.021	-0.353**	0.004	0.111	-0.025
	(0.175)	(0.019)	(0.170)	(0.035)	(0.165)	(0.030)
DPP Treatment	-0.071	0.002	0.154	0.001	-0.086	-0.003
	(0.111)	(0.019)	(0.164)	(0.045)	(0.143)	(0.041)
Third Treatment	-0.013	0.062	-0.130	-0.026	0.066	-0.036
	(0.107)	(0.050)	(0.153)	(0.060)	(0.134)	(0.034)
Constant	0.299	-0.096	0.358	0.100	-0.056	0.996***
	(0.260)	(0.090)	(0.628)	(0.093)	(0.438)	(0.028)
Observations	73	117	73	117	73	117
R-squared	0.384	0.776	0.313	0.722	0.195	0.717
Subgroup	Undecided	Decided	Undecided	Decided	Undecided	Decided
H0: KMT−DPP= 0	0.331**	0.020	-0.506***	0.003	0.197	-0.023
H0: DPP−Third= 0	-0.058	-0.060	0.284*	0.026	-0.152	0.034
H0: KMT−Third= 0	0.273*	-0.041	-0.222	0.030	0.045	0.011

Note. (i) Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
(ii) The last three rows for differences in effects between treatments.
(iii) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month, whether they have voted before, and initial political preference.

and to confirm their original preferences are the subjects whose preferences are not decided for sure in the beginning.

It is unfortunate that we failed to include a similar question about party voting - whether subjects have decided for which party to vote - in the Initial Survey and thus are unable to analyze the role of undecided subjects with regard to persuasion effect.

E.   Persuasion Rate

Although it is not easy to compare estimates of media effects across different studies, DellaVigna and Kaplan (2007) and DellaVigna and Gentzkow (2010) introduce a *persuasion rate* that estimates the percentage of receivers who change the behavior among those who receive a message (in our case, a treatment) and are not already persuaded. Those studies do not claim that the persuasion rate is a funda-

TABLE 12

Decided vs. Undecided: Reinforcement Effect (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
			Vote for Same President			
Same Treatment	0.418**	0.002				
	(0.159)	(0.046)				
i.*Chu* & t.KMT			0.321	0.044	0.381	0.050
			(0.280)	(0.045)	(0.291)	(0.048)
i.*Tsai* & t.DPP			0.439**	-0.004	0.436**	-0.002
			(0.172)	(0.048)	(0.174)	(0.049)
i.*Tsai* & t.KMT					-0.156	0.021
					(0.187)	(0.029)
i.*Chu* & t.DPP					0.523***	-0.301
					(0.175)	(0.286)
Different Treatment	0.057	-0.005	0.059	-0.005	0.136	0.002
	(0.143)	(0.041)	(0.144)	(0.041)	(0.160)	(0.061)
Constant	0.609	1.058***	0.604	1.058***	0.551	1.026***
	(0.417)	(0.086)	(0.421)	(0.086)	(0.432)	(0.123)
Observations	73	117	73	117	73	117
R-squared	0.218	0.054	0.219	0.056	0.262	0.121
Subgroup	Undecided	Decided	Undecided	Decided	Undecided	Decided

Note. (i) i represents initial preference and t represents assigned treatment in the name of variables.
(ii) Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.
(iii) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month, and whether they have voted before.

mental parameter that is invariant over time or between contexts. On the contrary, the persuasion rate merely captures the average effect of persuasive communications, thereby enabling us to compare those effects on equal footing.

In a setting with a binary behavioral outcome (in our case, supporting or not supporting a particular candidate or a party), a treatment group T, and a control group C, DellaVigna and Gentzkow (2010) define the persuasion rate f (in percent terms) as

$$f = 100 \times \frac{y_T - y_C}{e_T - e_C} \frac{1}{1 - y_0}$$

where e_i is the share of group i receiving the message/treatment, y_i is the share of group i adopting the behavior of interest (i.e., voting for or supporting a particular

TABLE 13

Persuasion Rates

Treatment	Variable[a]	Sample size[c]	Effect size[b] $y_T - y_C$	Initial support y_0	Persuasion rate f
KMT	*Chu*	190	0.079	9.91%	8.77%
DPP	*Tsai*	190	0.075	82.55%	42.97%
KMT	KMT	190	0.110	16.51%	13.18%
DPP	DPP	190	0.071	28.77%	9.97%
Third	GSD	190	0.323	21.70%	41.25%
Third	NPP	190	-0.160	16.98%	-19.27%
Third	GSD+NPP	190	0.163	38.68%	26.58%

Note. a. The variables to be affected are the vote shares or the voting intentions (in case of abstention) for the relevant candidates or parties.
b. Effect size is approximated by the regression coefficient in Tables 5 or 6.
c. The coefficients in Tables 5 and 6 used all 190 subjects in the Final Survey, i.e., our full sample size.

candidate or a party), and y_0 is the share that would adopt the behavior if there were no message/treatment.[36] Since we have the data about y_0, we calculate it as the share of all subjects who revealed a preference for the relevant candidate or party in the Initial Survey. We use as estimates for effect size $y_T - y_C$ the baseline treatment effects in Tables 5 or 6. All those in the Control group received no political articles, while all those in treatment groups read the assigned (political) articles, hence $e_C = 0$ and $e_T = 1$, respectively. We report the estimates of the persuasion rates of our treatments in Table 13.

The persuasion rate $f = 8.77$, for example, means that the persuasive effect of the KMT treatment represents the 8.77 percent of the subjects who initially did not support *Chu* but now voted for or support him, affected by the treatment. Although the estimated effect sizes of the KMT treatment, dircted at *Chu*, and the DPP treatment, directed at *Tsai*, are similar, the levels of initial support for the two candidates are vastly different among our subjects, resulting in a dramatic difference between the corresponding persuasion rates ($f = 8.77$ vs 42.97). Since there are only a few subjects who did not support *Tsai* (those to be persuaded) in the beginning, a small change in vote choices or voting intention is translated into a substantial difference in persuasion rates. In this way, even if the DPP coefficient

---

[36]If we have used only actual voting decisions in our analysis (to produce the estimated effect size in Table 13), this formula for persuasion rate should have been modified to accommodate turnout rate that is less than one: see the appendix of DellaVigna and Gentzkow (2010).

affecting the likelihood of voting for *Tsai* is *not* significant in Table 5, its (average) persuasive effect can nevertheless be very large. Our subjects exposed to the Third-Party treatment are significantly more likely to vote for the GSD ($f = 41.25$) and for the GSD and NPP combined ($f = 26.58$). Considering the medium level of initial support for these two parties, the persuasive effects of the Third-Party treatment are considerable, which confirms our previous findings on the persuasion effect.

In the literature, the persuasive effect of Fox news (DellaVigna and Kaplan 2007) was measured as $f = 11.6$; that of anti-Putin TV or NTV in Russia (Enikolopov et al. 2011) as $f = 7.7$; that of unsurprising and surprising Democratic endorsements (Chiang and Knight 2011) as $f = 2.0$ and $f = 6.5$, respectively; and that of a free subscription to the *Washington Post* (Gerber et al. 2009) as $f = 19.5$. Hence, relative to the previous studies of media effects, our persuasion rates tend to be similar or sometimes much larger, probably because of the intensity of our treatments.[37]

IV.   FINAL REMARKS

Our experimental design is inspired by Gerber et al. (2009) in assigning subjects to right-leaning or left-leaning newspapers, but our design is augmented through the additional dimension of traditional vs. newly emerging political parties by introducing new internet media that speak for the latter and through a marginal payment scheme that varies according to the extent of newspaper readership. These augmentations strengthen the intent-to-treat (ITT) and average treatment effects (ATE). This design enables us to identify a sophisticated mechanism by which biased media influence subjects' vote choices.

During a short period before an election, the treatment news articles with a particular slant work in different ways for different levels of information about candidates or parties. That is, the treatment articles are shown primarily to reinforce the existing preferences for well-known right-wing and left-wing parties (KMT and DPP) and their presidential candidates, while they can persuade subjects to vote for new parties (GSD) about which our treatments could be a main source of information. We also find that the main and reinforcement treatment effects are observed mostly

---

[37]The previous experimental studies about get-out-the-vote (GOTV) operations also sometimes found out large persuasive effects on voter turnout: e.g., door-to-door canvassing ($f = 15.6$, Gerber and Green 2000) and personal phone calls by youth vote ($f = 20.4$, Green and Gerber 2008). For comparison of persuasion rates across different studies, see DellaVigna and Gentzkow (2010).

among swing voters whose preference for presidential candidates is not yet firmly decided at the beginning of experiments.

One issue with media studies is that people tend to seek information that is consistent with their own beliefs or ideologies, and this so-called confirmation bias can confound our measurement of media effects. For example, if a subject who originally preferred the candidate *Tsai* is treated by KMT articles, she might doubt the objectivity of the treatment articles and try to look for articles of the opposite ideology, thus counterbalancing the treatment effects. In this scenario, our treatment has both direct and indirect effects on the subject's vote choices, where ATE is given by the sum of both effects, but the resulting sum will be underestimation of treatment effects in this case.

To distinguish between direct and indirect effects, we conducted mediation analysis as proposed by Imai, Keele, and Tingley (2010). We use the questions in the surveys about the changes in media consumption after the experiments. The results reflect that the KMT and DPP treatments increased the readership of the rightist United Daily and the leftist Liberty Times, respectively. Moreover, the estimated indirect effects through further consumption of media information on vote choices are negligible in magnitude (very close to zero) and not statistically significant at all. We interpret this as evidence that the observed treatment effects are mostly attributable to the direct effects of experimental treatments.[38]

While the results from mediation analysis support our assumption that subjects do not have much time to read from media sources other than our treatment articles, the media effects we have measured are based, at best, on a partial model in which variation in media (consumption) is exogenous. A general equilibrium model of media effects would allow individuals to choose from different media sources and would investigate how this endogenous selection of media affects vote choices and political behavior. Research along these lines includes studies by DellaVigna and Kaplan (2007), who used the availability of Fox News, and by Martin and Yurukoglu (2017), who used the differences in the location of Fox News in local cable channel lineups as an instrument. The method employed by De Benedictis-Kessner et al. (2019) also allowed subjects to choose to read their preferred news articles. In particular, De Benedictis-Kessner et al. (2019) administered both "forced exposure"

---

[38]The procedure of Imai et al. (2010) lets us estimate the direct and indirect effects through a single media source in the framework of binary comparison between, for example, the Control and KMT groups. We've conducted mediation analysis for Apple Daily, Liberty Times, United Daily, Storm media and combined rightist newspapers, and for each pair of treatment groups. The estimated indirect effects are mostly indistinguishable from zero while direct effects are relatively large in magnitude. The detailed estimation procedure and exemplary results are presented in the appendix.

and "free choice" conditions (among MSNBC, Entertainment or Fox) while focusing on a limited number of issues. Our experimental design is closer to the former condition according to their classification and implementation of the latter condition while covering a wide range of news issues in the context of large-scale elections is left for future research.

ACKNOWLEDGMENTS

REFERENCES

Berelson, B. R., P. F. Lazarsfeld, and W. N. McPhee. *Voting: A Study of Opinion Formation in a Presidential Campaign.* Chicago: Univ. of Chicago Press, 1954.

Chiang, C-F., and B. Knight. "Media Bias and Influence: Evidence from Newspaper Endorsements." *Review of Economic Studies*, 78(3), 2011, 795–820. `https://doi.org/10.1093/restud/rdq037`

De Benedictis-Kessner, J., M. A. Baum, A. J. Berinsky, and T. Yamamoto. "Persuading the Enemy: Estimating the Persuasive Effects of Partisan Media with the Preference-Incorporating Choice and Assignment Design." *American Political Science Review*, 113(4), 2019, 902–916. `https://doi.org/10.1017/S0003055419000418`

DellaVigna, S., and M. Gentzkow. "Persuasion: Empirical Evidence." *Annual Review of Economics*, 2, 2010, 643–669. `https://doi.org/10.1146/annurev.economics.102308.124309`

DellaVigna, S., and E. Kaplan. "The Fox News Effect: Media Bias and Voting." *Quarterly Journal of Economics*, 122(3), 2007, 1187–1234. `https://doi.org/10.1162/qjec.122.3.1187`

Enikolopov, R., M. Petrova, and E. Zhuravskaya. "Media and Political Persuasion: Evidence from Russia." *American Economic Review*, 101(7), 2011, 3253–3285. `https://doi.org/10.1257/aer.101.7.3253`

Ferraz, C., and F. Finan. "Exposing Corrupt Politicians: The Effects of Brazil's Publicly Released Audits on Electoral Outcomes." *Quarterly Journal of Economics*, 123(2), 2008, 703–745. `https://doi.org/10.1162/qjec.2008.123.2.703`

Fryer, Jr., R. G., P. Harms, and M. O. Jackson. "Updating Beliefs when Evidence is Open to Interpretation: Implications for Bias and Polarization." *Journal of the European Economic Association*, 17(5), 2019, 1470–1501. `https://doi.org/10.1093/jeea/jvy025`

Gentzkow, M. "Television and Voter Turnout." *Quarterly Journal of Economics*, 121(3), 2006, 931–972. `https://doi.org/10.1162/qjec.121.3.931`

Gentzkow, M., J. M. Shapiro, and M. Sinkinson. "The Effect of Newspaper Entry and Exit on Electoral Politics." *American Economic Review*, 101(7), 2011, 2980–3018. `https://doi.org/10.1257/aer.101.7.2980`

George, L. M., and J. Waldfogel. "The New York Times and the Market for Local Newspapers." *American Economic Review*, 96(1), 2006, 435–447. `https://doi.org/10.1257/000282806776157551`

Gerber, A. S., and D. P. Green. "The Effects of Canvassing, Telephone Calls, and Direct Mail on Voter Turnout: A Field Experiment." *American Political Science Review*, 94(3), 2000, 653–663. `https://doi.org/10.2307/2585837`

Gerber, A. S., D. Karlan, and D. Bergan. "Does the Media Matter? A Field Experiment Measuring the Effect of Newspapers on Voting Behavior and Political Opinions." *American Economic Journal: Applied Economics*, 1(2), 2009, 35–52. `https://doi.org/10.1257/app.1.2.35`

Green, D. P., and A. S. Gerber. *Get Out the Vote: How to Increase Voter Turnout.* Washington, DC: Brookings Inst. Press, 2008.

Imai, K., L. Keele, and D. Tingley. "A General Approach to Causal Mediation Analysis." *Psychological Methods*, 15(4), 2010, 309–334. `https://doi.org/10.1037/a0020761`

Klapper, J. T. *The Effects of Mass Communication.* Glencoe, IL: Free Press, 1960.

Lazarsfeld, P. F., B. R. Berelson, and H. Gaudet. *The People's Choice: How the Voter Makes Up His Mind in a Presidential Campaign.* New York: Columbia Univ. Press, 1944.

Martin, G. J., and A. Yurukoglu. "Bias in Cable News: Persuasion and Polarization." *American Economic Review*, 107(9), 2017, 2565-2599. `https://doi.org/10.1257/aer.20160812`

Ortoleva, P., and E. Snowberg. "Overconfidence in Political Behavior." *American Economic Review*, 105(2), 2015, 504–535. `https://doi.org/10.1257/aer.20130921`

Peisakhin, L., and A. Rozenas. "Electoral Effects of Biased Media: Russian Television in Ukraine." *American Journal of Political Science*, 62(3), 2018, 535–550. `https://doi.org/10.1111/ajps.12355`

Scheufele, D. A., and D. Tewksbury. "Framing, Agenda Setting, and Priming: The Evolution of Three Media Effects Models." *Journal of Communication*, 57(1), 2007, 9–20. `https://doi.org/10.1111/j.0021-9916.2007.00326.x`

Stromberg, D. "Media and Politics." *Annual Review of Economics*, 7, 2015, 173–205. `https://doi.org/10.1146/annurev-economics-080213-041101`

Sunstein, C. R., S. Bobadilla-Suarez, S.C. Lazzaro, and T. Sharot. "How People Update Beliefs about Climate Change: Good News and Bad News." *Cornell Law Review*, 102(6), 2017, 1431–1443. `https://scholarship.law.cornell.edu/clr/vol102/iss6/1`

Thaler, M. "The "Fake News" Effect: Experimentally Identifying Motivated Reasoning Using Trust in News." *Working Paper*, 2020.

Zizzo, D. J. "Experimenter Demand Effects in Economic Experiments." *Experimental Economics*, 13(1), 2010, 75–98. `https://doi.org/10.1007/s10683-009-9230-z`

Appendix A: Mediation Analysis

Media consumption can be a decisive factor in the formation of political preferences. We included in the surveys questions about media consumption behavior before and after the experiments. However, our treatments can simultaneously affect both subjects' political preferences and their media consumption behavior, and additional media consumption (other than treated articles) during the experiments can further influence their voting decisions. Usual econometric tools like instrument variables (IV) cannot be applied to our case due to the nature of our experimental designs, since there is no plausible IV to identify media consumption exogenously.

In order to identify the mediation effects of additional media consumption, triggered by our treatments, we apply the methods and statistical software kits (R package) developed by Imai et al. (2010). The mediation effect can be estimated by the product of coefficients in linear structural models.[39]

The key assumptions to identify mediation effects in the proposed methods follow from the principle of sequential ignorability (Imai et al. 2010), which can be formally written as

A1. $\{Y_i, M_i\} \perp T_i \mid X_i = x$;

A2. $Y_i \perp M_i \mid T_i = t, X_i = x$,

where $Pr(T_i = t | X_i = x) > 0$ and $Pr(M_i = m | T_i = t, X_i = x) > 0$ for $t = 0, 1$ (pairwise comparison between treatment groups), and all $x \in X_i$.

The first part of the assumptions asserts that outcome variables (Y) and mediation factors (M) should be conditionally independent of treatments (T), which is immediately satisfied in experimental studies. The second part further asserts that outcome (Y) should be conditionally independent of mediation factor (M) in each subgroup. Nevertheless, experimental designs themselves do not guarantee the second assumption. We need to conduct sensitivity analysis additionally. If the correlation between the errors of the two models are known, we can estimate the actual ACME (average causal mediation effect), or indirect effect in our frameworks, and ADE (average direct effect), which can be derived by the tools of sensitivity analysis proposed by Imai et al (2010). However, there is no way to acquire the actual correlation coefficients. Researchers must examine whether the estimated ACME is sensitive to the correlation according to the sensitivity analysis.

---

[39]Imai et al. (2010) further proposed a generalized version of mediation analysis applied to nonlinear specifications like probit or logit models.

We firstly show the treatment effects on subjects' media consumption. In the survey, we asked media sources from which subjects read the articles the most after the experiments. If a subject ranks a media source within his top three media, then we classify this subject as a consumer of this media (subjects can be a consumer of at most three media while they can also report less than three media sources). Table 14 shows how our treatments affect subjects' (further) consumption of news media, where the United Daily is our main source of KMT articles, the Liberty Times, the main source of DPP articles, and Storm media, the main source of Third treatment articles. We also used the China Times for KMT articles.

We can see from the table that the KMT treatment has significantly increased the consumption of the United Daily while the DPP treatment, that of the Liberty Times. The latter treatment has also increased the consumption of the China Times and the Storm Media, and the Third treatment, that of the Liberty Times. This shows that confirmation bias can work in any directions - either to reinforce or to counterbalance the slanted information included in the treated articles.

TABLE 14

Media Consumption after Treatments

VARIABLES	United Daily	Liberty Times	China Times	Apple Daily	Storm Media
KMT Treatment	0.204***	0.071	0.051	0.044	0.021
	(0.077)	(0.072)	(0.043)	(0.082)	(0.062)
DPP Treatment	0.046	0.201**	0.077*	0.041	0.119*
	(0.078)	(0.083)	(0.044)	(0.085)	(0.066)
Third Treatment	-0.008	0.146*	0.046	-0.109	0.045
	(0.076)	(0.086)	(0.045)	(0.078)	(0.066)
Constant	-0.007	-0.132	0.099	-0.185	-0.121
	(0.198)	(0.225)	(0.150)	(0.211)	(0.163)
Observations	190	190	190	190	190
R-squared	0.251	0.359	0.262	0.379	0.271

Note. (i) Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
(ii) All specifications include: gender, whether they are students/students from NTU, whether they are older than 25, whether the income is higher than 40,000NTD/month; whether they have voted before; and initial party preferences and media consumption behavior.

Since the proposed method of mediation analysis (as well as the R package) can only be applied to models with a single treatment and a single mediation factor, we conduct the analysis for each media source at a time, comparing between the control and a treatment group (or between a pair of treatment groups). Table 15 shows a sample of estimation results for indirect effects (ACME) on the support for

parties or candidates given as the column variables, mediated by the United Daily in comparison between the control and KMT groups. Note that the numbers in parentheses are p-values, and we can see that only the indirect effect on the support for DPP and GSD is marginally significant, but that the indirect effects for other parties or candidates are negligible in size and not significant at all. The results in the third column can be interpreted as follows: the KMT treatment has, relative to the control group, increased the support for DPP by 4.8% through the channel of direct effect while decreased the support for the same party by 3% through the channel of indirect effect mediated by the United Daily. ATE is roughly the sum of these two effects.

TABLE 15

Estimates of Direct and Indirect Effects (United Daily: Control vs. KMT)

	KMT	DPP	GSD	NPP	*Chu*	*Tsai*	*Soong*
ACME	0.002	-0.03*	0.032*	-0.004	-0.005	-0.003	0.005
	(0.94)	(0.08)	(0.10)	(0.82)	(0.74)	(0.88)	(0.82)
ADE	0.096	0.048	0.09	-0.121	0.087	-0.041	0.000
	(0.18)	(0.50)	(0.24)	(0.16)	(0.34)	(0.62)	(0.96)
ATE	0.097	0.019	0.122*	-0.125	0.082	-0.044	0.005
	(0.14)	(0.78)	(0.10)	(0.14)	(0.38)	(0.60)	(0.92)

Note. p-values in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

We obtain similar results for indirect effects mediated by various media sources in all possible comparison groups. In all cases, mediation effects are observed to be small and not statistically significant (complete results available). This is true for the model of same/different treatments compared with initial preferences with the mediation variable now being "whether the subjects consume media sources of similar ideology". We thus conclude that the observed treatment effects are largely attributable to direct treatment effects. As mentioned above, sensitivity analysis is required to determine the robustness of our results. Most of our insignificant results are robust under moderate levels of correlation ($|\rho| < 0.3$). The only significant case (ACME on DPP in the above table) is marginally sensitive to the correlation coefficient because the size of ACME is small.