

# Dynamic Persuasion: Decay and Accumulation of Partisan Media Persuasion

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## Abstract

Both academic researchers and political pundits have warned about the cumulative effects of partisan media over time. This worry hinges upon the idea that repeated exposure to extreme media may have a much greater influence on political attitudes than a single viewing. On the other hand, the persuasive effect of partisan media might be temporary and decay quickly after a single exposure. Yet almost all experiments on partisan media's effects on public opinion are single-exposure studies. These designs limit the relevance of estimates that such studies produce for politics and policy. We implement a novel set of multiwave experiments that allow us to examine concerns about media effects over time, and present estimates from three studies which all show that the persuasive effect of exposure to just a short article or video clip can persist for up to a week. In contrast, our results suggest that an experiment adequately powered to detect the accumulative effect from multiple doses of partisan media — let alone one powered to detect accumulative effects among subgroups of the population — would require an unrealistic number of respondents, suggesting that such effects are difficult to test in an experimental setting with limited resources.

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# Introduction

Statements by pundits, politicians, and citizens alike lament the rise of political polarization and the role that partisan news media may have played in this process over time. In particular, this argument articulates a worry that silos of repeated exposure to one-sided media may cause political attitude extremism via accumulated and persistent persuasion (Pariser, 2012; Sunstein, 2001; Tufekci, 2018). However, observational data rarely allows researchers to examine either the accumulation or persistence of partisan media’s effects over time.

In the face of this challenge, political scientists have turned to experimental methods. These studies generally take the form of “single shot” experiments, where the researcher randomly assigns the respondents to read a short article or watch a short news clip and then immediately measures the respondent’s attitude on various political issues (e.g. Arceneaux, Johnson and Murphy, 2012; Leeper and Slothuus, 2014; de Benedictis-Kessner et al., 2019). Such studies allow researchers to credibly estimate the short term effect of a small dose of partisan media on their respondents’ political attitudes. However, these single shot designs represent a stylized view of how individuals are repeatedly exposed to their favorite sources of news over weeks and months.

In particular, we focus on two ways in which such studies deviate from real world behavior. First, they focus on the instantaneous change in respondents’ attitudes. However, the persuasive effect of partisan media may quickly decay, limiting its ultimate effect on public opinion and political behavior. Second, they typically focus on the consumption of just a single story at a single moment in time. Yet in reality, many readers or viewers will repeatedly consume their favorite publications and broadcasts, potentially amplifying their persuasive effects through accumulation. Such effects may also persist over time. Single-exposure studies with immediate measurement of attitudinal change have little ability to mirror these real-world processes and therefore assess their effects (Slater, 2004).

In this paper, we address these shortcomings by conducting a series of large-scale multiwave experiments that test for both the accumulation and subsequent decay of media

persuasion. Specifically, we report the results of three survey experiments. Experiment 1 focused on policy attitudes about the legalization of marijuana and consisted of three waves. In this experiment, we exposed respondents to a short news article in one or both of the first two waves and measured their policy attitudes in all three waves, allowing us to study the accumulative effects of receiving multiple treatments as well as the longevity of these effects. Based on the results of Experiment 1, we determined that an adequately powered experiment isolating such accumulative effects would be virtually infeasible, but discovered evidence suggesting the persistence of persuasive effects between waves. Thus, we conducted Experiments 2 and 3 to replicate our tests of the persistence of these persuasive effects. Both of these follow-up studies consisted of two waves and focused on the break-up of large technology companies. In both experiments, we only treated respondents once in the first wave but measured their policy attitudes in both waves, allowing us to assess the persistence of the persuasive effects of the initial treatment over the two waves.

The results of these three studies lead to two salient conclusions. First, we demonstrate that partisan media’s persuasive effects are persistent. All three of our studies show that the effects of treatment persist for over a week, suggesting that even brief exposure to a short cable news clip or article can lead to a durable change in attitudes. We also explore how the persistence of these persuasive effects varies with a respondent’s stated media preference. While the precision of these subgroup estimates are limited by the size of the media preference groups, they suggest more persistent effects among respondents who indicated that they prefer partisan media over entertainment.

Second, based on the results of Experiment 1, as well as the magnitude of immediate persuasive effects revealed in Experiments 2 and 3, we show that it would be very difficult to conduct an adequately powered experiment to examine how persuasive effects vary with the treatment received in the previous wave – that is, whether they accumulate over time. Consequently, we believe that our results approach the limit of what can be learned about the accumulative effects of partisan media from design-based analyses such as multiwave

experiments. Exposure to partisan media leads to persistent persuasive effects, but studying how these effects might accumulate is unlikely to be achievable with realistic sample sizes without the aid of strong modeling assumptions.

## Experimental Designs to Assess Dynamic Persuasion

A number of studies have documented that even fleeting exposure to partisan media can change the opinions of its viewers and readers. These studies are typically single shot experiments, in which respondents read a short article or watch a short video and then complete a survey (e.g. Arceneaux, Johnson and Murphy, 2012; Leeper and Slothuus, 2014; de Benedictis-Kessner et al., 2019). A smaller number of researchers have introduced a second survey wave to measure the persistence of these persuasive effects. However, the time until followup has been relatively short. For example, Levendusky (2013b) conducted a second wave 48 hours after the first, leaving the longer term durability of these persuasive effects unknown.

Single shot experiments are unrealistic in two principal ways. First, typical consumers of partisan media repeatedly watch or read their favorite shows and publications, leading to persuasive effects that are potentially much larger than that following a single dose. Indeed, these multiple exposures could lead to real-world effects on public opinion far in excess of what a single shot experiment can reveal. Second, although some respondents consume partisan news regularly, often the political outcomes we care about, such as participation in elections, protest, or a host of other behaviors, may occur long after media exposure. If we are interested in the influence of partisan media on real-world outcomes, our research should thus examine the persistence of media’s persuasive effects. Yet much of the research on partisan media sidesteps questions about both the potential effects of multiple exposures to media and the durability of these effects. We refer to these questions as *accumulation* and *persistence* effects, which we discuss in the remainder of this section.



## Accumulation of Partisan Media’s Effects

Most people who watch or read partisan media do so repeatedly. Over time, the consumption of these partisan media can lead to both attitudinal change and shifts in electoral choices, as identified with aggregate observational data (Ash et al., 2021; Hopkins and Ladd, 2014; Martin and Yurukoglu, 2017). Yet these real-world aggregate findings are difficult to square with the findings of studies using common experimental methods for studying partisan media’s effects, which usually rely on a single exposure to partisan news. A few studies, however, have used experimental designs incorporating multiple exposures to partisan news and assessed whether repeating the arguments contained in partisan news produces an additive or cumulative effect. This research has pointed to limited accumulation of persuasive effects after repeated exposure to media, depending on the content, circumstances, and individuals receiving information.

In one example of such research, Levendusky (2013a) shows survey respondents either like-minded partisan news editorials or apolitical articles in a two-wave experiment. He demonstrates that multiple exposures to like-minded partisan media can polarize people’s attitudes more than a single exposure, but that this effect is smaller than the initial effects of (novel) political news. Thus we might expect that persuasive effects compound after multiple exposures relative to a single exposure. That said, additional research testing the effects of repeated exposure to political media indicates limits to this accumulation, and suggests that repeated exposure may have no effect beyond that of a single exposure (Lecheler and de Vreese, 2013). This latter finding is consistent with communication theory predicting that repeated framing of information may be redundant (Baden and Lecheler, 2012).

Limited accumulation of persuasive effects may stem from qualities of both the individual and the information being presented. For instance, “pretreatment” effects of the prior exposure to partisan media may limit the degree of attitude change that can occur subsequently (Druckman and Leeper, 2012). Similarly, if individuals are exposed to cross-cutting arguments that counter each other with competing messages, repetitive exposure

may not have an additional impact on attitudes or beliefs (Chong and Druckman, 2010). Thus individuals' prior exposure may moderate the cumulative nature of persuasive effects (de Benedictis-Kessner et al., 2019; Huber and Arceneaux, 2007; Zaller, 1992). This would lead us to expect large initial effects and large effects among those with limited previous exposure, but little additional impact of repeated treatment by partisan media. The message itself may also influence the accumulation of attitude change. Negatively framed information may be more persuasive when repeated, while positively framed information may not be as effective (Lecheler et al., 2015). Similarly, if the topic of information is relevant to individuals (Cacioppo and Petty, 1979; Liu et al., 2019) or the argument contained in that information is stronger (Cacioppo and Petty, 1989), multiple exposures to a certain framing of that information may be more persuasive than a single exposure. Consequently, examining how the persuasive effect of partisan media accumulates over extended periods of time is important for understanding the real world impact of partisan media on public opinion.

## **Persistence and Decay**

Partisan media's persuasive effects over time may accumulate, but they may also decay. If persuasive effects are short-lived they may not be as critical a problem for democratic deliberation as if they are persistent (Gaines, Kuklinski and Quirk, 2007). Identifying the long-term persistence of persuasive effects is a crucial step toward understanding the real-world role of the media.

Previous work on informational framing in news articles indicates that experimental estimates of persuasion may be quite persistent.<sup>1</sup> Partisan media's polarizing impact, in particular, may endure for at least two days (Levendusky, 2013*a*, p. 85-86). Some persuasion may only decay in size by approximately half over ten days and persist at that level for up

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<sup>1</sup>One related theory in research on media effects that we do not discuss at length here argues that the persuasive impact of political communication will not manifest immediately, but will have a delayed "sleeper effect" (e.g. Hovland, Lumsdaine and Sheffield, 1949; Hovland and Weiss, 1951). More recent work, however, has failed to find evidence of a sleeper effect, except in limited circumstances (Capon and Hulbert, 1973; Coppock, 2017; Gillig and Greenwald, 1974; Jensen et al., 2011).

to a month (Coppock et al., 2018). This persistence may result from the content of the information presented to people. Persuasion may be especially persistent if it provides new information to people rather than simply framing existing information (Coppock, 2017), or if it negatively frames information (Lecheler and de Vreese, 2011).

Additional research on this question suggests that persuasive effects may decay, but only in certain segments of the population — such as those who are high in “need for cognition” (Chong and Druckman, 2010), or moderately politically knowledgeable (Baden and Lecheler, 2012). Such individual-level characteristics may moderate the persistence of partisan media’s influence.

On the other hand, research on campaigns and highly polarized policy issues suggests a different conclusion regarding the persistence of persuasion. Hill et al. (2013) show that the effects of presidential campaign advertisements may decay by half after 4 days, but some small effects may persist even 6 weeks later. Thus, in highly salient campaigns, political persuasion from advertising may be minimally persistent. Hill et al. (2013) show that the persistence of political advertising’s effect is even smaller in Senate, House, and gubernatorial elections. Similarly, Dowling, Henderson and Miller (2019) show that while informational treatments about the Affordable Care Act can durably affect people’s levels of knowledge about policy-related facts, the effects on policy attitudes fade within a week. Likewise, the effects of new information on evaluations of government may also dissipate within a week (Kalmoe et al., 2019). Thus in both low-salience elections and on policy issues, attitudinal persuasion may be short-lived.

Identifying the conditions under which the persuasive effects of partisan media decay and accumulate is essential for understanding the real world effect of partisan media on policy and public opinion. To address these questions, we constructed several experiments to test whether the persuasive effects of fleeting exposure to a short partisan media article or video clip can accumulate, and whether their effects persist over days and weeks.

# Experimental Design

Our three experiments employ multiple media formats (text and video) to examine the temporal dynamics of partisan media exposure’s effects on public opinion on two distinct policy issues. The first study (Experiment 1) used a three-wave design involving text treatments, while the second and third experiments focused on the persistence and decay of persuasive effects in two-wave experiments with both text (Experiment 2) and video (Experiment 3) treatments.

## Experiment 1

We embedded Experiment 1 within a three-wave panel survey. In the first two waves, respondents provided their stated media preference before reading an article supportive of marijuana legalization (MSNBC), opposed to marijuana legalization (Fox News), or about grocery shopping (the entertainment, or placebo condition). In both waves, we randomly assigned half the respondents to a “free choice” condition, which tasked respondents with reading an article of their choice, and half to a “forced choice” condition, which randomly assigned respondents to read one of the three articles.<sup>2</sup> Our outcome measure for this experiment was the first principal component of a wide ranging series of questions on marijuana policy. We provide additional details on the experimental design, including the full text of these questions, in Section C of the supplementary information (SI). The third wave included the same outcome battery, but did not include a treatment.

We administered this experiment via an online survey to a national sample of respondents recruited through Dynata.<sup>3</sup> Our sample consisted of 7,393 survey respondents in the first wave, 4,926 in the second wave, and 4,526 in the third wave. We invited respondents to

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<sup>2</sup>Note this distinction between the free and forced choice groups represents an adaptation of a PICA design (de Benedictis-Kessner et al., 2019; Knox et al., 2019) to the multiwave setting.

<sup>3</sup>Dynata recruits participants through various online communities, social networks, and website ads. When deploying a particular survey, Dynata randomly selects participants for survey invitations. We asked Dynata to recruit a target population that matched the (18 and over) census population on education, gender, age, geography, and income. The result is a diverse national sample, albeit not a probability sample.

the first two waves to participate in the next wave one week after they had completed the previous survey wave. This yielded a final retention rate in the third wave of 61.2%. Section B provides the demographic composition of our panel.

## Experiment 2 and 3

We designed Experiments 2 and 3 to replicate the findings of persistent persuasive effects seen in Experiment 1 using a second policy issue: the breakup of big technology companies.<sup>4</sup> Both experiments included two waves. In Experiment 2, we randomly assigned respondents into one of three treatment conditions: a pro-breakup condition where respondents read two articles with MSNBC formatting supporting the breakup of tech companies, an anti-breakup condition where respondents read two articles with Fox News formatting opposing the breakup of tech companies, and an entertainment condition where respondents read two articles about grocery shopping, presented with the Food Network logo. In both the MSNBC and Fox conditions, one article always focused on monopolization and market power while the other focused on the spread of misinformation online.

Experiment 3 employed a video treatment and randomly assigned respondents to watch either a pro-breakup video clip from MSNBC, an anti-breakup clip from Fox News, or a non-political clip from the Food Network about how to make a fried chicken sandwich. Both experiments used the same outcome questions, and our pre-registered analyses focused on two outcome measures: the number of big technology companies respondents said they would like to see broken up and the first principal component of a battery of questions about those companies and tech policy more generally.<sup>5</sup> In both experiments, Wave 2 included no treatment, and instead just repeated the outcome measures, allowing us to assess the persistence of the treatment effects between waves.

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<sup>4</sup>We pre-registered our design and analysis for Experiment 2 ([https://osf.io/gy9q5/?view\\_only=3462b04bb6934a4a8744a3fe5b8259a3](https://osf.io/gy9q5/?view_only=3462b04bb6934a4a8744a3fe5b8259a3)) and Experiment 3 ([https://osf.io/hefm2/?view\\_only=cf19e3618c9a4f9e8150c699f43e9b4f](https://osf.io/hefm2/?view_only=cf19e3618c9a4f9e8150c699f43e9b4f)) with the Open Science Foundation.

<sup>5</sup>See Section C of the SI for more details on these experiments, including the complete text of the survey questions used.

We administered these experiments via an online survey to a national sample of respondents recruited through Dynata. Experiment 2 included 3,816 respondents in its first wave, of which 1,487 (38%) were retained in Wave 2. Experiment 3 included 3,367 in the first wave, and retained 1,830 (54%) in the second wave.

## Results

### Persistence

#### Experiment 1

Figure 1 presents results regarding the magnitude and persistence of the persuasive effects of partisan media over the course of the three survey waves in Experiment 1. The left hand panel shows the results using a simple additive index as the outcome measure while the right hand panel shows the results using the first principal component of those questions.<sup>6</sup> In both cases, the vertical axis plots the difference in the outcome between those respondents receiving a partisan news treatment and those respondents receiving the entertainment media treatment. Positive effects indicate that the treatment resulted in more conservative attitudes while negative effects suggest that treatment led to more liberal ones. The estimates presented here use respondents that were randomly assigned a treatment in wave 1, but were in the free-choice group in the second wave.

Both outcome measures reveal similar evidence of persuasion. The estimated average treatment effect of Fox News rather than entertainment (red points and line) is 0.032 for the attitudinal index, which we normalized to range from zero to one (with a 95% confidence interval of [0.017, 0.048]). The estimated effect is 0.129 standard deviations [0.06, 0.199] for the first principal component outcome. This effect is also statistically significant for both outcomes in the first survey wave, indicating that respondents who consumed conservative media rather than entertainment media reported more conservative opinions. Meanwhile,

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<sup>6</sup>We present results for the individual questions in SI D.1.

the treatment effect of MSNBC rather than entertainment (blue points and line) is  $-0.013$   $[-0.029, 0.002]$  for the attitudinal index, which we also normalized to range from zero to one, and  $-0.059$  standard deviations  $[-0.13, 0.012]$  for the first principal component. Although in the expected direction, these effects are smaller than we observe for the Fox treatment and statistically insignificant.

These effects also appeared in the individual questions that formed these indexes. For example, 63% of respondents at least somewhat agreed with the statement that “Marijuana should be legal for recreational use” after receiving the MSNBC treatment while only 52% did after receiving the Fox News treatment. Similarly, respondents were 6.7 percentage points more likely to indicate that legalizing marijuana would make the economy at least somewhat better after receiving the MSNBC treatment than after receiving the Fox News treatment.

For both outcome measures, the point estimate for the persuasive effect of being treated with Fox News rather than entertainment is essentially unchanged in the second wave, but is near zero and statistically insignificant for the MSNBC treatment. The persuasive effect of treatment with Fox News rather than entertainment is even stronger ( $0.049$   $[0.031, 0.066]$  for the attitudinal index, which ranged from zero to one, and  $0.211$   $[0.135, 0.286]$  for the unit variance first principal component outcome) in Wave 3 and is again statistically significant for both outcome measures. Conversely, the effect of treatment with MSNBC rather than entertainment remains null. Overall, these results suggest that partisan news can have a persistent persuasive effect, even when treatment involves reading just a short news article.

Figure 2 presents these results divided by respondents’ stated media preferences. The panels on the left hand side present the results for the additive index outcome, while the right hand panels present the results for the first principal component outcome. Both outcomes suggest that the Fox News treatment is most persuasive among respondents who prefer Fox News (bottom panels). Among this subgroup, there is a significant persuasive effect that persists for the second and third waves for both outcomes, while the MSNBC treatment has

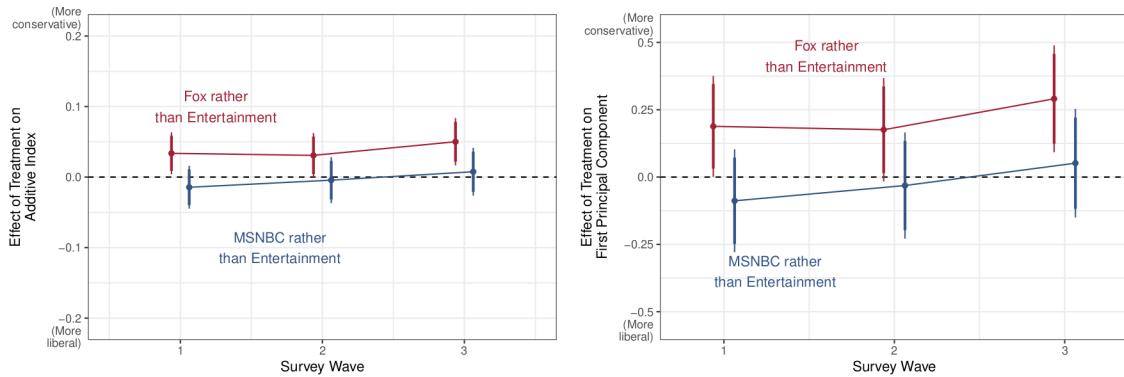


Figure 1: Experiment 1 Results in Full Sample. Points represent the effect of being treated with partisan media instead of entertainment on the outcome measured in the wave identified on the x-axis, with 95% (thin lines) and 90% (thick lines) confidence intervals. Red shading identifies the effect of being treated with Fox News while blue shading identifies the effect of being treated with MSNBC.

no effect. We observe a similarly persistent effect from reading MSNBC among respondents who stated a preference for entertainment (middle panels). Among this subgroup, there is a significant persuasive effect from reading the MSNBC articles rather than the entertainment articles in the first wave on both outcomes. The size of these treatment effects is similar in Waves 2 and 3, though it is not statistically significant. The treatment effects of both the MSNBC and the Fox News articles, compared to the entertainment articles, are near zero in every survey wave among the subgroup of respondents who stated a preference for MSNBC (top panels).

One complicating factor in interpreting these results is the role of the free-choice condition in wave 2. Specifically, our design allows respondents to consume a follow-up dose of partisan media of their choice, to some extent simulating the real world process by which respondents will self-select into additional doses of partisan media. Although more realistic, this design might lead us to overstate the persistence of the effects of partisan media relative to a design with no treatment in the second wave. Unlike Experiment 1, Experiments 2 and 3 did not include a second treatment in Wave 2, and so allow us to more directly identify the persistence of the persuasive effect of a single dose of partisan media.



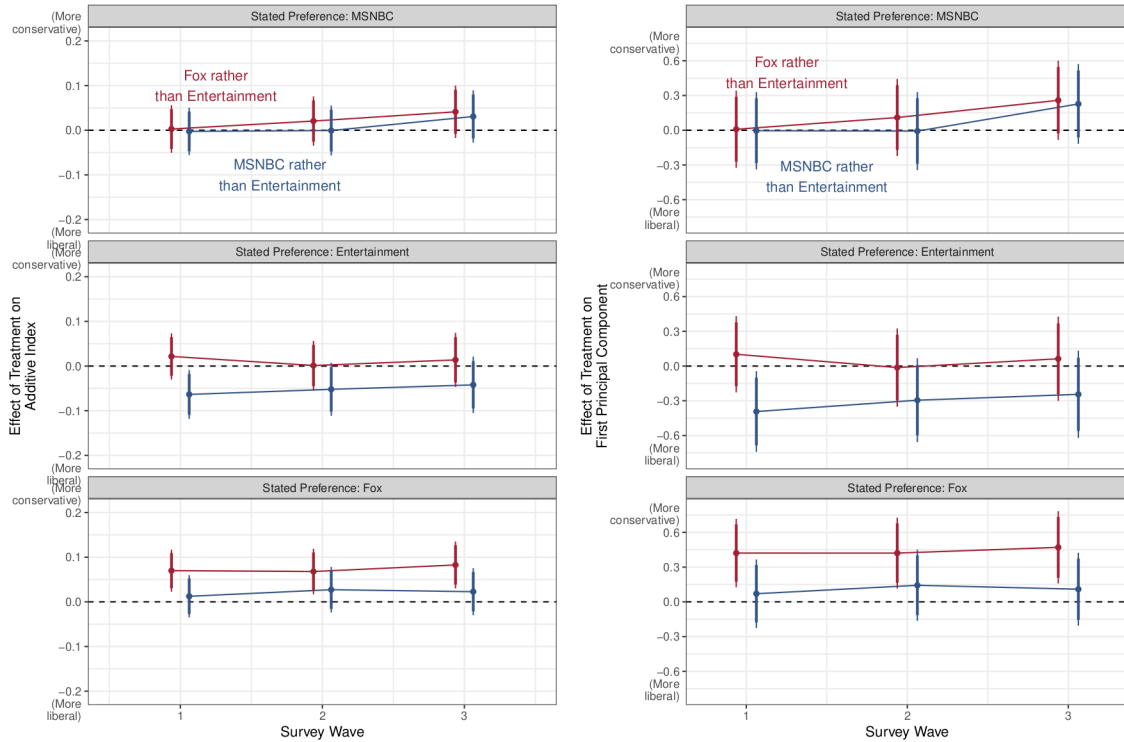


Figure 2: Persuasive Effects by Media Preference Subgroup. Points represent the effect of being treated with partisan media instead of entertainment on the outcome measured in the wave identified on the x-axis in a given subgroup, with 95% (thin lines) and 90% (thick lines) confidence intervals. Red shading identifies the effect of being treated with Fox News while blue shading identifies the effect of being treated with MSNBC. Estimates are based only on respondents that were assigned to the forced-choice group in wave 1 and the free-choice group in wave 2.

## Experiments 2 and 3

We next present the estimates for the persuasive effect of partisan media in the full sample for both our “number of companies broken up” outcome (Figure 3) and first principal component outcome (Figure 4) in Experiments 2 and 3.<sup>7</sup> Both Experiment 2 (the text treatment, presented on the left side of both figures) and Experiment 3 (the video treatment, on the right side of both figures), confirm the same wave persuasive effect of partisan media. The effect of being treated with Fox rather than entertainment is statistically significant in both experiments for both outcomes in the first wave, while the effect of treatment with MSNBC rather than entertainment is significant for both outcomes in Experiment 3, as is the “number of companies broken up” outcome in Experiment 2. Specifically, we see that respondents who received the Fox treatment wanted to break up 0.206 [0.136, 0.276] fewer companies than respondents who received the entertainment treatment. Fifty-nine percent of respondents indicated they would break up at least one big tech company after receiving the entertainment treatment, but only 53% did after reading the Fox article. We observe a similar effect of 0.208 standard deviations [0.163, 0.253] for the first principal component outcome for the Fox treatment in Experiment 2. We also observe an effect of 0.171 [0.113, 0.228] for the number of companies broken up outcome and -0.03 standard deviations [-0.075, 0.016] for first principal component outcome for the MSNBC treatment in Experiment 2.

Most important for our purposes, we also observe a persuasive effect that persists into the second wave, which we administered roughly one week after the first wave in both experiments. In Experiment 2, we find a significant effect from treatment with MSNBC on the “number of companies broken up” outcome of 0.241 [0.141, 0.34] and a suggestive one on the first principal component outcome of -0.063 standard deviations [-0.109, -0.018]. The effect of treatment with Fox seems to attenuate more strongly in Experiment 2, with respondents only choosing to break up 0.008 [-0.09, 0.107] fewer companies after receiving the Fox treatment. We see a comparably small effect of 0.023 standard deviations [-0.039, 0.085]

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<sup>7</sup>We present results for the individual questions in Sections D.2 and D.2.

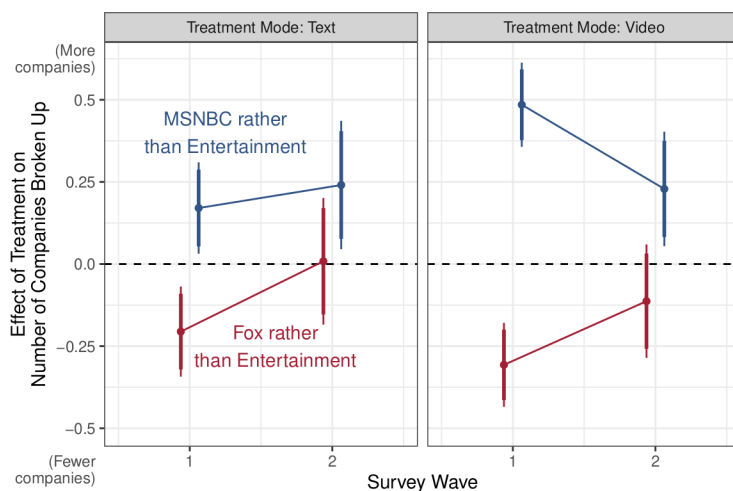


Figure 3: Effect of Treatment on Number of Companies Broken Up in Experiments 2 and 3. Points represent the effect of being treated with partisan media instead of entertainment on the outcome measured in the wave identified on the x-axis, with 95% (thin lines) and 90% (thick lines) confidence intervals. Red shading identifies the effect of being treated with Fox News while blue shading identifies the effect of being treated with MSNBC. The left panel shows effects in Experiment 2 (text stimuli) and the right panel shows effects in Experiment 3 (video stimuli).

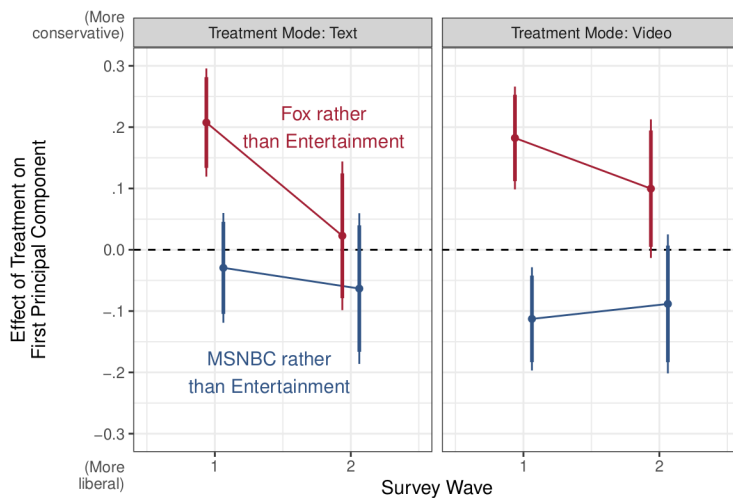


Figure 4: Effect of Treatment on First Principal Component in Experiments 2 and 3. Points represent the effect of being treated with partisan media instead of entertainment on the outcome measured in the wave identified on the x-axis, with 95% (thin lines) and 90% (thick lines) confidence intervals. Red shading identifies the effect of being treated with Fox News while blue shading identifies the effect of being treated with MSNBC. The left panel shows effects in Experiment 2 (text stimuli) and the right panel shows effects in Experiment 3 (video stimuli).

for the first principal component outcome. We also see that respondents were 5 percentage points more likely to support breaking up at least one of the big tech companies in wave 2 after receiving the entertainment rather than the MSNBC treatment in wave 1. In contrast, the effect of being treated with Fox is near zero in the second wave.

The effect of the video treatment used in Experiment 3 appears even larger and is also persistent.<sup>8</sup> Specifically, we saw respondents treated with Fox support breaking up 0.307 [0.242, 0.372] fewer companies than after receiving entertainment, while respondents treated with MSNBC favored breaking up 0.485 [0.42, 0.55] more companies than after receiving entertainment. Similarly, 64%, 77%, and 76% of respondents favored breaking up at least one big tech company after receiving the Fox, entertainment, and MSNBC treatments, respectively. These effects also persisted into the second wave, where respondents who received the Fox treatment in wave 1 reported that they favored breaking up 0.113 [0.025, 0.201] fewer companies in Wave 2 than after receiving entertainment. Similarly, respondents treated with MSNBC in wave 1 favored breaking up 0.229 [0.14, 0.318] more big tech companies in wave 2 than respondents treated with entertainment in wave 1. Overall, 75%, 77%, and 78% of respondents supported breaking up at least one tech company in Wave 2 after having been treated with the Fox, entertainment, and MSNBC treatments in wave 1, respectively. This compares with 77% of respondents wanting to break up at least one big tech company in the full sample, suggesting that treatment effects diminished in the second wave, but did not vanish completely.

A similar pattern emerges for the first principal component outcome, where we observed an effect of -0.113 standard deviations [-0.07, -0.022] for the MSNBC treatment and 0.182 standard deviations [0.14, 0.225] for the Fox treatment in wave 1. This effect attenuated to -0.088 standard deviations [-0.146, -0.03] for the MSNBC treatment and 0.1 standard deviations [0.042, 0.157] for the Fox treatment in Wave 2. In other words, the effects from

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<sup>8</sup>With the exception of the effect of the Fox treatment on the Wave 1 first principal component outcome, the coefficient associated with the video treatment in Experiment 3 is larger than that associated with the text treatment used in Experiment 2 as well.

Experiment 3 appeared to be similarly persistent to those we observed in Experiment 2. Taken together, the results from these experiments suggest that both text and video treatments by partisan media can be persuasive, and their effects on policy opinions can last for at least a week.

## **Accumulation**

### **Experiment 1**

Beyond identifying a persistent persuasive effect of partisan media, we also designed Experiment 1 to allow us to test for the accumulation of partisan media’s persuasive effects after multiple exposures. Such accumulative effects require us to examine how persuasive effects vary with repeated exposures to partisan media. Specifically, we focus on whether the effect of receiving two doses of partisan media treatment (once each in waves 1 and 2) is larger or smaller than the effect of being exposed to partisan media only in the second wave. A larger effect from repeated doses would suggest that the real-world effects of partisan media on the beliefs of its regular viewers are larger than a single shot experiment could reveal.

Figure 5 visualizes the evidence for accumulative effects in Experiment 1. Specifically, the vertical axis represents the estimated effect of treatment with different doses of partisan media (rather than exposure to entertainment in both waves) on respondents’ attitudes as reported in the second wave. The horizontal axis breaks down the results based on the dosage of partisan media treatment – either once (in wave 2, after being exposed to the entertainment treatment in wave 1) or twice (in wave 1 as well as wave 2) – with a panel for each partisan media outlet. While the results are noisy, they offer little evidence of accumulative effects of partisan media. For the subgroup of respondents who received entertainment in the first wave, the treatment effects of consuming Fox or MSNBC in the second wave (relative to entertainment in the second wave) are in the expected direction. Yet neither effect is statistically significant – and neither effect is statistically significantly larger for those people who received that same partisan media treatment in wave 1 as well. In

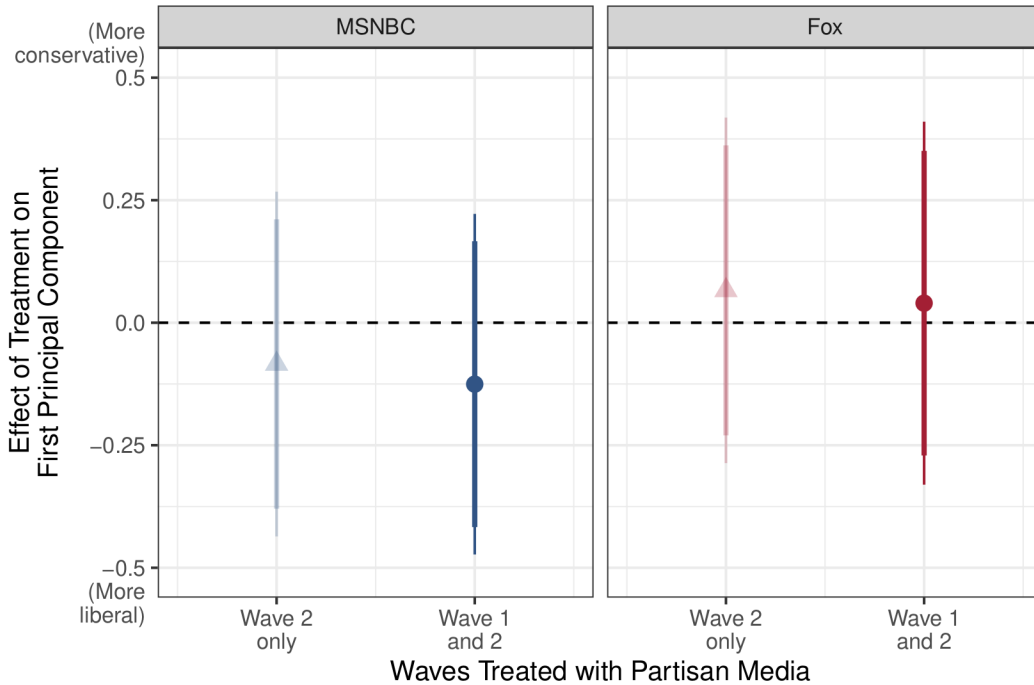


Figure 5: Accumulation Effects in Experiment 1. Points represent the effect on respondents’ attitudes from one exposure to partisan media in wave 2 after exposure to entertainment in wave 1 (partially transparent triangles) or two exposures to partisan media in both wave 1 and 2 (non-transparent circles), both relative to exposure to entertainment twice, with 95% (thin lines) and 90% (thick lines) confidence intervals.

other words, we see no reliable evidence that two doses of partisan media treatment is more powerful than one. However, these estimates are too noisy to allow us to conclusively say that the treatment effect is small. This imprecision results from the large number of treatment combinations we needed to assess the accumulative effects of partisan media. Consequently, we present the results of power analysis aimed at estimating the number of respondents needed for an adequately powered experiment in the next section.

### The Infeasibility of an Adequately Powered Experiment on Accumulative Effects

Our estimates regarding the presence of accumulation effects were very imprecise, leading us to consider the feasibility of conducting an adequately powered follow up experiment on this topic. In particular, we conducted this analysis assuming an experimental design where we randomly assigned respondents to one of three treatment groups in each of two waves:

MSNBC, Fox, or Entertainment. We focused on identifying the difference in treatment effects between respondents who were exposed to partisan media in both the first and second wave versus those who were exposed in only the second wave.

Although Experiment 1 provides some evidence for the magnitude of this difference, it is extremely imprecise. Indeed, the 95% confidence interval for the effect of two doses of the Fox treatment on the second wave outcome ranges from -2.53 to 3.51 times the effect of a single dose of the Fox treatment on the first wave outcome. Similarly, the 95% confidence interval for the effect of two doses of the MSNBC treatment on the second wave outcome ranges from -3.41 to 4.36 times the effect of a single dose of the MSNBC treatment on the first wave outcome.

This imprecision is fundamentally driven by the number of different treatment combinations included in our experiment. Although the forced-choice arm in Experiment 1 included 1,194 respondents in total, there were 9 distinct treatment combinations that respondents could have received across the two waves. Consequently, no pair of wave 1 and wave 2 treatments received more than 148 respondents. This rendered any attempt to estimate the difference in outcomes between respondents in any two pairs of treatment combinations under-powered.

So, instead of relying on the estimates for the effect of a second dose from Experiment 1, we instead focus on what we consider the plausible range of effects of two doses relative to one. Specifically, we calculated the Minimum Sample Size (MSS) required for us to conduct an experiment with a power level of 0.8 aimed at distinguishing the effect of two doses of the same partisan media from the effect of just a single dose under different assumptions about the effect of two doses as a percent of one dose. Our estimates assume that the effect of a single dose of partisan media is fixed at the level we observed in the first wave of our experiment. Larger treatment effects will be associated with more optimistic power calculations.<sup>9</sup> While it is theoretically possible that a carefully constructed experiment could

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<sup>9</sup>For example, if the true effect of a single dose were twice what we observed in the first wave, our original experiment would have been adequately powered to detect the difference in the effect of one and two

produce treatment effects that are significantly larger than this, we consider it unlikely. In Wave 1, we observed standardized treatment effects of 0.129 and -0.059 for the Fox and MSNBC treatments, respectively, which are similar to the wave 1 effects we observed in Experiments 2 (0.208 for Fox and -0.03 for MSNBC) and 3 (0.182 for Fox and -0.113 for MSNBC), suggesting much larger treatment effects may be difficult to achieve.

Figure 6 visualizes the results of this power analysis. The x-axis represents the assumed effect of two doses of partisan media as a percent of the effect of a single dose. The y-axis visualizes the MSS needed for an adequately powered experiment under the assumed decline in persuasive effects. These results assume that the effect of a single dose of partisan media is the same as that observed on the additive index in the first wave of Experiment 1. They also assume an  $\alpha$  of .05 and that the variance of the outcome measure is fixed at that observed for the additive index in the first wave. The left panel highlights the MSS needed to distinguish the effect of a second dose of the Fox treatment from a first dose of the Fox treatment, while the right panel does the same for the MSNBC treatment.

Our original experiment randomly assigned respondents to each of the three treatment conditions in each wave, so that all respondents ultimately received one of 9 different treatment combinations. However, the analysis of accumulation effects really only makes use of 5 treatment groups (i.e., entertainment-entertainment, entertainment-Fox, Fox-Fox, entertainment-MSNBC, and MSNBC-MSNBC), so a more streamlined experiment might improve the power by randomizing respondents only among these combinations. Indeed, if we were willing to focus on only one type of partisan media and eliminate the Fox or MSNBC arms, we could further improve the power of the experiment by using only 3 treatment groups (e.g. Fox-Fox, entertainment-Fox, and entertainment-entertainment). The coloring of points and lines in Figure 6 identifies our estimates of the minimum sample size needed for an adequately powered experiment under each of these assumptions about the number of treatment groups used, with the red points and lines indicating the most pared-down version

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treatments under the assumption that the effect of two treatments is double the effect of a single one.



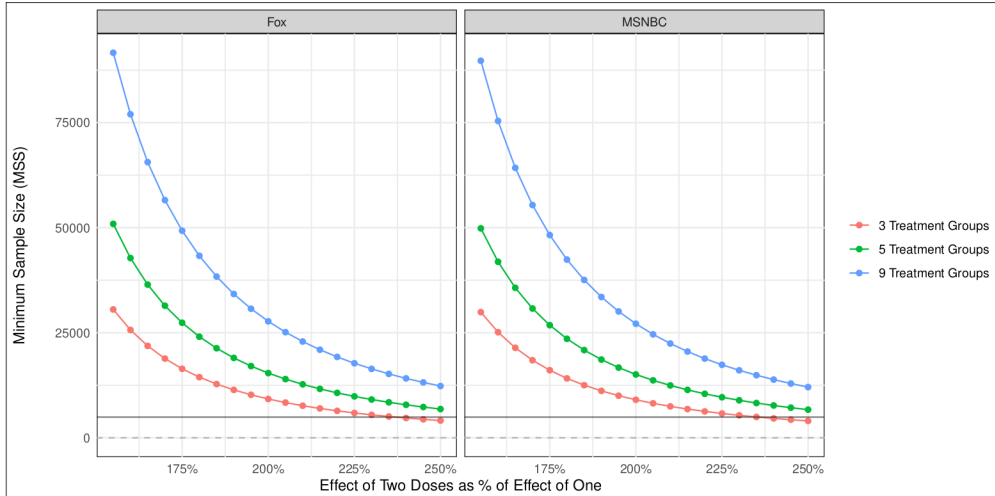


Figure 6: Minimum Sample Size (MSS) Needed For an Adequately Powered Experiment. This figure visualizes the number of observations needed to conduct an adequately powered experiment distinguishing the effect of a single dose of partisan media from the effect of two doses of partisan media. The x-axis represents assumed effect of two doses as a percent of the effect of a single dose. The solid gray line highlights our sample size in Experiment 1 (4,926), and the dotted gray line is at zero. Shading indicates whether we assumed there were 3, 5, or 9 treatment arms.

of an experimental design for assessing accumulation.

These power analyses indicate that an adequately powered experiment to test hypotheses about accumulative effects of partisan media would require an extremely large sample size. We consider it most plausible that the persuasive effect of a stimulus declines with repeated exposures, so that the effect of two doses would be less than 200% of the size of the effect of a single dose. However, even in the unlikely case that the effect did not decline in size with repeated exposure, an adequately powered experiment with all 9 treatment groups would require 27,144 respondents for the MSNBC treatment. Indeed, even if we were willing to reduce the experiment to 5 or 3 treatment groups, a choice that would eliminate our ability to estimate many other interesting quantities of interest — for instance, comparing the effects of Fox News vs. MSNBC relative to entertainment — an adequately powered experiment would still require 15,000 or 9,048 respondents, respectively. These calculations are slightly more pessimistic for the Fox treatment, but the substantive conclusion is not different — a very

large sample would be needed to conduct an adequately powered experiment.<sup>10</sup> These power analyses suggest that — even under favorable assumptions — examining the accumulative effects of partisan media in an experiment may be out of the range of feasibility for many researchers.

## Conclusion

Increasing consumer choice has led to concerns that viewers self-sort into ideologically consonant partisan news programs. If such partisan media is able to exercise a large persuasive effect over its viewers that accumulates over time and is durable, it may play a significant role in exacerbating political polarization.

To causally identify this persuasive effect, political scientists have turned to survey and lab experiments. In particular, most experiments studying the persuasive effects of partisan media use a one shot format where the outcome is measured almost immediately after assignment to treatment. This set up is unrealistic in two critical ways. First, in the real world, media consumers are repeatedly exposed to their favorite newspapers, websites, and cable news broadcasts. Such one shot experiments are unable to study how repeated doses of partisan media may accumulate to produce an ultimate change in the beliefs of partisan media consumers. Second, while readers and viewers might consume multiple doses, the time between these doses and when they engage in political behaviors (i.e. voting, organizing, and discussing politics) might be large. Consequently, if the persuasive effects of partisan media decay quickly, such one shot designs might overstate the importance of partisan media as a driver of political polarization.

In this paper, we presented the results of three experiments, each designed to address these critical shortcomings. All three experiments included multiple waves, allowing us to examine the persistence of persuasive effects. In all three experiments, we found evidence

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<sup>10</sup>Note, estimates of the MSS with confidence intervals are presented in Table A1 in Section A of the Supplementary Information.

that such persuasive effects can persist for over a week, suggesting that even a fleeting exposure to partisan media can result in durable opinion changes.

This finding suggests that the effect of partisan media on politics may be larger than is typically assumed. For example, chance exposure to a partisan news segment or clip a week before an election could lead to a significant change in voting behavior. This finding also suggests that the effect of partisan media on non-political viewers may be larger than previously supposed. While only hardened partisans are likely to regularly consume partisan media, a much larger, less polarized audience may be briefly exposed to partisan media within a week of voting or answering a survey.

In contrast to our findings about the persistence of the persuasive effects of partisan media, we find that the accumulation of persuasive effects from multiple doses of partisan media is effectively unknowable in an experimental framework. Indeed, we present power calculations suggesting that, based on our results from Experiment 1, an experiment adequately powered to detect this accumulation would need tens of thousands of respondents – outside the realm of the financial feasibility for most social scientists and the logistical possibility of most survey panels (e.g. Stewart et al., 2015). Consequently, we conclude that our results approach the limit of what can be learned from such multiwave experiments within the resource constraints that most researchers face without introducing strong modeling assumptions about the accumulation of these persuasive effects.

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**Supplementary Appendix for  
“Dynamic Persuasion: Decay and Accumulation of  
Partisan Media Persuasion”**



## A Power Calculation Details

Our power calculations focused on identifying the difference between the average outcome of respondents treated with two doses of the same partisan media rather than just a single dose. Specifically, we assumed that the effect of a single dose took on some value,  $\tau$ , and the effect of two doses was a multiple of that effect,  $\gamma$ . The difference between the two effects, will then be  $\gamma\tau - \tau = (\gamma - 1)\tau$ . Note, in both cases we assumed that the same control group is used to define both effects (that is, the entertainment twice group), so the sample value of this estimand is defined as the difference in average outcomes between respondents that two doses of partisan media and a single dose of partisan media. Consequently, this difference will be the difference between two equally sized groups of respondents that each contain 1/9 of the entire sample.

After defining our estimand this way, the estimation of the minimum sample size (MSS), is straightforward. Specifically, it will take the form:

$$\text{MSS} = M^2 \frac{\sigma^2}{.25(1-a)\frac{2}{9}(\gamma-1)^2\tau^2}$$

Where  $M = t_{1-\frac{\alpha}{2}} + t_{1-\beta}$ ,  $t_{1-\frac{\alpha}{2}}$  is the critical value to reject the null hypothesis, and  $t_{1-\beta}$  is the t-statistic for the alternative.  $a$  is also the attrition rate between waves. We divide by 2/9 because this analysis only uses 2/9 of the sample, as discussed above. For the power calculations in this section, we used the attrition rate we observed in Experiment 1 between waves 1 and 2 ( $\approx .12$ ), an  $\alpha$  of .05 and  $\beta$  of .2.

Table A1: Minimum Sample Size (MSS) Needed for 80% Power By Proportional Change in Treatment Effect ( $\gamma$ ) Based on Wave 1 Treatment

$\gamma$	Fox		MSNBC	
	MSS	95% CI Lower Bound	MSS	95% CI Lower Bound
1.25	443514	14547	434304	14491
1.50	110879	10428	108576	10361
1.75	49279	7839	48256	7774
2.00	27720	6107	27144	6047
2.25	17741	4892	17372	4838
2.50	12320	4006	12064	3958
2.75	9051	3341	8863	3299
3.00	6930	2829	6786	2791
3.25	5475	2426	5362	2392
3.50	4435	2103	4343	2073
3.75	3665	1841	3589	1814
4.00	3080	1625	3016	1600

Because the estimates for accumulative effects in Experiment 1 are very imprecise (as discussed in the main text), we do not rely on our point estimates for the accumulative effects from Experiment 1 for these calculations. In particular, the 95% confidence intervals for both Fox and MSNBC suggest that the effect of treatment with two doses is many times

greater or lesser than the wave 1 persuasive effects visualized in Figure 1, which we consider implausible. Instead, we considered  $\gamma$  to take on values between 1 and 4, although we focused our results in Figure 6 on the more plausible range of 1.5 to 3. Table A1 presents a broader set of results in tabular form. Table A1 also provides estimates for the MSS if the effect of treatment of a single dose is assumed to be at the edge of its 95% confidence interval that minimizes the MSS. Although the MSS calculations for more extreme values of  $\gamma$  suggest an adequately powered experiment is feasible, we believe that it is implausible for the effect of treatment with two doses to be this large relative to the effect of treatment with a single dose, as discussed in the main text. Similarly, the 95% confidence interval for these MSS estimates does include values that suggest an adequately powered experiment is possible, but we would consider it equally foolhardy to conduct a follow up experiment premised on such an extreme assumption.

## B Survey Demographics

This section presents some basic demographics about our samples for the three experiments. Specifically, Table A2 shows the distribution of education levels, TableA3 gives the gender distribution, Table A5 provides the breakdown of party id, and Table A4 presents the racial and ethnic composition of our sample.

	Experiment 1	Experiment 2	Experiment 3
Did Not Graduate High School	0.03	0.04	0.02
High School Graduate	0.32	0.31	0.20
Some College	0.22	0.25	0.20
2 Year Degree	0.10	0.08	0.11
4 Year Degree	0.22	0.18	0.27
Post Graduate Degree	0.10	0.14	0.20

Table A2: Distribution of Education Levels

	Experiment 1	Experiment 2	Experiment 3
Male	0.47	0.47	0.44
Female	0.53	0.53	0.55
Other	0.00	0.00	0.00

Table A3: Distribution of Gender

	Experiment 1	Experiment 2	Experiment 3
Asian and Pacific Islander	0.04	0.05	0.05
Black	0.08	0.13	0.08
Hispanic	0.10	0.05	0.04
Multi-Racial	0.03	0.03	0.03
Native American	0.01	0.01	0.01
Non-Hispanic White	0.74	0.72	0.77
Other	0.00	0.01	0.01

Table A4: Distribution of Race

	Experiment 1	Experiment 2	Experiment 3
Democrat	0.33	0.58	0.57
Independent	0.33	0.42	0.43
Other Party	0.01	0.58	0.57
Republican	0.32	0.42	0.43

Table A5: Distribution of Party Identification

## C Experiment Details

### C.1 Experiment 1 Stimuli

This section contains the text of all news articles included in Experiment 1. For each of the three news outlets (Fox News, MSNBC, and the Food Network), we created two articles by collating text from actual stories that appeared online. The MSNBC and Fox News articles had a very similar structure but varied in their ideological slant – that is, the Fox News articles espoused more conservative issue positions (i.e. opposed to marijuana legalization) and the MSNBC articles endorsed more liberal issue positions (i.e. supporting marijuana legalization). After being assigned to or choosing a given media outlet, respondents were asked to read both stories attributed to that source. All articles included two visual components that we omit here: a banner signaling the article’s source, as well as a stock photo related to the article’s topic.

#### **Marijuana Legalization: An Economic Bust?**

By Nicole Wilson — Published May 20, 2017 — Economy — FOXBusiness

The U.S. Congress Joint Economic Committee has scheduled a hearing next month on the potential economic impacts of the national legalization of recreational marijuana. In states that have legalized recreational marijuana such as Colorado, the sale of the drug is already a billion-dollar industry in states such as Colorado, where recreational marijuana is legal. Last year, Colorado pulled in \$200 million from taxing the drug. As the federal government begins to consider the implications of legalization, economics have been a big part of the discussion.

Opponents of legalization say that the potential tax money legalization would create is meaningless. The government would have to use the extra funds to treat problems caused by increased marijuana use. These issues include traffic accidents, medical emergencies, and the cost of regulating the drug.

One legalization opponent at a recent Washington, D.C. rally opposed the economic argument: “Marijuana is a dangerous drug. Legalization will create far more problems than it solves. The government will have to use any money it gets in taxes to pay for the damaging effects of marijuana.” Some potential costs the new revenue will have to cover include increased emergency room visits and treatment for those addicted to marijuana.

At the upcoming hearing, opponents of legalization hope to highlight the monetary costs of the marijuana debate. They hope to convince the Joint Economic Committee that the financial implications of a marijuana tax cannot be ignored.

**Public Safety Threatened By Marijuana Legalization, Opponents Say** Published June 3, 2017 By Arthur Davidson

The House Committee on Energy and Commerce has scheduled a series of hearings next month to explore national marijuana legalization. As the discussion gains traction in the House, public safety is a top concern for legislators. Anti-legalization advocates are working hard to promote their agendas to lawmakers. They say that legalization would make America a less safe place, as traffic accidents and other medical emergencies increase. As the hearings approach, these advocates hope to convince lawmakers of the dangers of marijuana legalization.

Legalization opponents claim that legalizing marijuana would make the country less safe

for every American. Marijuana is an intoxicant, and its use can lead to harmful, or even fatal, accidents. Research shows that where marijuana is legal, car accidents and other marijuana-related emergencies have increased significantly. Opponents like Rep. Margaret Brooke want to make this risk clear: “Marijuana users do not only cause harm to themselves. They make our roads more dangerous, and fill our hospitals. Legalization would introduce another intoxicant to this country, at a huge cost to public health and safety.” Legalization would make the drug more popular and widespread, creating a more dangerous environment for everyone.

As the hearings approach, anti-legalization groups are working hard on their case. The results of these hearings will have far-reaching consequences no matter what the committee decides.

### **D.H.S. Raises Violence Concerns: Marijuana Advocates Point to Legalization As Answer**

6/17/17 10:15 AM

By Maria Valdes

The U.S. Department of Homeland Security recently released statements about rising violence and illegal drug use in the U.S. The comments sparked another wave of debate over whether the federal government should legalize recreational marijuana. While marijuana is not the only drug sold illegally, it is the most commonly used illicit drug in the country. Supporters of marijuana say that legalization would greatly decrease illegal activity, which would make the U.S. a safer and healthier place to live.

Some say legalization would nearly eliminate the black market for marijuana. According to former National Drug Intelligence Center analyst Matt Petermann, “Legalization will help take the U.S. off the illegal drug trade map as a destination for marijuana. It will help eliminate violence associated with the drug trade. It is a step towards a safer America.” Farmers would legally be allowed to grow marijuana, which would remove the need for illegal drugs from other countries. This could then decrease the amount of violence in the U.S. caused by the international drug trade. This might even damage drug cartels’ other businesses, decreasing the supply of hard drugs such as heroin and cocaine to the U.S.

The Department of Homeland Security’s reports give new urgency to the debate over legalization. Supporters of the cause hope to see movement on Capitol Hill towards an embrace of national legalization.

### **Marijuana Is A Gateway Drug, Legalization Opponents Say**

Published July 8, 2017 By Moses Allen

In recent weeks, the debate in the House over the federal legalization of recreational marijuana has intensified. A bipartisan legalization bill is rumored to be in the works. The proposal is expected at some point in the coming weeks. The question of national legalization has caught Congress’ attention as public support for the measure increases quickly. Eight states have legalized recreational use so far.

Some legalization opponents claim that allowing people to use marijuana legally would encourage the use of more dangerous drugs like heroin and cocaine. If marijuana is legalized, they say, Americans would be more likely to use it because there is no longer a risk of getting caught. Marijuana can serve as a gateway drug, leading people towards more dangerous substances. More marijuana users means more users of harder illegal drugs.

For opponents such as Rep. Doug Hopper, the impact on hard drug use is very important.

“The drug epidemic in the United States has gone on for too long without a solution. I believe that legalizing marijuana will only increase the use of hard drugs that have destroyed so many American lives. Legal marijuana could threaten the personal health and quality of life of many Americans.”

As Washington waits for a bill to be introduced in the House, opponents of marijuana legalization hope to see recognition for the drug’s potential harms to the safety of Americans. Coverage of the bill will continue in the coming weeks.

### **7 Habits of Smart Supermarket Shoppers**

Practice these good habits to spend less time and money at the store.

1. Make a list. Organize your list into categories relevant to your household to save time spent scanning the list and aisles. Sticking to the list will curb impulse purchases, helping you make healthier decisions, remain on a budget and curb time spent browsing in aisles.
2. Stick to in-season produce. Fresh produce costs less in season, and it tastes better too. Buying it out of season means lower quality and higher prices.
3. Shop the perimeter. Stick to the outermost aisles of the store for the freshest options, which include produce, the meat and seafood departments, and the refrigerated dairy aisle. Fresh foods tend to be healthier than most ready-to-eat items typically found in the center aisles of a supermarket.
4. Read nutritional labels. Don’t fall victim to marketing claims stamped on the front of a package. Buzzwords such as “Healthy” or “All-Natural” may sound good, but to understand what you’re eating, scan nutritional labels, including the ingredients, to determine what you’re buying. Health-minded shoppers should take note of the saturated fat, sodium and sugar content for each serving.
5. Skip the samples. Snacking while shopping sends a message to your brain that it’s time to eat, which may trigger the urge to impulse shop.
6. Reach for the back. Supermarkets generally practice the stocking principle of arranging older items toward the front of the display. For the freshest options when it comes to foods like milk and ground meat, dig around at the back of the display case for items marked with later expiration or sell-by dates.
7. Be wary of deals. Strategic wording by supermarkets may fool shoppers into believing they’ve scored a deal — signs boasting “Two for \$8,” “Limit 8 per customer” or “Special” may imply a sale without offering a cut off the full retail price.

### **5 Ways You’re Being Set Up by Your Supermarket**

By: Teri Tsang Barrett

1. FIFO: Or, rather, the rule of First In, First Out. Retailers stock perishables so older items are pushed to the front, where consumers will reach them first. When shopping for items like ground beef or milk, check the back of the stack for later sell-by dates — and a fresher product.

2. Samples: The more time consumers spend with a product, the more likely they are to spend. Samples awaken the senses, triggering the impulse to consume.
3. Eye-level positioning: Take note of options above and below eye level, as the items consumers spot first on shelves are likely expensive brands that can afford the costly real-estate location afforded to premium pricing. Bulk items tend to be positioned along the lower shelves of an aisle, out of the line of sight.
4. Extra-large shopping carts: Buying more than we need has been made possible by our ability to easily contain it.
5. Store soundtracks: The music heard in a store is designed to trigger positive associations and encourage more time spent in the store — retailers know that more time in a store means more time to spend money.

## C.2 Experiment 1 Outcomes

The following section details the exact wording of all variables used to construct the outcome measures for Experiment 1. For grid questions that ask about issue opinions unrelated to marijuana policy, we only list those items that were included in our attitudinal index, though the full survey instrument is available on request.

- In the grid below, you will see a series of statements. Please tell us whether you agree or disagree with each statement.

*Response options: Strongly agree (1); Agree (2); Somewhat agree (3); Neither agree nor disagree (4); Somewhat disagree (5); Disagree (6); Strongly disagree (7)*

- The legalization of marijuana leads to fewer people using more serious drugs, such as heroin and cocaine

- Some people feel that habitual drug use should generally be considered a criminal offense and dealt with through the courts and criminal justice system. Suppose these people are on one end of the scale, at point 1. Others think that habitual drug use should generally be considered a substance abuse and addiction problem and dealt with through the medical and mental health systems. Suppose these people are at the other end, at point 7. And of course, some other people have opinions somewhere in between.

Where would you place YOURSELF on this scale?

*Response options range from 1 (criminal offense) to 7 (addiction problem)*

- In the grid below, you will see a series of statements. Please tell us whether you agree or disagree with each statement.

*Response options: Strongly agree (1); Agree (2); Somewhat agree (3); Neither agree nor disagree (4); Somewhat disagree (5); Disagree (6); Strongly disagree (7)*

- Marijuana should be legal for medical use



- Marijuana use increases violent crime
- In the grid below, you will see a series of statements. Please tell us whether you agree or disagree with each statement.  
*Response options: Strongly agree (1); Agree (2); Somewhat agree (3); Neither agree nor disagree (4); Somewhat disagree (5); Disagree (6); Strongly disagree (7)*
  - Using marijuana is morally wrong
  - Marijuana use increases violent crime
  - Marijuana should be legal for medical use
  - Marijuana should be legal for recreational use
- If the sale and possession of marijuana were made legal, do you think it would make the economy better, make the economy worse, or have no effect on the economy?  
*Response options:*
  1. Make the economy much better
  2. Make the economy somewhat better
  3. No effect
  4. Make the economy somewhat worse
  5. Make the economy much worse
- In the grid below, you will see a series of statements. Please tell us whether you agree or disagree with each statement.
- How dangerous would you rate use of the following substances? *Response options: Very dangerous (1), Somewhat dangerous (2), Not sure (3), Very safe (4)*
  - Marijuana

### C.3 Experiments 2 and 3 Stimuli

This section contains the text of all news articles included in Experiments 2 and 3. For each of the three news outlets (Fox News, MSNBC, and the Food Network), we created two articles by collating text from actual stories that appeared online. The MSNBC and Fox News articles had a very similar structure but varied in their ideological slant – that is, the Fox News articles espoused more conservative issue positions (i.e. opposed to breaking up big tech) and the MSNBC articles endorsed more liberal issue positions (i.e. supporting breaking up big tech). After being assigned to or choosing a given media outlet, respondents were asked to read both stories attributed to that source. All articles included two visual components that we omit here: a banner signaling the article’s source, as well as a stock photo related to the article’s topic.

**Misinformation and Why Breaking Up Big Tech Might Help** 5/17/21 10:15 AM  
By Maria Valdes

Today, most global internet activity happens on services owned by either Facebook or Alphabet, which includes YouTube and Google. The internet has consolidated into this pair of monopolies who maintain their size by designing their services to maximize “engagement” in ways that spread misinformation. Improving the quality of information people interact with can only be accomplished by breaking up these big tech companies.

Maximizing engagement comes at a cost to the consumer. Sadly, algorithms designed to increase dependency and usage are far more profitable than ones that would encourage timely, local, relevant and – most importantly – accurate information. The truth, in a word, is boring. Facts rarely animate the kind of compulsive engagement rewarded by recommendation and search algorithms. Instead, misinformation and half-truths get more attention and engagement from consumers.

Information online would be more accurate if these large tech companies were not as large. For instance, they might attract new consumers by offering new products and services rather than maximizing engagement. This could reduce their incentive to allow misinformation to spread on their platforms. The best tool – if not the only tool – to hold big tech accountable for this misinformation is antitrust enforcement.

The government needs to do its job. The spread of misinformation online has been enabled by the absence of antitrust enforcement by the federal government. Without this enforcement, we can’t rein in out-of-control monopolies like as Facebook and Google. Solving this problem will require action by Congress to make these companies smaller in order to slow misinformation’s spread.

#### **Time to Break Up Big Tech?** 5/17/21 10:15 AM By Maria Valdes

Questions about breaking up companies such as Amazon, Google, and Facebook are swirling around political circles. America’s largest technology companies — Amazon, Facebook and Google — have grown big and powerful. Google has an 88 percent market share in search advertising, Facebook owns 77 percent of mobile social traffic and Amazon has a 74 percent share in the e-book market. In economic terms, all three companies are monopolies. Would breaking them up help or harm consumers?

This is a question with a clear answer: breaking up the companies would definitely help consumers. The existence of these technology monopolies has resulted in no new major social networking companies being founded since 2011. Breaking up companies like Google, Facebook and Amazon will stimulate competition and allow new companies to create competitive products at lower prices to consumers.

Many of these monopolistic firms have used predatory tactics to marginalize or eliminate competitors. An investigation by the Congressional Antitrust Subcommittee showed that Google used its massive power to prevent competitors from appearing in its online search results. Consumers understandably believe Google’s search function returns the most relevant results. But in truth, Google search results often favor companies that Google owns or with whom it has financial relationships. This is another way to unfairly limit competition.

We have long known that antitrust enforcement to break up big companies spurs competition and ingenuity, while re-empowering citizens. While it’s true that Amazon, Facebook and Google do many good things, their size and growing power over our lives pose serious dangers that Congress cannot ignore. Using antitrust law to break them up would stimulate innovation and help consumers.

#### **Why to Not Break Up Big Tech** By Nicole Wilson — Published May 20, 2021

Today, most global internet activity happens on services owned by either Facebook or and Google. The internet has consolidated into this pair of monopolies who maintain their size by optimizing their services to maximize “engagement” in ways that spread misinformation. While accountability is important, the quality of information online won’t be improved by breaking up private companies.

The giants of social media — Facebook, Twitter, YouTube, Instagram — make and enforce rules to keep their communities attractive to consumers. Unlike the government, these companies are free to boot anyone or anything they consider disruptive. In fact they already remove some content for breaking their rules. For example, Facebook and Google have tens of thousands of content moderators to root out bad content on their sites. The companies also use artificial intelligence and machine learning technology to identify content that violates their terms of service. They use warning labels and deletions to clamp down on misinformation.

Information online wouldn’t be any more accurate if these companies were smaller. Facebook and Google are already taking action to limit misinformation’s spread on their platforms. The tools of antitrust enforcement that some people have suggested be used on big tech companies would do nothing to reduce misinformation.

Being mad at tech companies for misinformation online is understandable, but antitrust enforcement is not a silver bullet solution. Breaking up these companies and making them smaller will not solve the problem of misinformation’s spread.

**Why Breaking Up Big Tech Hurts Consumers and the Economy** By Nicole Wilson — Published May 20, 2021 — Economy — FOXBusiness

Questions about breaking up companies such as Amazon, Google, and Facebook are swirling around political circles. America’s largest technology companies have grown big and powerful. Google has an 88 percent market share in search advertising, Facebook owns 77 percent of mobile social traffic and Amazon has a 74 percent share in the e-book market. In economic terms, all three companies are monopolies. Would breaking them up help or harm consumers?

This is a question with a clear answer: breaking up the companies would only hurt consumers. Big tech companies give consumers free products and services. Google offers a free, robust search engine, along with many other free services. Facebook provides the ability to connect with vast numbers of people online for no charge.

Breaking up Google or Facebook could result in fewer consumer benefits or charges for these services. When it comes to Amazon, the sheer size of the company is what makes its service so desirable. If the government broke up Amazon, the consumer would be worse off, facing higher shipping costs, less convenient access to goods, and less reliable services.

The calls to use antitrust enforcement to break up these large tech companies stem from a fundamental misunderstanding of their operations. Yes, each of the big tech companies – Google, Facebook, and Amazon – have large operations. But their operations are successful because they are spread across multiple products and services. None of those companies are actually monopolies. Using anti-trust law to break them up would not do any good and would only hurt consumers.

### **7 Habits of Smart Supermarket Shoppers**

Practice these good habits to spend less time and money at the store.

1. Make a list. Organize your list into categories relevant to your household to save time spent scanning the list and aisles. Sticking to the list will curb impulse purchases, helping you make healthier decisions, remain on a budget and curb time spent browsing in aisles.
2. Stick to in-season produce. Fresh produce costs less in season, and it tastes better too. Buying it out of season means lower quality and higher prices.
3. Shop the perimeter. Stick to the outermost aisles of the store for the freshest options, which include produce, the meat and seafood departments, and the refrigerated dairy aisle. Fresh foods tend to be healthier than most ready-to-eat items typically found in the center aisles of a supermarket.
4. Read nutritional labels. Don't fall victim to marketing claims stamped on the front of a package. Buzzwords such as "Healthy" or "All-Natural" may sound good, but to understand what you're eating, scan nutritional labels, including the ingredients, to determine what you're buying. Health-minded shoppers should take note of the saturated fat, sodium and sugar content for each serving.
5. Skip the samples. Snacking while shopping sends a message to your brain that it's time to eat, which may trigger the urge to impulse shop.
6. Reach for the back. Supermarkets generally practice the stocking principle of arranging older items toward the front of the display. For the freshest options when it comes to foods like milk and ground meat, dig around at the back of the display case for items marked with later expiration or sell-by dates.
7. Be wary of deals. Strategic wording by supermarkets may fool shoppers into believing they've scored a deal — signs boasting "Two for \$8," "Limit 8 per customer" or "Special" may imply a sale without offering a cut off the full retail price.

Strategic wording by supermarkets may fool shoppers into believing they've scored a deal — signs boasting "Two for \$8," "Limit 8 per customer" or "Special" may imply a sale without offering a cut off the full retail price.

### **5 Ways You're Being Set Up by Your Supermarket**

By: Teri Tsang Barrett

1. FIFO: Or, rather, the rule of First In, First Out. Retailers stock perishables so older items are pushed to the front, where consumers will reach them first. When shopping for items like ground beef or milk, check the back of the stack for later sell-by dates — and a fresher product.
2. Samples: The more time consumers spend with a product, the more likely they are to spend. Samples awaken the senses, triggering the impulse to consume.
3. Eye-level positioning: Take note of options above and below eye level, as the items consumers spot first on shelves are likely expensive brands that can afford the costly real-estate location afforded to premium pricing. Bulk items tend to be positioned along the lower shelves of an aisle, out of the line of sight.

4. Extra-large shopping carts: Buying more than we need has been made possible by our ability to easily contain it.
5. Store soundtracks: The music heard in a store is designed to trigger positive associations and encourage more time spent in the store — retailers know that more time in a store means more time to spend money.

## C.4 Experiments 2 and 3 Outcomes

The following section details the exact wording of all variables used to construct the outcome measures for Experiments 2 and 3.

- Which statement comes closer to your own view, even if neither is exactly right?

*Response Options:*

- The scale and efficiency of large tech companies like Apple, Amazon, Facebook, and Google benefits consumers more than it hurts them
- Large tech companies like Apple, Amazon, Facebook, and Google use their size to gain an unfair advantage over competitors and disadvantage consumers
- Both come equally close to my view

*Respondents that chose one of the first two options were asked if the statement came very or somewhat close to their own view. Respondents who chose the third option were asked if they leaned one way or the other or if they were truly unsure.*

- Federal regulators are empowered by law to break up a very large company into several smaller ones when the concentration of power and influence harms consumers. Which of the following companies, if any, would you like to see broken up in this way?

*Response Options*

- PepsiCo
- Microsoft
- Facebook
- Google
- Apple
- Dell
- Amazon
- Bank of America
- Comcast

- Which statement comes closer to your own view, even if neither is exactly right?

*Response Options*

- Social networks like Facebook and Twitter should allow their users to freely express their views, even if it means allowing false, offensive, or harmful content to circulate
- Social networks like Facebook and Twitter should do more to remove false, offensive, or harmful content from their platforms
- Both come equally close to my view

*Respondents that chose one of the first two options were asked if the statement came very or somewhat close to their own view. Respondents who chose the third option were asked if they leaned one way or the other or if they were truly unsure.*

- Which statement comes closer to your own view, even if neither is exactly right?

*Response Options*

- Big tech companies do a good job of keeping their users' information secure
- Big tech companies do not do a good job of keeping their users' information secure
- Both come equally close to my view

*Respondents that chose one of the first two options were asked if the statement came very or somewhat close to their own view. Respondents who chose the third option were asked if they leaned one way or the other or if they were truly unsure.*

- Which statement comes closer to your own view, even if neither is exactly right?

*Response Options*

- Congress should allow large tech companies to store and use data on their users as they see fit
- Congress should more actively regulate how large tech companies gather and store data on their users
- Both come equally close to my view

- Which statement comes closer to your own view, even if neither is exactly right?

*Respondents that chose one of the first two options were asked if the statement came very or somewhat close to their own view. Respondents who chose the third option were asked if they leaned one way or the other or if they were truly unsure.*

- Which statement comes closer to your own view, even if neither is exactly right?

*Response Options*

- The influence of big tech companies on political life in America is often exaggerated
- Big tech companies exert too much influence over the political life in America
- Both come equally close to my view

*Respondents that chose one of the first two options were asked if the statement came very or somewhat close to their own view. Respondents who chose the third option were asked if they leaned one way or the other or if they were truly unsure.*

- How favorable or unfavorable of an opinion do you have of each of the following organizations?

*Response options: Very unfavorable, Unfavorable, Somewhat unfavorable, Neither favorable nor unfavorable, Somewhat favorable, Favorable, Very favorable*

- PepsiCo
- Microsoft
- Apple
- Comcast
- Facebook
- Amazon
- Dell
- Google
- Bank of America

## D Treatment Effects for Individual Questions

This section provides results about the effect of treatment on all of the individual outcome questions included in our experiments. All estimates are based on a simple difference in means between the Fox and MSNBC treatment and the Entertainment treatment. In all tables, the first column provides the effect of treatment in the first wave on the first wave outcome, while the second shows the effect of treatment in the first wave on the second wave outcome. See Section C for details on the question wording and coding of responses.

### D.1 Results From Experiment 1

Table A6: Effect of treatment on whether government efforts to enforce marijuana laws cost more than they are worth

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	0.164 (0.123)	0.152 (0.128)
MSNBC	-0.021 (0.125)	-0.087 (0.132)
Observations	1,191	1,071
R <sup>2</sup>	0.002	0.003
Adjusted R <sup>2</sup>	0.001	0.001
Residual Std. Error	1.743 (df = 1188)	1.729 (df = 1068)
F Statistic	1.363 (df = 2; 1188)	1.768 (df = 2; 1068)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	



Table A7: Effect of treatment on whether the legalization of marijuana leads to fewer people using more serious drugs, such as heroin and cocaine

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	0.291** (0.132)	0.309** (0.139)
MSNBC	-0.144 (0.134)	0.024 (0.143)
Observations	1,189	1,070
R <sup>2</sup>	0.009	0.006
Adjusted R <sup>2</sup>	0.008	0.004
Residual Std. Error	1.869 (df = 1186)	1.873 (df = 1067)
F Statistic	5.641*** (df = 2; 1186)	3.106** (df = 2; 1067)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A8: Effect of treatment on whether drug use is a health problem v criminal issue

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.113 (0.116)	0.062 (0.125)
MSNBC	0.013 (0.118)	0.064 (0.128)
Observations	1,192	1,071
R <sup>2</sup>	0.001	0.0003
Adjusted R <sup>2</sup>	-0.0005	-0.002
Residual Std. Error	1.643 (df = 1189)	1.685 (df = 1068)
F Statistic	0.714 (df = 2; 1189)	0.165 (df = 2; 1068)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A9: Effect of treatment on whether marijuana use is morally wrong

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.062 (0.137)	-0.082 (0.145)
MSNBC	0.157 (0.140)	0.187 (0.150)
Observations	1,192	1,071
R <sup>2</sup>	0.002	0.003
Adjusted R <sup>2</sup>	0.001	0.001
Residual Std. Error	1.954 (df = 1189)	1.964 (df = 1068)
F Statistic	1.310 (df = 2; 1189)	1.740 (df = 2; 1068)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table A10: Effect of treatment on whether marijuana use increases violent crime

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.031 (0.098)	-0.130 (0.140)
MSNBC	0.023 (0.100)	0.092 (0.145)
Observations	1,191	1,071
R <sup>2</sup>	0.0002	0.002
Adjusted R <sup>2</sup>	-0.001	0.0005
Residual Std. Error	1.398 (df = 1188)	1.900 (df = 1068)
F Statistic	0.148 (df = 2; 1188)	1.253 (df = 2; 1068)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table A11: Effect of treatment on whether marijuana should be legal for medical use

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.024 (0.080)	0.069 (0.110)
MSNBC	-0.009 (0.082)	0.003 (0.113)
Observations	1,191	1,071
R <sup>2</sup>	0.0001	0.0005
Adjusted R <sup>2</sup>	-0.002	-0.001
Residual Std. Error	1.142 (df = 1188)	1.489 (df = 1068)
F Statistic	0.047 (df = 2; 1188)	0.253 (df = 2; 1068)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table A12: Effect of treatment on whether marijuana legalization makes the economy better

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	0.117* (0.071)	0.171** (0.078)
MSNBC	-0.138* (0.073)	0.020 (0.081)
Observations	1,192	1,070
R <sup>2</sup>	0.011	0.005
Adjusted R <sup>2</sup>	0.009	0.003
Residual Std. Error	1.014 (df = 1189)	1.060 (df = 1067)
F Statistic	6.336*** (df = 2; 1189)	2.856* (df = 2; 1067)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table A13: Effect of treatment on whether marijuana use is a serious problem today

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.120 (0.138)	-0.232 (0.146)
MSNBC	-0.033 (0.141)	-0.104 (0.151)
Observations	1,191	1,069
R <sup>2</sup>	0.001	0.002
Adjusted R <sup>2</sup>	-0.001	0.0005
Residual Std. Error	1.964 (df = 1188)	1.976 (df = 1066)
F Statistic	0.404 (df = 2; 1188)	1.264 (df = 2; 1066)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table A14: Effect of treatment on whether marijuana should be legal for recreational use

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	0.232 (0.146)	0.256* (0.154)
MSNBC	-0.196 (0.149)	-0.082 (0.158)
Observations	1,192	1,069
R <sup>2</sup>	0.007	0.005
Adjusted R <sup>2</sup>	0.005	0.003
Residual Std. Error	2.068 (df = 1189)	2.076 (df = 1066)
F Statistic	4.292** (df = 2; 1189)	2.633* (df = 2; 1066)

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table A15: Effect of treatment on how dangerous is marijuana

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.072* (0.038)	-0.022 (0.045)
MSNBC	-0.027 (0.038)	-0.041 (0.046)
Observations	1,192	1,068
R <sup>2</sup>	0.003	0.001
Adjusted R <sup>2</sup>	0.001	-0.001
Residual Std. Error	0.535 (df = 1189)	0.603 (df = 1065)
F Statistic	1.884 (df = 2; 1189)	0.395 (df = 2; 1065)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

## D.2 Results From Experiment 2

Table A16: Effect of treatment on whether the size of big tech is good for consumers

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.612*** (0.098)	-0.235* (0.130)
MSNBC	0.281*** (0.098)	0.166 (0.131)
Observations	3,161	1,761
R <sup>2</sup>	0.026	0.005
Adjusted R <sup>2</sup>	0.026	0.004
Residual Std. Error	2.253 (df = 3158)	2.229 (df = 1758)
F Statistic	42.906*** (df = 2; 3158)	4.830*** (df = 2; 1758)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A17: Effect of treatment on whether social networks should remove more false, offensive, misleading, and harmful content

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.266*** (0.101)	-0.183 (0.136)
MSNBC	-0.102 (0.101)	-0.189 (0.137)
Observations	3,158	1,752
R <sup>2</sup>	0.002	0.001
Adjusted R <sup>2</sup>	0.002	0.0003
Residual Std. Error	2.328 (df = 3155)	2.336 (df = 1749)
F Statistic	3.516** (df = 2; 3155)	1.233 (df = 2; 1749)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A18: Effect of treatment on whether big tech does a good job of keeping user info secure

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.041 (0.098)	-0.010 (0.128)
MSNBC	0.127 (0.098)	0.143 (0.129)
Observations	3,155	1,759
R <sup>2</sup>	0.001	0.001
Adjusted R <sup>2</sup>	0.0004	-0.0001
Residual Std. Error	2.250 (df = 3152)	2.204 (df = 1756)
F Statistic	1.581 (df = 2; 3152)	0.881 (df = 2; 1756)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A19: Effect of treatment on whether congress should do more to regulate how big tech gather data

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.113 (0.088)	-0.179 (0.112)
MSNBC	-0.056 (0.088)	-0.016 (0.113)
Observations	3,150	1,754
R <sup>2</sup>	0.001	0.002
Adjusted R <sup>2</sup>	-0.0001	0.001
Residual Std. Error	2.027 (df = 3147)	1.921 (df = 1751)
F Statistic	0.828 (df = 2; 3147)	1.568 (df = 2; 1751)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A20: Effect of treatment on whether big tech companies exert too much influence over the political life in america

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.256*** (0.094)	-0.192 (0.122)
MSNBC	0.064 (0.095)	0.088 (0.123)
Observations	3,148	1,761
R <sup>2</sup>	0.004	0.003
Adjusted R <sup>2</sup>	0.003	0.002
Residual Std. Error	2.171 (df = 3145)	2.096 (df = 1758)
F Statistic	6.342*** (df = 2; 3145)	2.751* (df = 2; 1758)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A21: Effect of treatment on favorability of big tech companies

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	0.040 (0.058)	-0.053 (0.074)
MSNBC	-0.121** (0.058)	-0.158** (0.075)
Observations	3,155	1,756
R <sup>2</sup>	0.003	0.003
Adjusted R <sup>2</sup>	0.002	0.001
Residual Std. Error	1.330 (df = 3152)	1.273 (df = 1753)
F Statistic	4.098** (df = 2; 3152)	2.309* (df = 2; 1753)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	



### D.3 Results From Experiment 3

Table A22: Effect of treatment on whether the size of big tech is good for consumers

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.383*** (0.108)	-0.068 (0.152)
MSNBC	0.163 (0.110)	0.247 (0.154)
Observations	2,770	1,416
R <sup>2</sup>	0.010	0.003
Adjusted R <sup>2</sup>	0.009	0.002
Residual Std. Error	2.340 (df = 2767)	2.352 (df = 1413)
F Statistic	13.309*** (df = 2; 2767)	2.333* (df = 2; 1413)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A23: Effect of treatment on whether social networks should remove more false, offensive, misleading, and harmful content

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.120 (0.113)	-0.174 (0.156)
MSNBC	-0.129 (0.115)	-0.260 (0.158)
Observations	2,763	1,411
R <sup>2</sup>	0.001	0.002
Adjusted R <sup>2</sup>	-0.0001	0.001
Residual Std. Error	2.451 (df = 2760)	2.409 (df = 1408)
F Statistic	0.800 (df = 2; 2760)	1.407 (df = 2; 1408)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A24: Effect of treatment on whether big tech does a good job of keeping user info secure

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.396*** (0.106)	-0.088 (0.149)
MSNBC	-0.078 (0.108)	-0.097 (0.151)
Observations	2,773	1,412
R <sup>2</sup>	0.006	0.0004
Adjusted R <sup>2</sup>	0.005	-0.001
Residual Std. Error	2.305 (df = 2770)	2.294 (df = 1409)
F Statistic	7.810*** (df = 2; 2770)	0.256 (df = 2; 1409)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A25: Effect of treatment on whether congress should do more to regulate how big tech gather data

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.319*** (0.102)	-0.078 (0.137)
MSNBC	-0.082 (0.103)	-0.072 (0.139)
Observations	2,763	1,408
R <sup>2</sup>	0.004	0.0003
Adjusted R <sup>2</sup>	0.003	-0.001
Residual Std. Error	2.200 (df = 2760)	2.109 (df = 1405)
F Statistic	5.346*** (df = 2; 2760)	0.197 (df = 2; 1405)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A26: Effect of treatment on whether big tech companies exert too much influence over the political life in america

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	-0.262** (0.104)	0.087 (0.143)
MSNBC	0.028 (0.106)	0.192 (0.145)
Observations	2,755	1,409
R <sup>2</sup>	0.003	0.001
Adjusted R <sup>2</sup>	0.003	-0.0002
Residual Std. Error	2.251 (df = 2752)	2.205 (df = 1406)
F Statistic	4.712*** (df = 2; 2752)	0.879 (df = 2; 1406)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table A27: Effect of treatment on favorability of big tech companies

	<i>Dependent variable:</i>	
	Wave 1	Wave 2
	(1)	(2)
Fox	0.124* (0.065)	0.119 (0.090)
MSNBC	-0.125* (0.066)	0.001 (0.091)
Observations	2,765	1,415
R <sup>2</sup>	0.005	0.002
Adjusted R <sup>2</sup>	0.004	0.0002
Residual Std. Error	1.412 (df = 2762)	1.390 (df = 1412)
F Statistic	7.166*** (df = 2; 2762)	1.147 (df = 2; 1412)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	