

The Modest Consequences of Social Media for Major Political Communication Processes: Evidence from a Field Experiment in France*

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Abstract

A growing portion of people in advanced democracies use social media to get at least some of their political news. How does this social media use alter the longstanding ways that they interact with the overall media system? We use a preregistered randomized field experiment to study the consequences of social media use for several phenomena that have long been prominent in the political communication literature. The experiment incentivized those in a treatment group to deactivate their Facebook accounts during the 2022 French presidential election campaign. We find that Facebook use increases the power of media agenda-setting and may (by one measure) decrease people's tendencies to live in ideological online echo chambers. We find no detectable effect of Facebook use on trust in the mainstream media or trust in social media. We also review a finding we reported in another paper that Facebook use increases people's knowledge of real mainstream news stories and has no effect on receptivity to disinformation. We argue that, taken together, these findings cast doubt on fears that social media will worsen various negative trends in political media use. If anything, social media seems to intensify longstanding media effects like agenda setting, which have been common since the broadcast news era.

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1 The Changing Media Environment

Modern political communication scholarship began during what some have called the “broadcast era” of the mid-twentieth century. In the United States and other democracies in this era, people’s options for political news were dominated by relatively few national radio and television networks, plus a selection of newspapers that varied in number depending on one’s location (Emery, Emery, and Roberts, 2000; West, 2001).¹ At the same time, as competition was low, the global spread of the “news paradigm” among dominant news organizations and the journalism profession increased the homogenization of content (Mindich, 1996; Pottker, 2005; Schudson, 1990, 2005; Stensaas, 1986, 2005).² Taken together, in the mid-twentieth century, consumers had vastly fewer options for news and entertainment media than they would in subsequent eras (Emery, Emery, and Roberts, 2000; West, 2001; Prior, 2007; Dunaway and Graber, 2022). Most of the seminal scholarly studies of the relationship between the political mass media and public opinion took place during this era (e.g., McCombs and Shaw, 1972; Becker and McCombs, 1978; Iyengar and Kinder, 1987; Page, Shapiro, and Dempsey, 1987; Zaller, 1992, 1996; Bartels, 1993; Hetherington, 1996).

The spread of cable television and internet access led to the growth and diversification of media options in the 1990s and 2000s. The typical person’s available media choices grew dramatically, both in number of outlets and in the styles of content (Davis and Owen, 1998; West, 2001; Prior, 2007; Dunaway and Graber, 2022). Understanding this change was a major challenge for, and focus of, political communication research. Among other things, this explosion in media options

¹In the United States at least, the radio and television industries, which become major sources of news in the early twentieth century, were less competitive than the newspaper industry had been historically. But the newspaper industry itself also became less competitive in the early twentieth century. The number of American cities with at least two competing newspapers dropped from 57.1% in 1910 to 20.6% in 1930 (Emery, Emery, and Roberts, 2000, 289), and another estimate places it at 2% of cities by 2000 (West, 2001, 57). In his classic book, *Public Opinion and American Democracy*, Key (1961, 394) observed that the American news media were distinctive for “the uniformity of their content,” because even the competing national news outlets depicted “a fairly uniform picture of the political world to all classes and kinds of people.”

²What some call the “news paradigm” consisted of a greater reliance on official government sources for news (Bennett, 1990; Entman and Page, 1994; Bennett, Lawrence, and Livingston, 2008; Zaller and Chiu, 2000; Livingston and Bennett, 2003) as well as a greater use of the inverted pyramid style of newspaper writing (Pottker, 2005; Stensaas, 1986, 2005). When this paradigm was adopted varied across different countries (Hoyer and Pottker, 2005).

and greater personal discretion over types of media exposure seems to have increased the variance in political information levels across the U.S. population (e.g., [Prior, 2005, 2007](#)), as well as increased people’s ability to self-select into political news whose messages they already agree with, somewhat reducing the size of media effects on public opinion (e.g., [Bennett and Iyengar, 2008](#); [Arceneaux, Johnson, and Murphy, 2012](#); [Arceneaux and Johnson, 2013](#)).³

In the last two decades, yet another major change in the mass media environment has caused political communication scholars to again reassess past conclusions: the rise of social media. While many people still use newspapers or cable or broadcast television or go directly to websites to get information about the world, an increasing portion of the public worldwide gets news from popular social media platforms like Facebook, Instagram, TikTok, X (formerly Twitter), and others ([Hope, 2015](#); [Walker and Matsa, 2021](#); [Auxier and Anderson, 2021](#)). Political communication scholars and many other observers were initially hopeful that social media would democratize the political media environment. However, in recent years, many people have become more pessimistic about the normative consequences of more and more people’s engagement with political messages coming through social media (e.g., [Zhao, 2014](#)). People have been especially concerned that social media use may destabilize how other types of media influence and inform the public, reduce people’s exposure to diverse conversations and political views, increase their susceptibility to misinformation, and reduce their trust in the media.

2 Some Major Ways that People Interact with the Political Media System

In this paper, we examine the consequences of social media use for several phenomena that have been central in the political communication literature. Given that increasing numbers of people use social media as a significant, or sometimes primary, way of encountering news, it is natural to wonder if the major ways that people interacted with the media in earlier media eras have changed. How is overall political media use different in the social media era? This study tries

³But see [Brookman and Kalla \(2022, 2023\)](#) for recent work on the effects of cable news on the mass public.

to answer that question.

One of the most studied types of media effects on public opinion in the field of political communication is agenda setting, in its various forms. Agenda setting is the simple but powerful idea that, whether or not media messages tell you what to think, they do tell you “what to think about” (e.g., [Cohen, 1963](#); [Iyengar and Kinder, 1987](#); [McCombs, 2014](#); [McCombs and Valenzuela, 2021](#)). The term agenda setting was introduced into the political communication literature by [McCombs and Shaw \(1972\)](#), and has since been developed and applied in many studies (e.g., [Shaw and McCombs, 1977](#); [Iyengar and Kinder, 1987](#); [McCombs and Guo, 2014](#); [Protest and McCombs, 2016](#); [McCombs, 2014](#); [McCombs and Valenzuela, 2021](#)).⁴ There are various types of agenda setting, and other media effects related to or overlapping with it. There are frequent, and sometimes large, disagreements in print, even among the most accomplished scholars in this area, about how to define different types of agenda setting effects (e.g., [Chong and Druckman, 2007](#); [McCombs and Valenzuela, 2021](#)).

In our study, we examine what [McCombs \(2014, ch. 3\)](#) calls “first level agenda setting” or “traditional agenda setting” in his typology of agenda setting effects. This is the effect of media coverage of a some issues more than others on which issues people report in survey questions that they believe are the most important. The most influential treatment of agenda setting in political science is Iyengar and Kinder [Iyengar and Kinder \(1987\)](#), which focuses on first level (although they did not use that term) agenda setting for roughly the first half of the book (chapters 1-6), and on “priming” in the remaining empirical chapters.⁵ In the rest of this paper, we will, in all

⁴Agenda setting is sometimes used with a hyphen (“agenda-setting”) and sometimes not. Here we will not use the hyphen unless directly quoting an author who does.

⁵[McCombs \(2014\)](#) uses the following three categories to classify types of agenda setting. “First level” or “traditional” agenda setting is when “the degree of emphasis placed on issues in the news influences the priority accorded those issues by the public” (39). It is “the transmission of [attitude] object salience” (41). “Second level” agenda setting refers to the “transmission of attribute salience” (41) He explains it as “In agenda setting-theory, attribute is a generic term encompassing the full range of properties and traits that characterize an [attitude] object” (41). Finally, [McCombs \(2014, 55\)](#) labels as “third level agenda-setting” when media coverage “transfer[s] the relationships among elements of the media agenda to the public agenda.” As you can see, the concept of second level agenda setting is very similar to what other scholars call “framing” and also arguably to what some scholars call priming (see [McCombs \(2014, 57-59\)](#)). As [Chong and Druckman \(2007\)](#) point out, the definitions of framing and priming are inconsistent in the literature and arguably substantially overlapping, and how to measure priming has been the subject of heated debate and revisionism in recent years ([Lenz, 2009, 2012](#); [Tesler, 2015](#)). Our study side-steps much of this conceptual and methodological controversy by focusing only on first level agenda setting.

cases, refer to first level agenda setting unless we specify otherwise, but for brevity we will simply refer to this as agenda setting.

On the one hand, it is reasonable to suspect that social media use might disrupt the process of agenda setting as it worked in previous media eras. Social media use may distract people from paying as close attention to other major news sources, weakening their agenda-setting role. On the other hand, it is possible that social media feeds bring news content (and the topics that major news organizations are focusing on) to more people than would seek it out on their own, leading social media to actually enhance the agenda setting power of prominent news organizations.

A second major focus of scholars who study media effects (in all eras reviewed above) has been understanding to what extent people choose to use media sources whose messages they already agree with, and as a result receive messages that reinforce or intensify their prior political outlook (e.g., Lazarsfeld, Berelson, and Gaudet, 1948; Berelson, Lazarsfeld, and McPhee, 1954; Katz, 1996; Iyengar, Hahn, and Prior, 2001; Iyengar and Hahn, 2009; Iyengar et al., 2008; Stroud, 2008, 2011; Guess, 2021). The motivation for this type of research is often the belief that a more diverse media diet improves the quality of people’s decision-making by exposing them to new information and allowing them to participate in some type of collective deliberation (Habermas, 1985; Mutz, 2006; Shapiro, 2013; Sunstein, 2018).

While some studies have found evidence that media “echo chambers” are widespread, especially in the cable/internet era (Stroud, 2008, 2011), other studies have been more skeptical that modern forms of media increase the prevalence of people in media echo chambers (Mutz and Martin, 2001; Barberá, 2015; Gentzkow and Shapiro, 2011; Guess, 2021). An important series of observational studies finds that ideological segregation (i.e., echo chambers) is less prevalent when web browsing and using social media than in other types of media use (Gentzkow, Shapiro, and Sinkinson, 2011; Barberá et al., 2015; Eady et al., 2019; Guess, 2021; Muise et al., 2022; Wojcieszak et al., 2022). Our study allows us to perform an experimental test of whether social media access increases or reduces the degree to which people’s online media diets constitute ideological echo chambers.

A third major focus of media effects research has been trust in the media. Scholars have examined the causes and consequences of trust in the media in general, trust in different types

of media (such major newspapers, broadcast networks, cable news, radio, social media, etc), and trust in specific news outlets (such as the New York Times, National Public Radio, Fox News, CNN, etc). Trust in the news media in general has declined in most wealthy democracies in the past 40 years (Tsfati, 2002, 2003; Gronke and Cook, 2007; Ladd, 2010a, 2012; Arceneaux, Johnson, and Murphy, 2012; Tsfati and Ariely, 2014; Ladd and Podkul, 2020) .⁶ At the same time, all types of trust in the news media have tended to polarize by political party affiliation, with supporters of conservative parties tending to trust the media in general less, and to trust fewer individual media organizations (Stroud and Lee, 2013; Mitchell et al., 2014; Guess, Nyhan, and Reifler, 2017; Ladd and Podkul, 2020; Jurkowitz et al., 2020; Sanders, 2023). This is concerning, because some work finds that mistrust of the news media leads people to choose more ideological sources for news and to resist learning new accurate political information. (Iyengar and Kinder, 1985; Miller and Krosnick, 2000; Druckman, 2001; Tsfati, 2002, 2003; Ladd, 2010b, 2012).

In this paper, we focus on one aspect of this large media trust literature: the causes of distrust in traditional media, and of distrust in social media. Previous work has found that trust in social media tends to be lower than general media trust (Agadjanian et al., 2023). It has also shown that more partisan, less traditional news outlets tend to spread messages attacking the credibility of the mainstream media (Barker, 2002; Jamieson and Cappella, 2008; Ladd, 2012). Those who consume news from ideological sources like partisan magazines, websites, cable channels and talk radio programs are more likely to distrust the mainstream media (Tsfati and Cappella, 2003; Jones, 2004; Ladd, 2012; Tsfati, 2010), a correlation that is almost certainly the result both self-selection and some persuasion from those sources (Ladd and Podkul, 2020). Our experiment allows us to look at one side of the causal path—whether exposure to more social media changes two types of media trust. It is plausible that social media exposes people to more alternative, ideological news sources, which may reduce their trust in the mainstream media and possibly even increase their trust in social media.

⁶This general media trust is often worded as “trust” the “the media” by survey organizations like the American National Election Studies and Gallup, or worded as “confidence” in “the press” by organizations like the General Social Survey, European Social Survey and the World Values Survey. Yet Ladd (2012, ch. 4) finds that responses to prominent different wordings tend to be correlated with each other, and the different wordings tend to prompt similar thoughts in respondents when measured with open-ended follow-up questions.

3 Research Design

We conducted a deprivation design randomized field experiment on a national sample of respondents in France during its 2022 presidential election campaign. France elects its president through a two-round system. The first-round election was held on April 10 and included 12 candidates. Since none of these won a majority of votes, the top two vote recipients — incumbent President Emmanuel Macron and Marine Le Pen— competed in a second-round runoff election on April 24. Emmanuel Macron won that election with 58.5% of the vote. Facebook was the most popular social media platform in France in 2022. Overall, there were nearly 46 million adult Facebook users in France in 2022, which was nearly 70% of its population (Facebook users in France - February 2022; Social Media in France - 2023 Stats & Platform Trends - OOSGA 2023)

In “deprivation design” media field experiments, those in the treatment group are paid to reduce or abstain from using a certain type of media product. In this case, we paid subjects in our treatment groups to deactivate their Facebook accounts during the French presidential election campaign. There are two treatment groups: one group is simply paid to deactivate their accounts, while a second treatment group is paid to deactivate their accounts and also receives informational messages on healthy media use. The informational component of this second treatment group builds on an emerging line of research on interventions aimed at promoting healthier media use. A newer area of media research, which is particularly relevant to the effects of social media use, involves targeted interventions that help people use social media in a healthier manner. This work suggests that, at least in some settings, relatively minimalistic informational messages providing advice on media use can reduce things like misinformation and polarization (Groenendyk and Krupnikov, 2021; Pennycook et al., 2021; Ruggeri et al., 2021). Because these treatments are minimalistic we might want to label them as a type of nudge. They only request that the reader consider the accuracy of information he or she encounters, or to observe norms regarding civility when consuming media. Our study also includes a treatment that tests whether the effects of reduced social media use are enhanced when they are accompanied by these types of informational messages. (see Appendix for the full version of the informational messages)

When we preregistered our study there were, to our knowledge, only two previous studies that used deprivation design field experiments to study the effects of Facebook. [Allcott et al. \(2020\)](#) ran this type of experiment during the 2018 U.S. midterm election campaign. And [Asimovic et al. \(2021\)](#) conducted this type of experiment in Bosnia-Herzegovina during the summer of 2019, a time when the country was not holding an election campaign. In a third deprivation design field experiment examined social media, but not Facebook, [Ventura et al. \(2023\)](#) paid a treatment group to deactivate their WhatsApp accounts during the 2022 Brazilian presidential election campaign.⁷ Since conducting our study, we learned of a large deactivation experiment conducted by a team of scholars in collaboration with Meta during the 2020 U.S. presidential election, from which to our knowledge the results have not publicly been released.

Our study does several things that these other studies did not. Primarily, these other studies focused on different dependent variables. Both [Allcott et al. \(2020\)](#) and [Asimovic et al. \(2021\)](#) found that Facebook tends to reduce happiness but increases people’s levels of political engagement and knowledge. They also tested the effects on polarization, finding divergent results. [Allcott et al. \(2020\)](#) found that Facebook increased affective partisan polarization, while [Asimovic et al. \(2021\)](#) found that Facebook had no effect on ethnic polarization. However, these studies largely did not look at the effects of Facebook on the types of media affects that this paper examines. The only significant overlap is in misinformation acceptance, where they found that Facebook access increases the accuracy of people’s political knowledge. Other than misinformation, the dependent variables we examine in this paper have never been examined before with a Facebook deprivation design field experiment.

4 Methods

4.1 Participants

Prior to the start of the 2022 French national presidential election, we worked with the survey research firm Ipsos to recruit a national sample of French citizens from Ipsos’s existing national

⁷Like Facebook, WhatsApp is owned by Meta, but is a different product.

panel who were eligible to vote and were willing to deactivate their Facebook accounts for 3 weeks during the upcoming presidential campaign (see Figure 1). As noted above, Facebook was the most widely used social media platform in France in 2022. Those respondents who responded to Ipsos’ invitation by saying that they would be willing to deactivate on these terms were then asked if they would be willing to participate in a lottery, where they had a chance of either being in a deactivation study that involved completing two additional surveys (for which they would receive 80 euro) or in a study where they would just take the two additional surveys in return for the regular incentive that Ipsos pays for participating in surveys. 2,246 people agreed to participate under these conditions and 1,117 of these were randomly selected to be in the treatment group who were paid to deactivate their accounts.

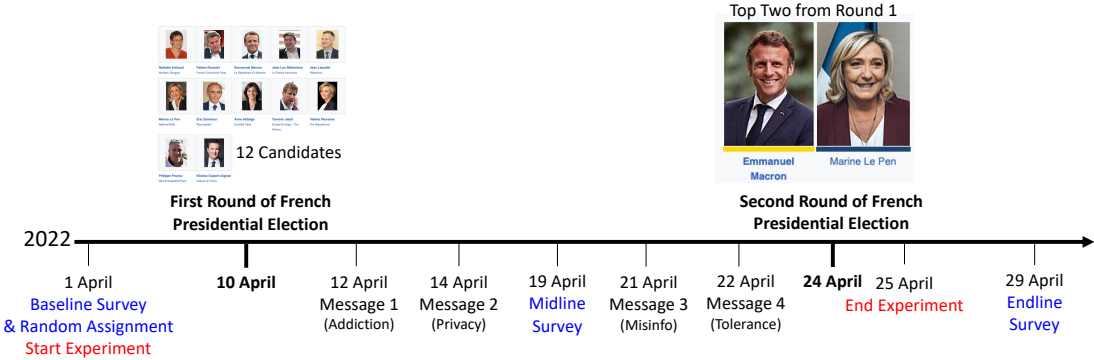


Figure 1: Timeline of the experiment

4.2 Procedures

After completing the baseline survey, participants in the treatment group were informed whether they had been selected to be paid to deactivate their Facebook accounts, as they had previously agreed to. At this time, they were reminded that this deactivation would not delete

their data, that they could reactivate after the study, and that they could continue to use Facebook Messenger during the study. They were paid 80 euro to deactivate, starting 10 days prior to the first-round of the presidential election on April 10 and ending the day after the second-round on April 25, 2022, a little over 3 weeks in total. To monitor compliance, we worked with Ipsos to check the Facebook accounts of participants in the treatment condition daily to ensure that they were deactivated. If any accounts appeared to have been reactivated, Ipsos sent the subjects a message reminding them of their agreement to deactivate their accounts during the study.

Finally, of the 1,117 subjects randomly assigned to deactivation, 547 were assigned to the pure deactivation treatment, and 570 also received four informational messages during the experiment. Of these informational messages, an addiction message was sent on April 12, 2022, a privacy message was sent on April, 14 (both before the midline survey), an accuracy message was sent on 21 April, and a civility message was sent on 22 April (before the second-round election). See the SI for details and wordings of these informational messages.

Thus, our experiment contained three conditions overall. The first was the control condition, where people were not paid to deactivate their Facebook accounts ($n=1,129$). The second was the pure deactivation condition, where people were paid to deactivate their accounts but with no additional interventions ($n=547$). And the third was the deactivation plus informational messages condition, where subjects were paid to deactivate their accounts and also received the three messages described above ($n=570$).

Participants in all conditions were surveyed three times. They were surveyed on April 1 (before the treatment began, what we will call the “baseline” survey), on April 19 (in between the first- and second-round elections, which we will call the “midline” survey), and on April 29 (after the second round runoff election). Participants were paid for their participation after completing all three survey waves. See the Supplemental Information (SI) for descriptive statistics.

5 Outcome Measures

5.1 Agenda Setting

We wanted to test whether the agenda setting power of the mainstream media in France was enhanced or reduced by Facebook use. To do that, we coded the topics of all the front page stories in the three major French newspapers from April 12 to 28, 2023: *Le Monde*, *Le Figaro*, and *Liberation*. These are commonly considered the three papers of record in France. We see this as a good proxy for the news topics that people would consume if they either read these newspapers and their stories directly, or were exposed to news coverage in other newspapers, television programs, radio, podcasts or news websites that cover similar topics because of these major papers' influential role in the news industry.⁸ In other words, this is a measure of the topics getting the most attention by the French mainstream media.

We read through all the front page headlines in these newspapers during this range of days, and after doing so, made a list of the 18 primary topics on these front pages.⁹ We then counted the number of articles on each of these topics on each front page of each edition of these newspapers on each of these 24 days. *Le Monde* had three different editions per day, and *Le Figaro* and *Liberation* had two editions each per day.

Two topics stood out as receiving much more heavy news coverage than all the others. In 22 of the 24 days, the topic of the most news articles on the front pages of each of the editions of each of these newspapers was either the war in Ukraine or the presidential election contest itself. The only exceptions to this were on April 27, when one edition of each of the three papers covered Elon Musk's acquisition of Twitter in the most front page stories (yet even on this day, each paper had an edition that focused most on one of the aforementioned top two stories), and on

⁸On the concept of an institutional media, which has higher prestige than other media and thus influence over the topics covered by less prestigious news outlets, see [Gans \(2004\)](#); [Cook \(1998\)](#); [Schudson \(2002\)](#); [Ladd \(2012\)](#); [Dunaway and Graber \(2022\)](#)

⁹These topics were: Delinquency, Pensions, Health system, Environment, Purchasing power, Immigration, Social inequalities, Terrorism, Unemployment, School system, Covid-19, Public deficits and debt, the presidential election contest itself (which includes the organization of political life and the functioning of democracy), the distribution of competences between the State and the territories, the defense of the Republic and secularism, Discrimination, The European questions, and the war in Ukraine.

April 28, when one edition of *Le Monde* focused most on Covid-19 and an edition of *Le Figaro* focused most on Hungary’s admittance to the EU. We come to the same conclusion (that the war in Ukraine and the presidential election were by far the most covered on the front pages of these papers) even if we aggregate in different ways, such as grouping all stories in each newspaper on each day together (combining all editions) or grouping all front page stories in all editions and all newspapers together in one count. All these approaches find that these two topics were covered much more frequently than any others during the study period.

To measure the agenda setting power of the institutional media, we measured differences between the treatment and control groups in whether they named one of these two topics as their top policy concern in a survey question. In the question, we provided a long list of topics, and asked “Please select your top 3-5 policy concerns from the following and rank them from first (most important) to fifth (least important).” The dependent variable is a dummy variable indicating whether people placed either the Ukraine War or the presidential election as their top policy concern.

5.2 Echo Chambers

We measure whether people are in online echo chambers by combining two survey questions. The first asks “How often do you come across information on the Internet that you disagree with?” People were given a 0-to-10 scale with 0 labeled “never” and 10 labeled “very often.” The second question asks “Do you consider that you found diversified political information in your online interactions?” with respondents offered another 0-to-10 scale labeled “Not diversified” at 0 and “Very diversified” at 10. Below, we analyze the effects of the treatments on responses to each question separately.

5.3 Media Trust

We measure trust in both traditional media and in social media, and examine the treatment effects on each separately. These questions appear in a question battery that asks about trust

in a variety of parts of the political system. We ask respondents: “In general, do you totally, somewhat, somewhat not, or not at all trust...” and then have a list of concepts for them to rate, which includes the current president of France, political parties in general, elected legislators in general, and “traditional media (television, radio, written press)” and “social networks.” Our analysis here focuses on respondents ratings of the last two on the trust scale provided in the question.

All of the survey questions measuring our dependent variables in this paper were asked in both the midline and the endline surveys. Below, we report the results from both. This enables us to examine whether any effects took either two or four weeks to materialize, or whether any effects present at two weeks went away by the fourth week.

5.4 Variables Used to Estimate Heterogeneous Treatment Effects

For all of our main preregistered hypotheses, we also preregistered some predictions about heterogeneous treatment effects. These focused on variables that the existing literature has found to moderate various types of media affects on the mass public. We measured respondents’ level of education and their age. People with higher levels of education tend to seek out more political information in general and especially more political information that agrees with their political predispositions (Zaller, 1992). Older people are more likely to have stronger party identification and overall political ideology (Achen, 1992; Markus, 1979; Franklin and Jackson, 1983). Also, the audience for Facebook has tended to be older than average in recent years, but that difference may be offset by the fact that our study only includes people who were existing Facebook users who agreed to deactivate their accounts for payment (which holds prior Facebook usage more constant than it would be in a completely representative sample of the public).

Finally, we also expected that some of the effects may vary depending on people’s propensity to second guess their intuitions, known as cognitive reflection (Toplak, West, and Stanovich, 2011). Consistent with prior work on cognitive reflection (Arceneaux and Wielen, 2017; Pennycook and Rand, 2019), we expect that it could increase the positive effects of deactivating Facebook and

the additional effects of the informational treatments, because these people are more introspective about how they engage with political information and more receptive to advice about how to do that. We measured cognitive reflection using a standard three-item Cognitive Reflection Task developed by [Frederick \(2005\)](#) and [Thomson and Oppenheimer \(2016\)](#).

The analysis for the Heterogeneous Treatment Effects is still underway. We included our hypotheses about the moderators in the next section, and the preliminary moderation analysis results in the supplementary analysis. Please see Appendix for the regression outputs. We apologize for the inconvenience at the moment.

6 Preregistered Hypotheses

We preregistered our hypotheses regarding both average treatment effects and interactions producing heterogeneous treatment effects prior to receiving the data (See: <https://osf.io/xt5zg/>).

6.1 Agenda Setting

We expected that social media use would dilute the effects of agenda setting messages from the institutional media, by distracting people from news altogether and/or by turning people’s attention to other topics than those most covered in the mainstream media. Thus, our preregistered hypothesis was the following:

H1: People in the deactivating Facebook group will experience more media agenda setting. Thus, they will be more likely to provide answers to the “top policy concern” question that are consistent with the most frequent topics in the mainstream press.

However, we expected that this effect of deactivation would be smaller when people receive the informational treatments, because the those treatments would reduce the persuasive effects of conventional media coverage:

H1a: People in the deactivating Facebook and information treatment group will be less effected by the additional agenda setting than those in the deactivating Facebook only condition.

We also expected that the effect of Facebook deactivation on agenda setting would be larger among those who are typically more effected by agenda setting from the institutional media. People with higher levels of education and who are older are more likely to consume institutional media and psychologically process it's messages. Thus, we also preregistered the following predictions for heterogeneous treatment effects:

H1b: The positive effects of Facebook deactivation on media agenda setting will be larger in magnitude among those with higher education levels.

H1c: The positive effects of Facebook deactivation on media agenda setting will be larger in magnitude among those who are older.

6.2 Echo Chambers

It is plausible that social media use could either increase the prevalence of online ideological echo chambers or have the opposite effect. You must start by considering the baseline (people's media consumption patterns if they don't use social media). As noted above, the cable and internet environment allows for substantial media choice, including the political slant of the news you consume ([Guess, 2021](#); [Brookman and Kalla, 2023](#)) and whether to consume political news at all ([Prior, 2007](#)). The best existing research finds echo chamber media consumption patterns in internet usage among a small subset of the population ([Guess, 2021](#)) and in cable news usage for a larger portion of the public ([Brookman and Kalla, 2023](#)). Social media could possibly enhance people's ability to self-select online sources that provide information that they agree with (see [Sunstein, 2018](#); [Nyhan et al., 2023](#)). On the other hand, because people "friend" or otherwise follow accounts on Facebook for many reasons other than politics, people's ability and motivation to politically self-select Facebook content may be less than in other media contexts. On top of this, platforms may promote posts based on algorithms that aim to maximize engagement and psychological arousal, leading them to show users content from their followers that is more likely to agitate them (see [Anspach, 2016](#); [Bail, 2022](#); [Settle, 2018](#); [Rathje, Van Bavel, and Van Der Linden,](#)

2021).¹⁰ Our expectation is consistent with this: While people’s Facebook connections are more homogeneous than a random sample of the public (Nyhan et al., 2023), they are less politically self-selected than the media sources people choose outside of social media. We hypothesized that:

H2: Facebook deactivation will increase the prevalence of online ideological echo chambers, using both measures of online echo chambers included in our surveys.

Because our minimalist information treatments encouraged people to seek out diverse types of information and media sources, we expected that the information treatments will reduce the effects of Facebook deactivation on online echo chambers. We hypothesized that:

H2a: Facebook deactivation plus minimalist informational treatments will increase the prevalence of online ideological echo chambers relative to the control group less than the Facebook deactivation only treatment does.

We also expected some heterogeneity in this effect. We expected that those with more education would be more likely to seek out ideological echo chambers. However those higher in cognitive reflection will be more able to avoid ideological echo chambers when they are off of Facebook, especially when they are given the minimal informational treatments. We hypothesized that:

H2b: The positive effect of Facebook deactivation on being in an online ideological echo chamber will be greater among those higher in education.

H2c: The positive effect of Facebook deactivation on being in an online ideological echo chamber will be lower among those higher in cognitive reflection.

6.3 Media Trust

Since more partisan types of media tend to criticize the establishment media, and deactivating Facebook might reduce subjects overall exposure to partisan media and increase their exposure to mainstream media sources, we hypothesized that:

¹⁰However see Levy (2021).

H3: Facebook deactivation will increase trust in the traditional media and decrease trust in social media.

We also expect that the minimalist informational treatments will lead people to have a more balanced media experience when they quite Facebook, somewhat reducing their exposure to partisan sources that criticize the mainstream media even outside of social media. Thus, we hypothesized that:

H3a: Informational treatments will increase the magnitude of the effects of Facebook deactivation on both types of media trust.

We preregistered one interaction with the media trust effect. The literature suggests that people with higher levels of education are more receptive to partisan messages criticizing the mainstream media (Ladd, 2012). Because the presence or absence of media criticism has larger effects on those with more education, we hypothesized that:

H3b: The effect of the Facebook deactivation on trust in the mainstream media will be larger among those with higher levels of education.

H3c: The effect of the Facebook deactivation on trust in the mainstream media will be larger among those who are older.

7 Results

7.1 Manipulation Check

As a manipulation check, Figure 2 shows the effect of treatment assignment on self-reported Facebook use on the midline and endline surveys. Participants were asked “How often do you currently check your Facebook feed?”¹¹ The treatments reduced Facebook use considerably in the midline wave (treatment – control = -1.1 for both treatment arms, $p < 0.01$) and endline

¹¹The response options were: 0 times per week, once per week, once per day, more than once per day, and more than 10 times a day.

waves (Deactivation Only – Control = 0.78; Deactivation + Information – Control = 0.73, $p < 0.01$). On the midline survey, 37.7% of the Deactivation Only group and 35% of the Deactivation + Information group reported not checking their Facebook feed at all as required by the experimental protocol, compared to just 0.01% of the control group.

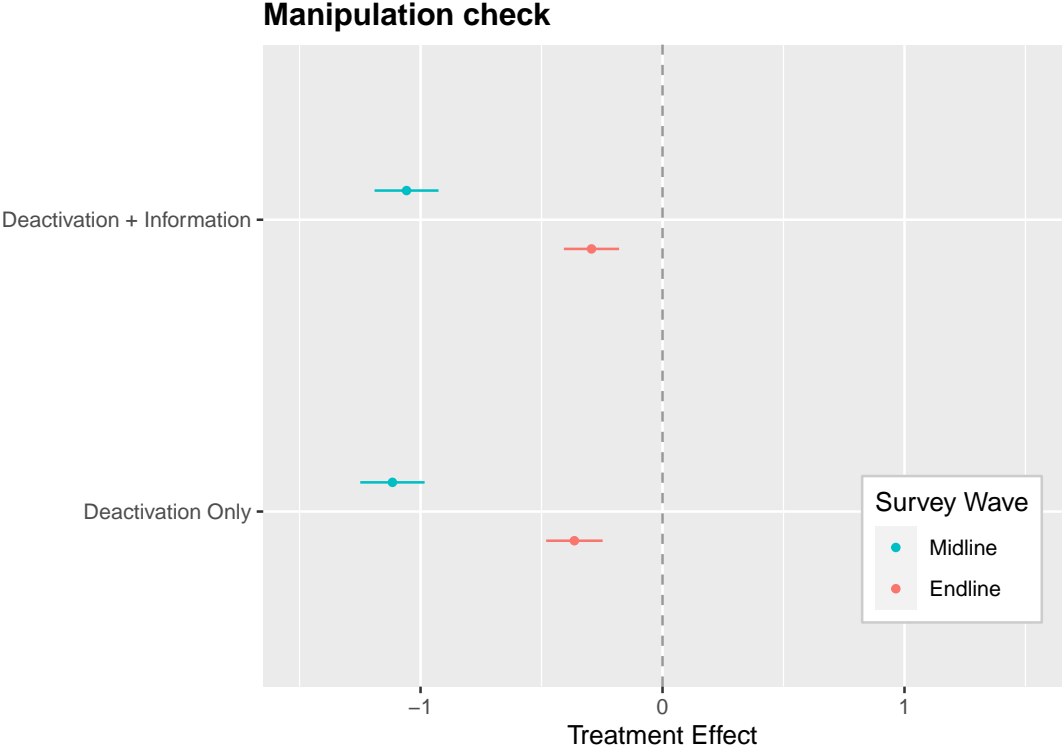


Figure 2: Manipulation Check: Effect of Treatment Condition on Facebook Use

Yet obviously this is incomplete compliance. Given that Ipsos checked that the treatment group participants’ Facebook accounts were deactivated, we are not sure why some subjects continued reporting Facebook use. One possibility is that they interpreted the question as asking about their general behavior in the past, including before the experiment started. Another possibility is that some participants found a way around the experimental protocol. A possible explanation for the endline survey results (which show less compliance than the midline) is that the endline survey was conducted five days after they experiment ended, and a substantial portion of the control group may have reactivated their Facebook accounts as soon as the experiment ended,

and reported on that new use in the endline survey.¹² Still, even in the midline survey, compliance is better but not complete.

Whatever the explanation, incomplete compliance does not destroy the internal validity of the experiment. Almost all field experiments contend with the issue of noncompliance (e.g., [Gerber and Green, 2000](#); [Green and Gerber, 2015](#)). In many ways, this is a feature and not a bug of these experiments, as it allows researchers to evaluate the effects of real-world treatments where people have agency over their behavior. We report intent-to-treat effects that compare the behavior of the subjects according to their randomly assigned groups, irrespective of their compliance with the experimental protocol. These intent-to-treat effects are unbiased in the presence of some noncompliance. Overall, there was substantial but incomplete compliance with the Facebook deactivation treatments, allowing us to estimate unbiased intent-to-treat effects.

7.2 Agenda Setting

H1 hypothesized that those who deactivated Facebook would be more affected by mainstream media agenda setting. Figure 3 shows that we actually found the opposite. Contrary to our hypotheses, those in both of the two Facebook deactivation conditions were *less* likely than the control group to name one of the top two topics in the mainstream media as the most important story in the country. At the end of the study, in the endline survey, 28% of those in the control condition named one of the most covered topics as the most important story, compared with 33.7% in the deactivation + informational message group, and 35.1% in the deactivation only group. Both of these treatment effects are statistically significant at < 0.02 . The effects of both treatment conditions are in the same direction but smaller and not significant at conventional levels half-way through in the midline survey. Deactivating Facebook reduced the power of media agenda-setting.

¹²In the endline survey, 20% of treatment group participants reported that they had opted to continue to forgo using Facebook in the future. Of those who reported on the midline survey that they were not currently checking their Facebook feed, 33.3% in the Deactivation Only group and 35.3% in the Deactivation + Information group reported returning to pre-study levels of Facebook use. Of those, who reported that they quit using Facebook during the study (i.e., they fully complied with the treatment), 58.9% of the Deactivation Only group and 61.2% of Deactivation + Information.

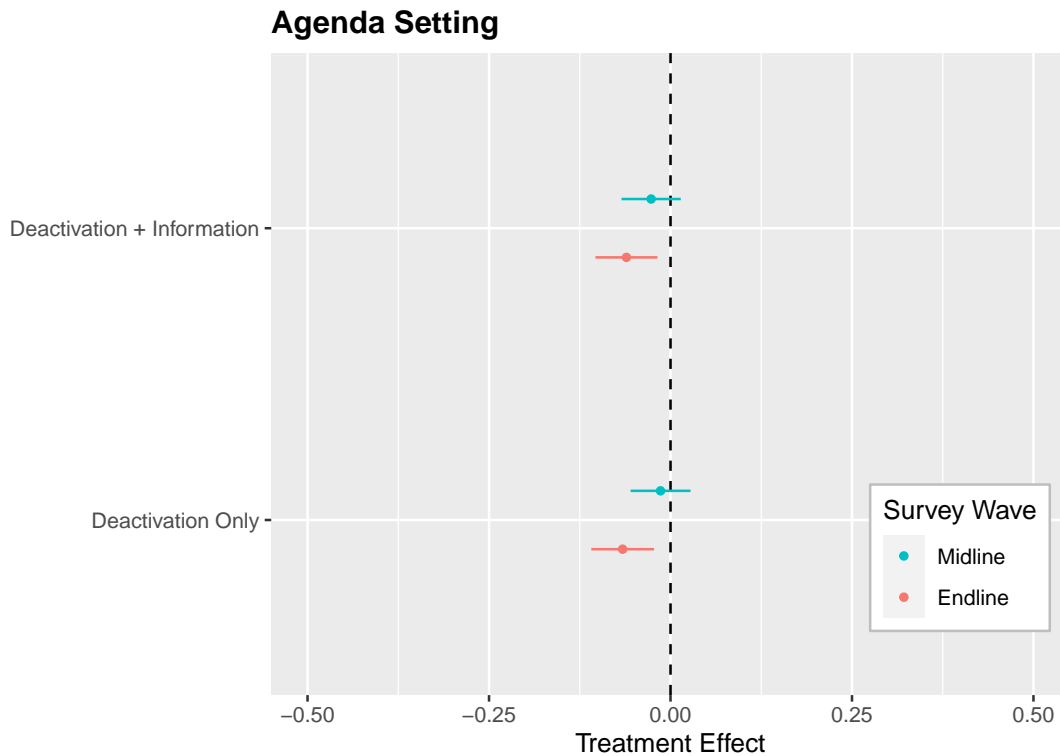


Figure 3: Agenda Setting

Note: Figure shows the treatment effects relative to the control condition. The dependent variable is a summary variable indicating whether the subjects placed one of the top two most covered topics in the media as their top policy concern.

Given that the effect of deactivation is the opposite of our preregistered hypothesis H1, our H1a predicting that the effect will be smaller among those who also get the informational treatments is not directly applicable. But nevertheless, our results do indicate that the reduction in agenda setting when subjects cancelled Facebook is smaller in magnitude among those who also received the informational treatments, but the difference is not large or statistically significant.

7.3 Echo Chambers

H2 predicts that deactivating Facebook will increase the prevalence of online ideological echo chambers, measured by whether people encounter political information they disagree with online and whether they find diversified political information in their online interactions. Furthermore, hypothesis H2a predicts that this effect will be smaller when people are given the information treatments encouraging healthy media use. Figure 4 looks at the first dependent variable—whether

people find diverse information online—and it finds some evidence in favor of H1, but evidence that contradicts H2. This variable is coded so that higher numbers (in a 0-10 scaled) indicate that you “very often” “come across information on the Internet that you disagree with,” while lower numbers indicate that you “never” do. Thus, it is lower scores that indicate that you are in an echo chamber.

The evidence that deactivation increases online ideological echo chambers is inconclusive in the midline survey. The effects are negative (consistent with H1) but not statistically significant. Yet in the endline survey, when the study was complete, there is some evidence that contradicts H1: deactivating Facebook decreased online echo chambers, but the effect was only present among those who also received the informational treatment. This group moved about 0.3 on a 0-10 scale toward seeing more political information online that they disagreed with. The effect was very small and not statistically significant among those who were paid to deactivate but did not receive the informational treatment. Our H2b had predicted that the information treatments would reduce people’s susceptibility to online echo chambers by reducing the echo chamber-inducing effects of leaving Facebook. It turned out the leaving Facebook did not increase echo chambers by this measure, but that quitting Facebook and getting the informational treatment actually reduced echo chambers by this measure. Here, the informational treatments did reduce unhealthy media environments (consistent with the spirit of H2b), but it did it in a different way because the results contradicted H2.

Turning to the other measure of online ideological echo chambers, encountering diverse political information (which was asked only in the endline survey), the results presented in Figure 5 *are* consistent with H2. This variable is coded, so that higher numbers (in a 0-10 scaled) indicate that the “political information in your interactions online lately” is “very diversified” while lower numbers indicate that it is “not diversified.” This, again lower scores indicate that you are more in an echo chamber.

Those who deactivated Facebook were significantly less likely to report encountering diverse political information. And contrary to H2a, this happened regardless of whether one received informational treatments. The effect is slightly smaller in magnitude and drops slightly below

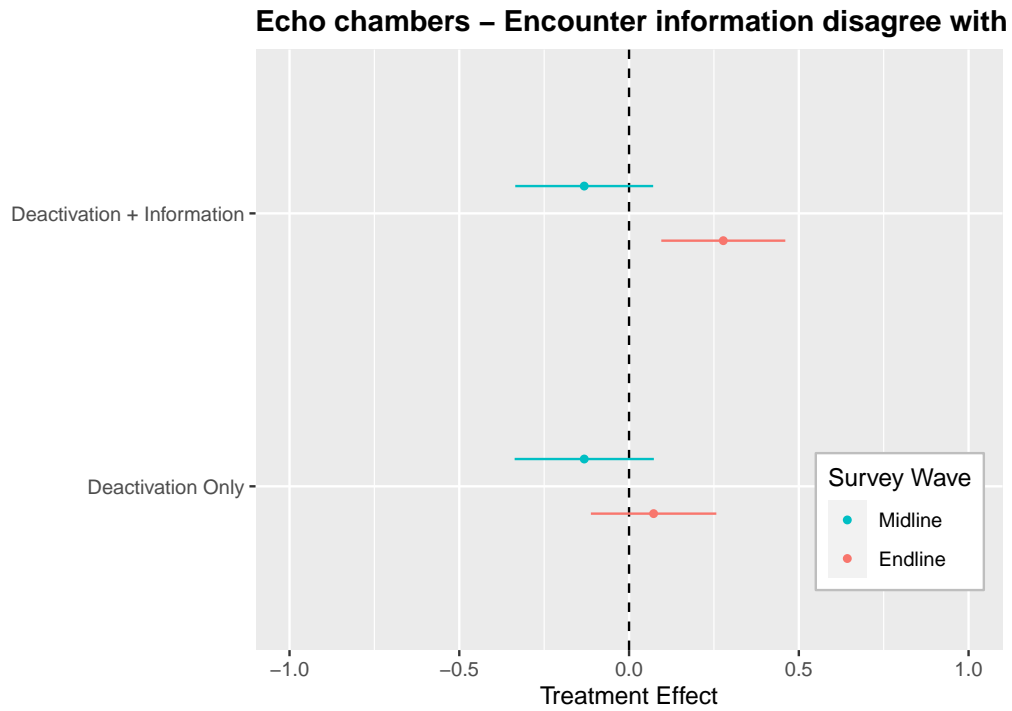


Figure 4: Echo Chambers: Encountered information disagree with

Note: Figure shows the treatment effects relative to the control condition. The dependent variable is the frequency with which the subject reported coming across information on the internet that they disagreed with.

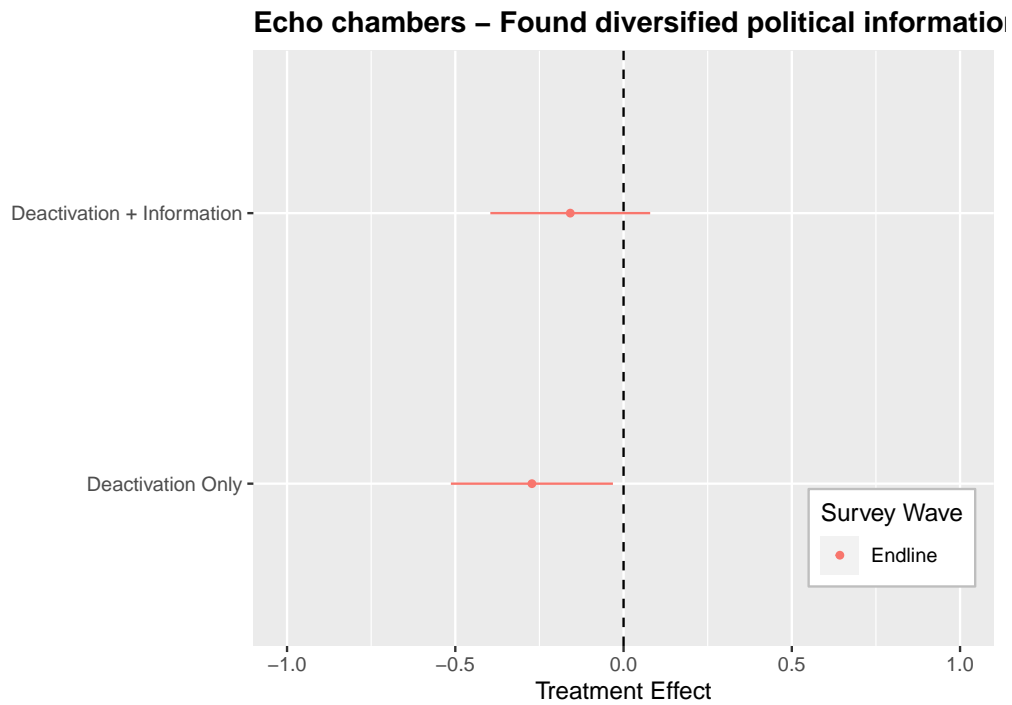


Figure 5: Echo Chambers: Found diversified political information

Note: Figure shows the treatment effects relative to the control condition. The dependent variable is the frequency with which the subject reported coming across information on the internet that they disagreed with.

conventional levels of statistical significance when you look at the deactivation + information treatment condition, but the difference between these two treatment effects is not significant and trivially small in magnitude. Deactivating Facebook makes one less likely to encounter ideologically diverse political information online (consistent with H1), but the informational treatments appear to have no affect (inconsistent with H2). Overall, we encountered divergent results: The first contradicts our expectations, yet the second confirms them. We could speculate that subjects interpreted the questions about diverse political information and information that you disagree with differently.

7.4 Media Trust

H3 predicts that those who deactivate Facebook will have higher trust in “traditional media” and lower trust in “social networks,” and H3a predicts that these effects will be larger among those who receive the information treatments (because they will use less partisan media when they quit Facebook). The results are shown in Figure 6. Both dependent variables were asked in the endline survey, but not the midline survey.¹³ For both variables, lower values (on a 1-4 scale) indicate more trust (with “complete trust” being 1) and higher values indicate less trust. The results are inconsistent with both H3 and H3a. Deactivating Facebook has no detectable effect on trust in the traditional media, whether or not one also received the informational treatments.

The results are also inconsistent with H3’s expectations about trust in social media. Deactivation does not reduce trust in social media. If anything, in this study there was a light (but statistically insignificant) increase in trust in social media when people deactivated Facebook. Those in the deactivation-only condition were .045 higher in social media trust, although this difference was not statistically significant ($t=1.45$, $p<0.15$). Contrary to H1a, the information treatment does not increase the magnitude of this effect. Those in the deactivation + information condition have essentially the same level of trust in social media as the control group. One possible explanation, which we did not anticipate, is that both being on social media and the informational

¹³They were both also measured in the baseline survey before the study started. The figure shows results controlling for respondents’ baseline values on the variable, but the results are unchanged if this control is removed

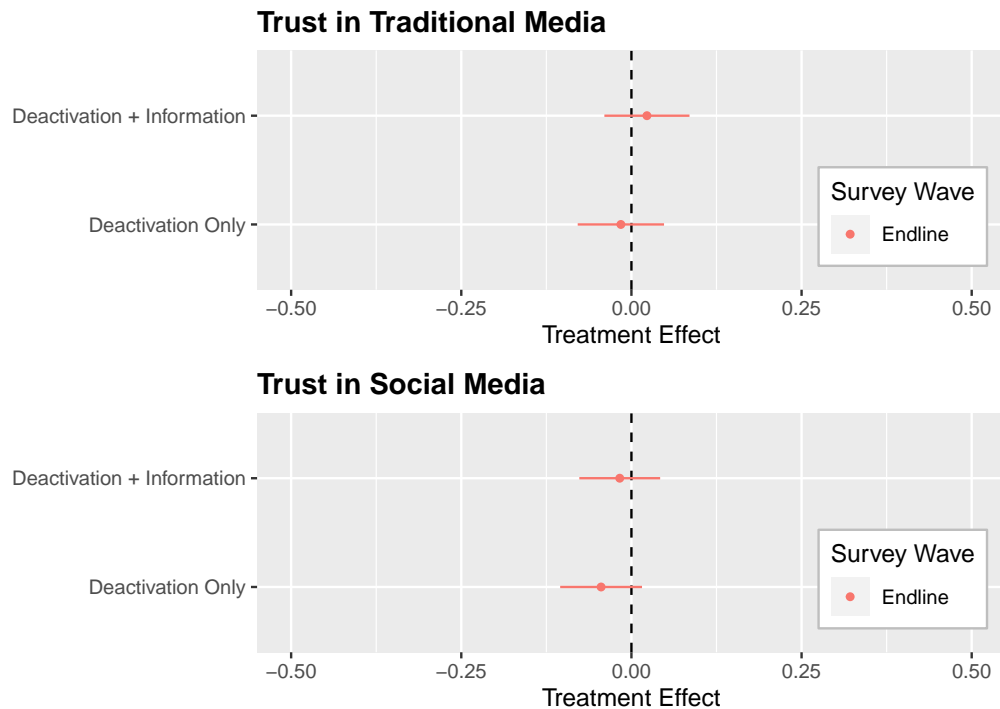


Figure 6: Trust in traditional and social media

Note: Figure shows the treatment effects relative to the control condition. In the top portion of the figure, the dependent variable in the top panel is how much the subject trusts traditional media while the dependent variable in the bottom panel is how much the respondent trusts social media

treatments remind people about social media’s problems. When people use Facebook, they might observe problems on the platform as well as read posts from other people on the platform complaining about it. When people simply stop (or at least reduce) their Facebook use, they may start to forget about these problems. But the informational treatments may remind these people who have stopped using Facebook about all of the problems (or at least potential problems) of social media use. Yet this should be interpreted as speculation, because we did not predict it in advance.

In summary, Facebook deactivation had neither a detectable effect on trust in traditional media, nor on trust in social media. We have some indication that deactivation may increase trust in social media, but this was contrary to our preregistered hypotheses and is not statistically significant at conventional levels.

8 Additional Evidence on Social Media Effects on (Mis)information Reception

A fourth major focus of media effects research has been on the spread of inaccurate information. This is not a primary focus of this paper, because we have reported the effects on reception of accurate and inaccurate information in this study in another paper [Arceneaux et al. \(2023\)](#), but given their relevance, we briefly summarize them here. The notion that the success of a democracy depends on the news media giving the public an accurate picture of the world goes back at least to Lippmann's early twentieth century writings ([Lippmann, 1995, 1997](#); [Schudson, 1978](#); [Streckfuss, 1990](#)). If anything, studying the prevalence of misinformation in streams of political communication, and learning how to reduce its spread, has become an even heavier focus of political communication research in the past ten years, much of it specifically focused on misinformation spread on social media ([Bode and Vraga, 2015](#); [Bode, Vraga, and Tully, 2021](#); [Nyhan and Reifler, 2015](#); [Graves, Nyhan, and Reifler, 2016](#); [Flynn, Nyhan, and Reifler, 2017](#); [Vraga and Bode, 2020, 2022](#); [Bode and Vraga, Bode and Vraga](#)).

How might the spread of accurate and inaccurate information change in the social media era? It could be that social media use leads people to encounter more political information (both accurate and inaccurate) than they did in the cable and internet high choice media era. People who are relatively uninterested in politics usually avoid political content when choosing which channels to watch or web pages to read (see [Prior, 2007](#)). Yet these people may unintentionally encounter accurate or inaccurate political information in their social media feeds (e.g. [Settle, 2018](#)) that they do not have the political sophistication to know when to reject (e.g., [Zaller, 1992](#)). By causing more people to unintentionally encounter political information, social media may reduce the polarization in information levels created by the cable and internet high choice era ([Prior, 2007](#)).

Our study, and two previous Facebook deprivation design field experiments, test acceptance of accurate and inaccurate information by giving subjects a series of real and fake news headlines, and asking them to identify which are real news stories. In [Arceneaux et al. \(2023\)](#), we report that, in the present study, by the end of the three weeks, Facebook deactivation reduced subjects

knowledge of accurate political news stories, but had no detectable effect on their acceptance of false stories. The informational treatments somewhat reduced the size of the information loss when people deactivated. This is similar to the findings in two previous Facebook deprivation design experiments that tested the effects on reception of accurate news and misinformation. [Allcott et al. \(2020\)](#) and [Asimovic et al. \(2021\)](#) both found that deactivating Facebook reduced political knowledge.

9 Discussion and Conclusion

This paper reports results from a deprivation design field experiment on social media use conducted in April 2022 during the French presidential campaign. It specifically tries to find out if social media use disrupts important phenomena in the political media system, particularly those that have been previously documented in the academic literature. We examine: agenda setting, online ideological echo chambers, declining media trust, as well as reception of real news stories and misinformation. Social media use has become so widespread that it is important for researchers to better understand the consequences of it for how people interact with the media system overall. This paper tries to do build that understanding.

While some of the findings are complex, taken together, they do tell a story about the how people use the overall media system with and without social media. First, contrary to our expectations, we find that Facebook use increases the power of mainstream media agenda setting. Second, consistent with our expectations, with one of our measures, we find that Facebook use decreases how much people live in online ideological echo chambers. We find this when we measure echo chambers by asking if the “political information in your interactions online” are “diversified.” We don’t find any effect using a question asking if you “come across information on the Internet that you disagree with.” Third, contrary to our expectations, we find that Facebook use has no detectable effect on trust in traditional media or trust in social media. This suggests that social media does not play a detectable role in the continuing long-term decline of trust in the media. Finally, we can consider these findings alongside results from this same experiment that we

previously reported in [Arceneaux et al. \(2023\)](#). As reported there, we found that Facebook use *increases* political knowledge of recent news stories, and has no detectable effect on misinformation acceptance.

Overall, our results indicate that, contrary to some conventional wisdom, social media use does not substantially disrupt the patterns by which people in advanced democracies have interacted with the media system for decades. The mainstream media still plays an agenda setting role when people use social media. In fact, we find that role to be enhanced by social media use. Social media doesn't lead people to live more in online ideological echo chambers. In fact, by one of our measures, we find that social media reduces the prevalence of these echo chambers. Social media neither appears to contribute to the long-term decline in trust in traditional media nor have any influence on trust in social media. And social media doesn't increase the spread of political misinformation. Social media use actually increases people's ability to recall real campaign news stories, and has no effect on belief in false stories.

If anything, social media changes how people relate to the overall media system by undoing some trends that were encouraged by the cable and internet high choice era. In an influential article, [Bennett and Iyengar \(2008\)](#) argued that the high choice media era reduced the power of major media effects on public opinion that characterized the broadcast era. It did this by allowing people more power to choose to consume media content that they already agreed with. We find that, rather than furthering that trend, social media stops or even reverses it. Facebook appears to increase mainstream media agenda setting and (although this conclusion is more tentative) reduce online ideological echo chambers. Trust in the mainstream media, which had been declining slowly but steadily since the early 1970s, starting declining at a faster rate in the high choice era in the late 1990s and 2000s ([Ladd and Podkul, 2020](#); [Guess, Nyhan, and Reifler, 2017](#)), a time when partisan cable, talk radio and web content heavily criticised the mainstream media ([Ladd, 2012](#); [Barker, 2002](#); [Jamieson and Cappella, 2008](#)).¹⁴ We find that social media does not exacerbate this trend. Taken together, these results accentuate the differences between the social media era and the cable and internet high choice media era. The social media era may not continue the trends

¹⁴This trend was larger among Republicans ([Ladd and Podkul, 2020](#); [Guess, Nyhan, and Reifler, 2017](#)).

of its predecessor and instead may at least partially reverse them.

Finally, these results should raise skepticism about the power of relatively noninvasive informational messages to change media behavior. In contrast to past work that sometimes found these treatments helpful, we very rarely found that they made any difference, at least in the effects studied here. The only notable exception is the effect of deactivation on one of the measures of online echo chambers: whether people reported seeing “information on the internet you disagree with.” Unlike our other measure of online echo chambers, here deactivation alone has no significant effect. But when deactivation is combined with the information treatment, reported online echo chambers decline, the opposite effect as what we find with the other online echo chamber measure. This could be because when people no longer have Facebook, the information is successfully encouraging them to diversify their media diets, but clearly more study is needed because the information made no difference with the other measure of online echo chambers.

Taken together, our results should raise some skepticism about the idea that social media (or informational treatments about media use) can or will transform how people learn about the political world through the media. We find the effects of social media use on several major types ways people interact with the media system to be small, and when they do occur they reinforce phenomena (like agenda setting) that originated at least as far back as the broadcast era.

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Appendix

A1 Questionnaire

As explained in the main section, the experiment consists of three surveys: baseline, midline, endline. The entire questionnaire can be found in the following pre-registration link:

<https://osf.io/xt5zg/files/gc4ta>

A2 Informational messages

We presented participants with the informational treatments shown below if they were assigned to the Deactivation + Information condition. The messages were intentionally kept short, simple, and highly legible, similar to those used in the existing literature.

Nudge n°1 – “Resisting the addictive power of digital platforms” (Delivered 12 April 2022)

How much of your life is absorbed by screens?

According to a scientific study, beyond 30 minutes of exposure to social networks, there is a danger for our mental health (1). More generally, a correlation can be established between the time spent on digital platforms and a decrease in well-being (2).

The risks for mental health are numerous and proven: anxiety, negative self-image, depression, paranoia, among others.

Disconnecting from screens, resisting information overload, means taking back control of your life, your attention, your emotional balance.

3 things you could do:

- Suppress the applications from your mobile phone so that you are not tempted to use them.
- Engage in offline activities and discussions with real people.
- Read offline news media (newspapers, journals and magazines).

(1) Source: Hunt, M. G., Marx, R., Lipson, C., Young, J. (2018). “No more FOMO: Limiting Social Media Decreases Loneliness and Depression”, *Journal of Social and Clinical Psychology*, 37(10), pp. 751-768.

(2) Source: Courbet, Didier, et al. (2020) “Addictions” et comportements problématiques liés à Internet et aux réseaux sociaux. Synthèse critique des recherches et nouvelles perspectives. *ESSACHESS*, 13(1), 209–35.

Nudge n°2 – “Preservation of privacy and access to diversified information” (Delivered 14 April 2022)

Your privacy is exploited and your access to the world is limited.

As soon as you connect to the Internet, your personal data is collected and used for advertising purposes: you are a source of revenue.

This collection of your personal data also allows digital interfaces (social networks, search engines, sites) to offer you targeted content based on your presumed tastes.

The consequences:

- You will never know how much information is being retrieved about you and your activity.
- You will never have access to the world’s information like your neighbor.

The risks:

- You have no real control over your personal data.
- You may find yourself ”imprisoned” in a distorted vision of the world, or even indoctrinated with your own beliefs (1). This is detrimental to democratic debate and can lead you to a disconnected perception of the real world’s diversity and priorities.

3 things you could do:

- Try to navigate in ”private mode” and to regularly erase your browser’s search history.
- If you would like to see how your information is collected and shared by online platforms, you can use this software created by the CNIL for information purposes: <https://linc.cnil.fr/fr/cookieviz-une-dataviz-en-temps-reel-du-tracking-de-votre-navigation>
- You can download an information brochure about the General Data Protection Regulation (GDPR): <https://www.droit-technologie.org/wp-content/uploads/2016/11/annexes/dossier/274-1.pdf>

(1) Source: Pariser, Eli (2011). ‘The Filter Bubble, What the Internet Is Hiding From You’. New York: Penguin Press.

Nudge n°3 – “Checking sources to fight misinformation” (Delivered 21 April 2022)

Misinformation only exists if we don't know where the information comes from.

On the Internet, information circulates very quickly, often before we even know where it comes from. Information is sometimes relayed without any knowledge of its origin or veracity, and real information stands next to false information in an often undetectable way.

False information or “fake news” is promoted either with a bad intention, an interest (political, economic), or simply to take advantage of the online visibility and the revenues they generate. In all cases, the victim is you.

Misinformation has a major impact on political life and threatens democratic debate: it can cause political polarization (1), serve hidden interests and deprive you of the right to have an objective perception of the issues. Misinformation can lead you to have a distorted perception of political agendas and a distorted view of political debates.

3 things you could do:

- Always check who is/are the author(s) or the owner(s) of the website and the type of platform.
- Cross-check the information with other media platforms, other views and try to find scientific sources on the topic.
- Before you share any content, try to identify: who made it; what is the source; where did it come from; why are you sharing this; when was it published?

(1) Source: Doublet, Yves-Marie (2019). Désinformation et Campagnes électorales. Namur : Council of Europe.

**Nudge n°4 – “Adopt civic behavior for a free and qualitative democratic debate”
(Delivered 22 April 2022)**

Civility and tolerance for a better democratic debate.

Online content (messages, news feeds, blog posts, articles, etc.) can trigger extreme emotional reactions.

Freedom of expression should never lead to harassment.

Freedom of expression should never lead to hate speech.

A free and quality democratic debate implies being able to accept different opinions, without locking oneself into a position that excludes others. Studies have shown that media platforms (such as YouTube) drive audiences towards politically extreme content (1).

3 things you could do:

- Restrain from any emotional comments on the Internet.
- When you disagree with a view or consider it inaccurate, do not enter into a confrontation.
- Do online research to avoid viewing the content that is suggested by media platforms (like YouTube).

(1) Source: Ribeiro, M. H., Ottoni, R., West, R., Almeida, V. A. F., and Meira, W. (2020). ‘Auditing radicalization pathways on YouTube’. In Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency (FAT ’20). Association for Computing Machinery, New York, NY, USA, 131–141.

A3 Descriptive Statistics

Table A1: Sample accounting: baseline, end-line, and attrition by condition

Condition	Full N	End-line N	Attrition (N)	Attrition (pc)
Control	1242	1051	191	15.4%
Allsides / News Encouragement	1243	1058	185	14.9%
FB Deactivation	1244	1073	171	13.7%
FB Deactivation + Allsides	1242	1096	146	11.8%
Overall	4971	4278	693	13.9%

Table A2: Descriptive Statistics by Survey Wave

Variable	Wave A	Wave B	Wave C
N	2246	1955	2246
Age	46.57 (13.58)	46.85 (13.48)	46.57 (13.58)
Female	0.66 (0.47)	0.66 (0.47)	0.66 (0.47)
Ideology	5.48 (2.55)	5.47 (2.54)	5.48 (2.55)
Education	4.79 (1.36)	4.78 (1.35)	4.79 (1.36)
Rural / Urban	4.28 (3.04)	4.28 (3.04)	4.28 (3.04)
Household size	2.79 (1.28)	2.78 (1.28)	2.79 (1.28)
Facebook use (reversed)	3.07 (0.77)	2.52 (1.39)	2.72 (1.18)

Attrition table

A4 Hypotheses

Table A3: Hypotheses and the results

Category	Measure	Hypothesis	Result
<u>A. Agenda Setting</u>			
H1	whether top three concern match the main two topics in the newspapers	People in the deactivating Facebook group will experience more media agenda setting. Thus, they will be more likely to provide answers to the “top policy concern” question that are consistent with the most frequent topics in the mainstream press	Opposite
H1a	whether top three concern match the main two topics in the newspapers	People in the deactivating Facebook and information treatment group will be less effected by the additional agenda setting than those in the deactivating Facebook only condition	
H1b	education level (moderator)	The positive effects of Facebook deactivation on media agenda setting will be larger in magnitude among those with higher education levels	
H1c	age (moderator)	The positive effects of Facebook deactivation on media agenda setting will be larger in magnitude among those who are older	
<u>B. Echo Chambers</u>			
H2		Facebook deactivation will increase the prevalence of online ideological echo chambers, using both measures of online echo chambers included in our surveys	
H2a		Facebook deactivation plus minimalist informational treatments will increase the prevalence of online ideological echo chambers relative to the control group less than the Facebook deactivation only treatment does	
H2b	education level (moderator)	The positive effect of Facebook deactivation on being in an online ideological echo chamber will be greater among those higher in education	

H2c age (moderator) The positive effect of Facebook deactivation on being in an online ideological echo chamber will be lower among those higher in cognitive reflection

C. Media Trust

H3 Facebook deactivation will increase trust in the traditional media and decrease trust in social media

H3a Informational treatments will increase the magnitude of the effects of Facebook deactivation on both types of media trust

H3b education level (moderator) The effect of the Facebook deactivation on trust in the mainstream media will be larger among those with higher levels of education

H3c age (moderator) The effect of the Facebook deactivation on trust in the mainstream media will be larger among those are older

Note:

A5 Moderation analysis preliminary result

A5.1 Agenda Setting

Table A4: Agenda setting moderated by education

	<i>Dependent variable:</i>	
	Wave B	Wave C
	(1)	(2)
Received nudge	-0.032 (0.078)	0.066 (0.082)
No nudge	0.006 (0.076)	-0.037 (0.080)
Education	-0.004 (0.009)	0.012 (0.009)
Wave A	0.213*** (0.020)	
Wave B		0.316*** (0.023)
Received nudge : Education	0.001 (0.016)	-0.026 (0.016)
No nudge : Education	-0.004 (0.015)	-0.006 (0.016)
Control	0.161*** (0.044)	0.139*** (0.046)
Observations	1,955	1,955
R ²	0.058	0.096
Adjusted R ²	0.055	0.093
Residual Std. Error (df = 1948)	0.377	0.395
F Statistic (df = 6; 1948)	20.068***	34.498***

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

Table A5: Agenda setting moderated by age

	<i>Dependent variable:</i>	
	Wave B (1)	Wave C (2)
Received nudge	-0.097 (0.076)	-0.047 (0.079)
No nudge	-0.021 (0.079)	-0.139* (0.082)
Age	0.0002 (0.001)	0.002** (0.001)
Wave A	0.212*** (0.020)	
Wave B		0.312*** (0.023)
Received nudge : Age	0.002 (0.002)	0.00001 (0.002)
No nudge : Age	0.0002 (0.002)	0.002 (0.002)
Control	0.132*** (0.045)	0.089* (0.047)
Observations	1,955	1,955
R ²	0.059	0.102
Adjusted R ²	0.056	0.099
Residual Std. Error (df = 1948)	0.377	0.394
F Statistic (df = 6; 1948)	20.291***	36.790***
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

A5.2 Echo Chambers

Table A6: Found diverse information moderated by education

	<i>Dependent variable:</i>
	Diverse info Wave C
Received nudge	0.504 (0.451)
No nudge	−0.901** (0.447)
Education	0.081 (0.051)
Received nudge : Education	−0.138 (0.090)
No nudge : Education	0.130 (0.090)
Control	4.844*** (0.254)
Observations	2,246
R ²	0.007
Adjusted R ²	0.005
Residual Std. Error	2.354 (df = 2240)
F Statistic	3.330*** (df = 5; 2240)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Table A7: Found diverse information moderated by Age

	<i>Dependent variable:</i>
	Diverse info Wave C
Received nudge	-0.575 (0.435)
No nudge	-0.200 (0.449)
Age	-0.019*** (0.005)
Received nudge : Age	0.007 (0.009)
No nudge : Age	-0.004 (0.009)
Control	6.149*** (0.257)
Observations	2,246
R ²	0.013
Adjusted R ²	0.011
Residual Std. Error	2.348 (df = 2240)
F Statistic	5.840*** (df = 5; 2240)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Table A8: Encounter online information disagree with moderated by Education

	<i>Dependent variable:</i>	
	Disagree Wave B	Disagree Wave C
	(1)	(2)
Received nudge	0.353 (0.387)	0.997*** (0.349)
No nudge	-0.222 (0.379)	-0.024 (0.341)
Education	0.070 (0.044)	0.055 (0.040)
Disagree Wave A	0.386*** (0.021)	
Disagree Wave B		0.501*** (0.019)
Received nudge : Education	-0.101 (0.077)	-0.149** (0.070)
No nudge : Education	0.018 (0.076)	0.020 (0.069)
Control	2.992*** (0.248)	2.498*** (0.219)
Observations	1,955	1,955
R ²	0.156	0.275
Adjusted R ²	0.154	0.273
Residual Std. Error (df = 1948)	1.875	1.688
F Statistic (df = 6; 1948)	60.066***	123.222***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table A9: Encounter online information disagree with moderated by Age

	<i>Dependent variable:</i>	
	Disagree Wave B	Disagree Wave C
	(1)	(2)
Received nudge	-1.061*** (0.375)	-0.206 (0.339)
No nudge	-0.121 (0.390)	-0.281 (0.352)
Age	-0.015*** (0.004)	-0.011*** (0.004)
Disagree Wave A	0.384*** (0.021)	
Disagree Wave B		0.499*** (0.019)
Received nudge : Age	0.019** (0.008)	0.010 (0.007)
No nudge : Age	-0.002 (0.008)	0.007 (0.007)
Control	4.064*** (0.259)	3.316*** (0.236)
Observations	1,955	1,955
R ²	0.162	0.276
Adjusted R ²	0.159	0.274
Residual Std. Error (df = 1948)	1.869	1.687
F Statistic (df = 6; 1948)	62.611***	123.674***

Note:

*p<0.1; **p<0.05; ***p<0.01

A5.3 Trust in Media

Table A10: Trust in traditional media moderated by education

	DV: Trust in Traditional Media
	Wave C
Received nudge	0.039 (0.119)
No nudge	0.042 (0.118)
Education	0.026* (0.014)
Wave A	0.627*** (0.016)
Received nudge : Education	-0.004 (0.024)
No nudge : Education	-0.012 (0.024)
Control	0.743*** (0.074)
Observations	2,246
R ²	0.407
Adjusted R ²	0.405

Note:

*p<0.1; **p<0.05; ***p<0.01

Table A11: Trust in traditional media moderated by age

	DV: Trust in Traditional Media
	Wave C
Received nudge	0.034 (0.115)
No nudge	0.012 (0.119)
Age	0.001 (0.001)
Wave A	0.631*** (0.016)
Received nudge : Age	-0.0001 (0.002)
No nudge : Age	-0.0005 (0.002)
Control	0.798*** (0.079)
Observations	2,246
R ²	0.406
Adjusted R ²	0.404

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

Table A12: Trust in social media moderated by education

	DV: Trust in Social Media
	Wave C
Received nudge	0.055 (0.113)
No nudge	-0.085 (0.112)
Education	-0.002 (0.013)
Wave A	0.523*** (0.017)
Received nudge : Education	-0.015 (0.023)
No nudge : Education	0.009 (0.022)
Control	0.937*** (0.072)
Observations	2,246
R ²	0.287
Adjusted R ²	0.285

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

Table A13: Trust in social media moderated by age

	DV: Trust in Social Media
	Wave C
Received nudge	0.010 (0.109)
No nudge	0.080 (0.113)
Age	-0.001 (0.001)
Wave A	0.519*** (0.018)
Received nudge : Age	-0.001 (0.002)
No nudge : Age	-0.003 (0.002)
Control	1.003*** (0.076)
Observations	2,246
R ²	0.289
Adjusted R ²	0.287
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01