

Exposure to extremely partisan news from the other political side shows scarce boomerang effects*

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Abstract

Research shows that a narrow information diet may be partly to blame for the growing political divides in the United States, suggesting exposure to dissimilar views as a remedy. These efforts, however, could be counterproductive, exacerbating attitude and affective polarization. Yet findings on whether such boomerang effect exists are mixed and the consequences of dissimilar exposure on other important outcomes unexplored. To resolve this debate, we designed an experiment, in which one should certainly observe boomerang effects. We incentivized liberals to read political articles on extreme conservative outlets (Breitbart, The American Spectator, and The Blaze) and conservatives to read extreme left-leaning sites (Mother Jones, Democracy Now, and The Nation). We explored the effects on attitude and affective polarization, as well as on perceptions of the political system, support for democratic principles, and well-being. Overall we find little evidence of boomerang effects, suggesting they are an exception rather than the norm.

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1 Introduction

Political polarization is a problematic feature of many societies. Partisans hold increasingly disparate positions (Abramowitz and Saunders, 2008) and are becoming more hostile toward their political opponents (Iyengar et al., 2019). This problem is particularly relevant in the context of the ongoing debate about online echo chambers, which are said to polarize individual views and lead to outgroup hostility, (Garrett, 2009; Pariser, 2011; Barberá et al., 2015; Bakshy et al., 2015; Eady et al., 2019) and the discussion about the potential depolarizing benefits of a diverse media diet (Stroud, 2010; Helberger, 2012; Levendusky, 2013; Druckman et al., 2018; Iyengar et al., 2019). Democratic theorists have long argued that encountering dissimilar opinions and opposing arguments on issues of the day should promote “representative thinking” (Arendt, 1968, 241), “sound political judgment” (Page et al., 1996, 2), and “enlightened understanding” (Dahl, 1989, 105), and transform citizens into a cohesive collective (Barber, 1984), alleged outcomes that point to exposure to dissimilar views as a potential remedy to growing polarization. Accordingly, stakeholders such as social media companies (Farr, 2018-10-16), news organizations (Goodman and Chen, 2010), and public agencies and governments (Rendall, 2015) are actively working on reducing ideological bubbles and promoting exposure to diverse viewpoints. Evaluating whether exposure to dissimilar political perspectives indeed achieves the intended results is crucial for designing strategies that are effective at reducing polarization.

Existing research on the consequences of dissimilar exposure indicates that these types of interventions can generate a boomerang effect, exacerbating (rather than ameliorating) political misconceptions (Nyhan and Reifler, 2010), strengthening people’s policy differences –*attitude polarization*– (Zhou, 2016; Nyhan and Reifler, 2015; Bail et al., 2018), and generating more negative feelings towards political outgroups –*affective polarization*– (Garrett et al., 2014; Wojcieszak, 2011). These worrying effects are not borne out in other studies, however. Various scholars find mostly null effects when studying the same relationships (Guess and Coppock, 2018; Wood and Porter, 2019; Wood and Ethan, 2020), arguing that boomerang effects “are the exception, not the rule” (Guess and Coppock, 2018, 4). Given the potential large-scale societal implications of these types of interventions, it is theoretically and practically crucial to establish whether or not (and for whom) dissimilar exposure can backfire.

Furthermore, whereas attitude or affective polarization are arguably important, exposure to politically dissimilar views can have effects on broader systemic outcomes that go beyond issue attitudes or feelings toward political opposition, such as trust in the political system or support for key democratic principles, and also on individual well-being and health. If we find that dissimilar exposure attenuates affective polarization, but also minimizes trust in the political systems or diminishes people’s well being, should we promote dissimilar exposure, for instance? In short, existing research on the topic reports inconsistent results and is yet limited in scope.

In this paper, we offer both theoretical and methodological advancements. We combine experimental data with online behavioral traces from the same participants, with the aim of testing a set of pre-registered hypotheses and clearly disentangling whether dissimilar politi-

cal exposure leads to attitude and affective polarization, as well as has broader political and individual consequences. We constructed an extreme stimulus that, while unlikely to occur in the real world, is perfectly suited for the goal at hand. For a two week period in the U.S. we incentivize liberals to consume content from extremely conservative news sites (Breitbart, The American Spectator, and The Blaze), and incentivize conservatives to consume content from extremely liberal sites (Mother Jones, Democracy Now, and The Nation). If in this extreme scenario people do *not* polarize their attitudes and affective reactions to political outgroups, then we have very strong evidence in favor of the premise that boomerang effects are the exception and not the norm. If people do polarize, however, this counter-factual allows us to understand the scope and the boundary conditions of boomerang effects on both attitude and affective polarization, as well as on other relevant and related systemic and individual outcomes.

First, we examine whether consuming extreme news sites of the opposing ideology increases the extremity of people's attitudes on five salient political issues: the economy, climate change, gun control, immigration, and the Presidency of Donald Trump (i.e., attitude polarization). Our results align with [Guess and Coppock \(2018\)](#) findings: we do not observe people's policy views becoming more extreme; a finding that holds for the entire sample as well as for those with stronger political identities.

In addition to attitude polarization, we also test the effects of our counter-factual treatment on changes in people's levels of affective polarization toward a range of relevant political outgroups: how much they dislike, understand, and respect supporters of the opposing party, those of opposing ideology, and those holding opposing views on the five aforementioned issues. We find no increases in affective polarization towards out partisans and out ideologues, no matter the level of party and ideological strength of the respondents. However, exposure to extreme news sites from the opposing side does exacerbate (slightly) hostility towards those holding different views on some policy issues.

Finally, in order to have a better sense of the overall consequences of (extreme) dissimilar exposure for the political system and individual well-being, we assess potential effects on an additional set of outcomes that are closely related to political polarization: attribution of malevolence, willingness to compromise, perceived polarization, trust in key societal institutions, support for freedom of speech and of the press, as well as participant's well-being. We find also find null effects for this wide battery of items. In sum, we conclude that there is little evidence overall in favor of the general argument that exposure to dissimilar political content (here, exposure to extreme news sites of the opposing ideology) exacerbates attitude or affective polarization, or other relevant outcomes of interest.

2 Are there boomerang effects of exposure to opposing views?

In the United States as well as in many other societies, political divisions among elites ([McCarty et al., 2006](#)) and - according to some evidence - also among the mass public

(Abramowitz and Saunders, 2008) are on the rise. Some citizens, especially the strong partisans (Fiorina, 2006), increasingly hold more extreme ideological and policy positions (Abramowitz and Saunders, 2008), and the gap between issue attitudes of the left (Democrats) and the right (Republicans) has been steadily growing (Newport and Dugan, 2017). Furthermore, extensive research finds evidence for growing affective polarization: supporters of the different parties dislike members of the other party, attribute negative traits to their political opponents, and progressively avoid social interactions with those belonging to other political groups (Iyengar et al., 2012, 2019; Chen and Rohla, 2018). What can be done to mitigate increasing polarization, both in terms of attitude extremity and intergroup hostility? A prevalent line of theorizing and research points to partisan media and narrow media diets as key determinants of polarization (Garrett et al., 2014; Levendusky, 2013; Sunstein, 2011; Stroud, 2010; Wojcieszak and Garrett, 2018), and to cross-cutting flows of information as a potential remedy (Mutz, 2002; Nelson; Wojcieszak et al., 2020).

Descriptive accounts show that only a small fraction of the U.S. population are heavy consumers of partisan media and live in so-called media bubbles (Prior, 2013; Eady et al., 2019). Nevertheless, polarization has been on the rise partly because this small fraction encompasses strong and active partisans, who hold substantive influence over the political sphere (Druckman et al., 2018; Barbera et al., 2019). Existing research shows that consumption of partisan news or hyper-partisan content can lead to radicalization of issue attitudes (Levendusky, 2013), shifts in voting behavior (Gerber et al., 2009), and increases in hostility toward the political outgroup (Garrett et al., 2014; Wojcieszak et al., 2020). Furthermore, via personal networks, these polarizing effects can spread to those who do not consume partisan news directly (Druckman et al., 2018).

If exposure to like-minded information environments can increase polarization, work on cross-cutting networks and media exposure suggests that encountering counter-attitudinal information has the potential to moderate people's attitudes and feelings towards out groups: exposure to different viewpoints should foster tolerance and ameliorate polarization (Mutz, 2002; Nelson; Wojcieszak and Warner, 2020). In fact, a wide range of normative theoretical work argues that cross-cutting information flows are crucial for building a healthy, respectful, and sustainable democracy (Arendt, 1968; Barber, 1984; Page et al., 1996).

Other studies however show that exposing people to counter-attitudinal information and encountering political disagreement in one's online and offline networks can exacerbate rather than ameliorate political divides, arguing against this type of intervention. Existing literature suggests that people are more inclined to believe new evidence supporting (rather than opposing) their existing beliefs (Lord et al., 1986), to actively argue against information that goes against their beliefs (Edwards and Smith, 1996), and to expose themselves only to information that confirms their own views (Taber and Lodge, 2006). In turn, when exposed to opposing views, from the media and during online or face-to-face discussions, some studies find that - instead of moderating their views - people radicalize their policy attitudes (i.e. attitude polarization) across such outcomes as beliefs in non-factual information (Nyhan and Reifler, 2010, 2015), the strength of their policy views (Wojcieszak and Price, 2010; Zhou, 2016), and the policy views themselves (Zhou, 2016; Levendusky, 2013; Bail et al.,

2018). Other studies also find people to radicalize their feelings towards political out-groups (i.e. affective polarization), such as members of the opposing party (Garrett et al., 2014) or various personally disliked minority groups (Wojcieszak, 2011).

In regards to attitude polarization, in a study of the polarizing role of partisan media, Levendusky (2013) exposed experiment participants to counter-attitudinal news clips from FoxNews (for liberals) and MSNBC (for conservatives) and found that those with strong pre-treatment attitudes radicalized their policy views as a response to the treatment, finding evidence of attitude boomerang effects. The findings align with those of Wojcieszak and Price (2010), who found strong opponents of same-sex marriage to more strongly oppose it after a conversation with proponents of the policy. In a more recent study, Bail et al. (2018) found evidence of attitude boomerang effects among conservative (although not liberal) Twitter users, who radicalized their policy attitudes in the aggregate after following for one month a bot sharing 24 messages a day from political elites of the opposing ideology.

In regards to affective polarization, some studies also show the potential boomerang effects of exposure to dissimilar information. Garrett et al. (2014) asked survey respondents to self-report how much they consumed pro and counter-attitudinal news online and found consumption of pro-attitudinal news to be positively related to affective polarization and consumption of counter-attitudinal news sites to be negatively correlated with disliking members of the other party. However, for strong consumers of pro-attitudinal news, also consuming counter-attitudinal translated into disliking out-partisans even more.

However, another set of studies fail to replicate these results, mostly finding no boomerang effects from dissimilar exposure. As an example, in a recent study Guess and Coppock (2018) conducted three experiments to see if people's opinions about issues such as gun control and capital punishment radicalized after being exposed to counter-attitudinal factual information: they did not find that to be the case, concluding that boomerang effects are the exception rather than the norm.

Hence, despite its theoretical relevance and practical implications, the debate about the boomerang effects from exposure to opposing view is far from settled. Moreover, although existing studies have evaluated the consequences of such exposure on attitude and affective polarization, little is known about its further implications that may be more societally important than how one feels toward one's political outgroup (such as trust in key political institutions), and more personally relevant (such as individual sense of life satisfaction or levels of anxiety). The goal of this paper is two-fold: First, we help resolve the debate about boomerang effects and - second - we aim to better understand any further societal as well as individual effects of exposing people to counter-attitudinal news sources.

3 Outcomes of interest and Hypotheses

We study the effects of exposure to (extremely) dissimilar views on two widely studied outcomes, attitude and affective polarization (i.e., people's policy views and their feelings towards members of political outgroups), and on a set of unexplored outcomes that are closely related to polarization: attribution of malevolence, perceived polarization, support

for compromise, trust in societal institutions, support for freedom of press and of speech, and people's general well being, tapped with a variety of self-reported indicators. In this section we describe the set of pre-registered hypotheses we test.¹

3.1 Attitude Polarization

Most work on boomerang effects studies changes in policy attitudes, either by looking at attitude strength [Zhou \(2016\)](#), and/or attitude extremity [Wojcieszak \(2010\); Levendusky \(2013\); Guess and Coppock \(2018\); Bail et al. \(2018\)](#). We focus here on the latter, attitude extremity, so the extent to which people radicalize their views about particular policy issues, such as immigration and gun control, when exposed to counter-attitudinal information. A better understanding of attitude extremity is of particular relevance given that increasingly divergent policy views are often to blame for government inaction and gridlock ([Lee, 2015](#)).

Existing literature finds mixed results on whether *in general* people's policy attitudes become more extreme after exposure to counter-attitudinal information ([Guess and Coppock, 2018; Bail et al., 2018](#)). In this regard, the motivated reasoning literature predicts boomerang effects particularly among those with strong political convictions and attachments ([Lord et al., 1986; Taber and Lodge, 2006](#)): those with clearly defined policy views are likely to avoid consuming information that goes against their views as well as to adopt defensive and reactive strategies when exposed to counter-attitudinal information. However, most people do not hold clear policy position and do not follow nor care about politics much ([Converse, 1964; Carpinini and Keeter, 1996; Hibbing and Theiss-Morse, 2002](#)), making systematic boomerang effects rather unlikely in the aggregate. However, according to [Taber and Lodge \(2006\)](#)'s logic, we should expect those with stronger political predispositions to be more likely to polarize their attitudes when exposed to counter-attitudinal information. In line with this train of thought, we pre-registered the following hypotheses:

H_{1a} Participants exposed to extreme news sites of the opposing ideology will not polarize their policy attitudes.

H_{1b} Participants with stronger political identities will be more likely to polarize their policy attitudes when exposed to extreme news sites of the opposing ideology.

3.2 Affective Polarization

Beyond attitude extremity, increasing animosities between members of distinct political groups also get in the way of maintaining a healthy society and advancing policy solutions to relevant political and societal problems ([Iyengar et al., 2019](#)).

Despite not paying too much attention to politics ([Hibbing and Theiss-Morse, 2002](#)), most people feel attached to particular political groups ([Campbell et al., 1980](#)) and interpret the day-to-day politics using an us-*versus*-them logic ([Tajfel et al., 1979](#)). Exposure

¹See pre-registration in the following link: https://osf.io/vxqzt/?view_only=11e823483f0c4c8ab73f6897baebaa8d

to counter-attitudinal information may not clearly offer a path towards radicalizing one's policy views, but it may emphasize and make in/out-group conflicts more salient, increasing people's negative feelings towards members of those out-groups. Such in/out-group distinction should be more clear to those with stronger political-group attachments. The next set of pre-registered hypotheses predicted these main and heterogeneous effects on affective polarization:

- H_{2a}** Participants exposed to extreme news sites of the opposing ideology will hold more negative feelings towards members of political out-groups.
- H_{2b}** Participants with stronger political identities will be more likely to hold more negative feelings towards out-group members when exposed to extreme news sites of the opposing ideology.

3.3 Perceptions of the political system

Literature suggests that a positive perception of the political system contributes to political stability and facilitates a well-functioning democracy (Marien and Hooghe, 2011; Agroskin et al., 2015). In this experiment, we focus on evaluating the effect of our treatment on five systemic indicators: a) attribution of malevolence (i.e. whether respondents believe that the out-party wants to harm the country), b) support for political compromise (i.e. whether politicians should be open to compromise), c) perceived polarization (i.e. the extent to which participants perceive the political system as polarized), d) people's trust in a set of institutions, and e) whether people are in favor of two long-standing democratic principles, freedom of speech and freedom of press. In line with the two previous hypotheses, we expect exposure to extreme domains of the opposing ideology to activate the presence of divergent views and conflicted groups, and to make people more pessimistic about the state and health of the political system. We also expect more pronounced effects among those with stronger political identities/attachments.

- H_{3a} Attribution of malevolence:** Participants exposed to extreme news sites of the opposing ideology (**H_{3b}** especially those with stronger political identities) will be more likely to believe that members of the other party want to harm the country.
- H_{4a} Support for compromise:** Participants exposed to extreme news sites of the opposing ideology (**H_{4b}** especially those with stronger political identities) will be less likely to support reaching political compromises.
- H_{5a} Perceived polarization:** Participants exposed to extreme news sites of the opposing ideology (**H_{5b}** especially those with stronger political identities) will be more likely to perceive the political climate as polarized.
- H_{6a} Trust in institutions:** Participants exposed to extreme news sites of the opposing ideology (**H_{6b}** especially those with stronger political identities) will be less likely to

trust key societal institutions such as the Government, the U.S. Supreme Court, police, scientists, journalists, and university professors.

H_{7a} Support for freedom of speech and of press principles: Participants exposed to extreme news sites of the opposing ideology (**H_{7b}** especially those with stronger political identities) will be less likely to endorse these key democratic principles.

3.4 Subjective well being

Preserving people's well being is a desirable goal from a normative and humanitarian perspective. News consumption can generate emotional discomfort (Valentino et al., 2008), especially when people are exposed to information challenging their prior views and principles. For example, Marcus et al. (2000) find people to feel more anxious when consuming news about negative electoral prospects of their party. Building on political psychology models such as Marcus et al. (2000)'s "affective intelligence," and on the literature on motivated reasoning (Taber and Lodge, 2006), we expect exposure to extreme opposing opinions to worsen how people feel (i.e. more anxious and less happy) and to increase behaviors induced by anxiety (i.e. consuming higher levels of alcohol and/or junk food) or anger (i.e., getting into arguments or a desire to hit someone):

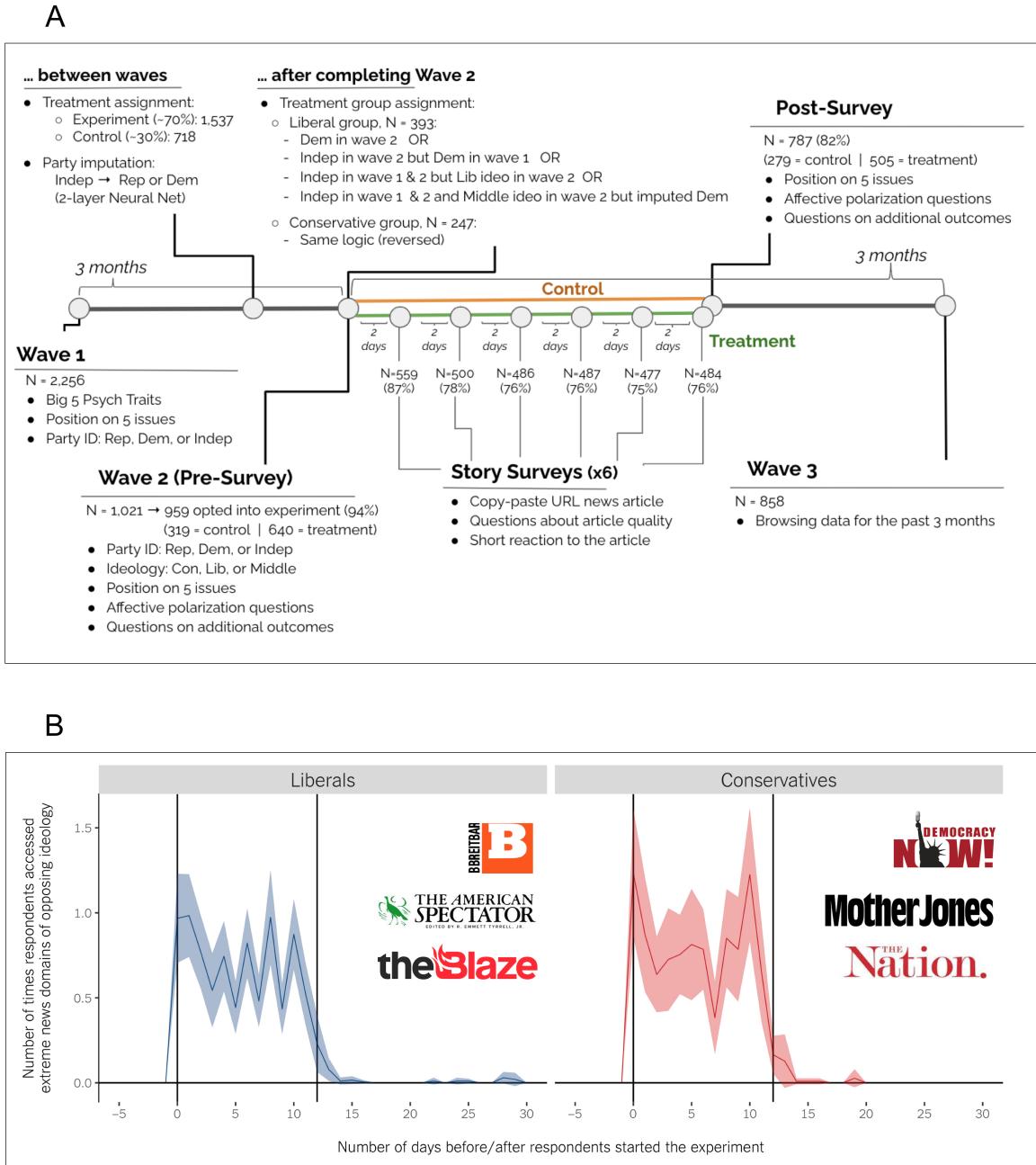
H_{8a} The well being of participants exposed to extreme news sites of the opposing ideology (**H_{8b}** particularly those with stronger political identities) will worsen after exposure to extreme domains from the other side.

4 Research Design

Figure 1.A provides an overview of the research design. We embedded an experiment in the second wave of a 3-wave panel study in which, every three months, the same respondents answered a 20-minute survey about their political views and news diet, and submitted their web browsing data using a novel web browser plug-in that allows for transparent data sharing (Web Historian). We recruited the respondents via Lucid, an aggregator of survey respondents from many sources, which collects demographic information on the panelists, facilitating quota sampling to match the US Census margins. Before inviting them to participate in the second wave, the 2,256 respondents who completed the first one were assigned to receive a treatment (with a 70% probability) or be in a control group. Then, after completing the second wave, and so after providing pre-treatment values for the variables of interest (policy attitudes, levels of affective polarization, and levels of partisan and ideological attachment, among others), respondents were invited to an additional study "on the quality of news" (this experiment).² Out of the 1,021 that completed the second wave, 959 (94%) opted in to take part in the additional study. At this point, respondents in the treatment

²Respondents were not aware that they were participating in an experiment; nor of the nature of the actual study until they were debriefed at the end of the study.

Figure 1: (A) An outline of the research design. (B) Average number of times respondents in the treatment groups accessed the opposing extreme news sites used in the study; before, during and after the experiment.

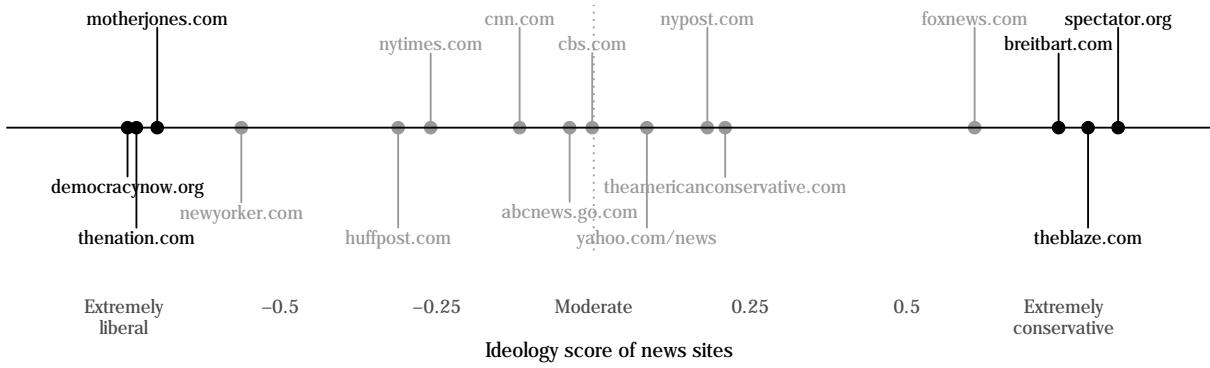


group ($N = 640$, *v.* 319 in the control group) were assigned to either a liberal ($N = 393$) or a conservative group ($N = 247$) based on their pre-treatment partisanship.³

³Respondents were assigned to the liberal group ($N = 393$) if they fulfilled one of the following conditions: they were (a) a Democrat in wave 2 ($n = 346$, 88% of 393), (b) an Independent in wave 2 but had indicated

Then, for a twelve day period, respondents in the liberal and conservative treatment groups were instructed to increase exposure to (very) dissimilar political news sources. Every other day, they were asked to access one of the three extreme news domains of the opposing ideology (Breitbart, The American Spectator, and The Blaze for liberals; Mother Jones, Democracy Now, and The Nation for conservatives) and read a political article on a salient political topic. As shown by the validated ideology scores (Robertson et al. 2018) in Figure 2, we chose these six outlets because they indeed represent the most extreme ideological spaces of the existing media environment, and they are equally extreme on each side of the ideological space.

Figure 2: Ideology scores for the 6 extreme sites used in this experiment, as well as for some other mainstream sites. Source of ideology scores: Robertson et al. 2018



To assure compliance, participants were additionally instructed to copy-paste the URL of the news article, write a brief reaction to the article, and answer two multiple-choice questions about the quality of the article. We use their answers to these six “story surveys” to measure compliance at the individual-level.⁴ Respondents in the control groups did not engage in any additional activity. The story surveys also allow us to better understand participants’ subjective reactions to the treatment, particularly the open-ended question where they were asked to describe their reaction to the article in one sentence or more.

After the twelve day period, participants in both treatment and control groups were invited to complete a post-test survey that assessed the outcomes of interest. In total,

to be a Democrat in wave 1 ($n = 14$, 4%), (c) an Independent in wave 1 and 2 but a liberal according to an ideology question in wave 2 ($N = 10$, 3%), and (d) an Independent in wave 1 and 2, and a moderate in wave 2, but who was imputed to be a Democrat according to a highly accurate 2-layer neural net (87% precision and recall) we trained using the answers to a set of policy issues and psychological traits questions from wave 1 ($N = 23$, 5%). The remaining respondents to be treated were assigned to the conservative group ($N = 247$): (a) 211 (85% of 247) said to be a Republican in wave, (b) 8 (3%) to be an Independent in wave 2 but a Republican in wave 1, (c) 14 (6%) to be an Independent in both waves but to have a conservative ideology in wave 2, and (d) 14 (6%) who reported to be Independents and have moderate ideology in both waves but we imputed to be Republicans.

⁴A respondent is considered to have complied if: (a) the provided URL actually links to one of the assigned extreme news sites, (b) the article is about a political topic, and (c) they wrote a response to the article they read. Overall, this strategy ensures that participants actually complied with the treatment.

279 respondents in the control group and 505 in the treatment group completed the post survey, constituting the final sample for the study (a sample size similar to the most recent papers on this topic, i.e. (Bail et al., 2018)). As an additional compliance check, we take advantage of the unique opportunity to return to the same respondents three months later as part of the third wave of data collection for the main project. Before completing this new wave, participants provided around 3 months of online browsing data stored on their computers, which we used for an additional compliance check by examining the specific domains and URLs that they visited during the experiment. As Figure 1.B illustrates, on average respondents assigned to one of the treatment groups did access the extreme news sites at the expected rates (around once every other day, so between .5 and 1 a day during the time of the experiment).

5 Measures

Attitude extremity. To test H_{1a} and H_{1b} , in the pre and post survey we measure respondents' attitudes about five policy issues (economy, climate change, gun policy, immigration, and the Presidency of Donald Trump) by asking them fifteen questions, three per issue, each about a different sub-issue domain. Subjects have to choose whether they feel closer to a liberal or conservative statement at each end of a 13-point scale.⁵ Table 1 provides a list of the sub issue dimensions and the left-right leaning statements, paraphrased.⁶ We average the responses to the three sub-issue dimensions and report changes in attitudes towards the five macro issues.⁷

Affective polarization. To test hypotheses H_{2a} and H_{2b} , we measure affective polarization towards out-partisans (Republicans or Democrats), out-ideologues (conservatives or liberals), and those who hold different policy positions on the five issues. Each measure captures a slightly different, but very relevant, way of negative outgroup attitudes. First, we use two widely validated measures: 100-point feeling thermometers (how warm people feel about the opposing group) (Iyengar et al., 2012) and negative trait ratings (Levendusky and Malhotra, 2015) (how much respondents agree that outgroup members are qualified with a negative adjective in a 7-point scale, e.g., ‘stupid’). Although these classic measures are relevant, what seems to be even more needed in the current political climate is basic respect for the political outgroup and their positions: one may dislike the outgroup but nevertheless respect and understand its perspectives. We thus ask the respondents how much they understand the views of outgroup members (7-point scale). In addition to accounting for different consequential facets of affective polarization, using multiple measures also ensures that the detected patterns are not due to any specific measurement alone and that the measurements are robust to contexts and outgroups.

⁵These statements were taken or adjusted from questions asked by ANES, PEW, and Gallup.

⁶See Appendix A for the actual wording of the statements

⁷In Appendix C you can find the results broken down by sub-issue dimension.

Table 1: Policy dimensions measured in the pre and post surveys. In italics we indicate the position describing the *liberal* end of the scale, and show the conservative position in parentheses.

Reference	Policy dimension
Econ-1	<i>More</i> (v. less) government regulation of business
Econ-2	<i>More</i> (v. less) taxes to pay for public services
Econ-3	<i>Less</i> (v. more) free trade
Env-1	<i>More</i> (v. less) strict environmental regulation
Env-2	Human action <i>has</i> (v. has not) caused global warming
Env-3	US <i>should</i> (v. should not) emphasize alternative energy
Immig-1	Immigrants <i>strengthen</i> (v. weaken) the country
Immig-2	Illegal immigrants <i>should</i> (v. should not) be able to stay
Immig-3	Immigration <i>enriches</i> (v. impoverishes) American identity
Gun-1	<i>More</i> (v. less) regulation for buying a firearm
Gun-2	Banning the sale of semi-automatic weapons <i>will</i> (v. will not) prevent mass shootings
Gun-3	Concealed carriage <i>should not</i> (v. should) be allowed anywhere
Trump-1	Trust Donald Trump <i>less</i> (v. more) than other presidents
Trump-2	President Trump respects white and men <i>more</i> (v. equally) than women and minorities
Trump-3	Trump's presidency has been <i>bad</i> (v. good) for the economy

Perception of the political system. Attribution of malevolence: (H_{3a} and H_{3b}) we average the responses to five Likert-type questions asking respondents to indicate how much they think that the opposing party wants to hurt the country (Warner and Villamil, 2017).⁸ Support for compromise: (H_{4a} and H_{4b}) we average the answers to four Likert-type questions (found to be valid and reliable in the first wave of data collection) asking respondents to indicate how much they believe that Republicans and Democrats should work together.⁹ Perceived polarization: (H_{5a} and H_{5b}) we average the responses to four Likert-type questions asking subjects how much they perceive the current political climate as polarized (again, validated during wave 1).¹⁰ Trust in institutions: (H_{6a} and H_{6b}) we average the responses to Likert-type scale questions indicating how much they trust six key societal institutions. We ask about three institutions known to currently be more trusted by Republicans (the U.S. Federal Government, the Supreme Court, and the police) and three known to be more trusted by Democrats (scientists, journalists, and university professors) (Pew, 2017).¹¹ Support for freedom of speech: following (Mutz, 2002)'s strategy, we average responses to Likert-type scales asking respondents about the extent to which members of the opposing ideology should be allowed (a) in the media, (b) to make public speeches, (c) to hold public rallies, and (d) to teach in schools. Support for freedom of press: we average three responses about the extent to which (a) some media outlets should be made illegal, (b) Google should

⁸The five items can be found in Appendix B.1, as well as their correlations.

⁹The four items, and the correlation among them, can be found in Appendix B.2

¹⁰The four items, and the correlation among them, can be found in Appendix B.3

¹¹See item wording and correlations in Appendix B.4.

not show articles from some media outlets, and (c) social media companies should avoid promoting articles from some media outlets. The two last batteries (freedom of speech and freedom of press) were only asked in the post survey and so we use between-group difference to test hypotheses H_{7a} and H_{7b} .

Well being. First we average the responses to six 7-point scale questions about the extent to which respondents felt the following in the previous week: (a) calm and peaceful, (b) optimistic about their future, (c) satisfied with their life, (d) happy, (e) anxious, and (f) depressed. These are questions often used to measure subjective well being (Lyubomirsky and Lepper, 1999; Huppert, 2009; Kahneman and Krueger, 2006; Allcott et al., 2020). We also asked respondents about how many days in the previous week they undertook a set of actions: some of them known to be unhealthy (i.e. order fast food and/or drink more than one alcoholic beverage a day), some known to be healthy (i.e. exercise), as well as how often they engaged in violent behavior (i.e. felt like hitting someone and/or got into an argument). Overall, these two batteries help us analyze whether the treatment had some effect on various indicators of people's well-being (H_{8a} and H_{8b}). These two batteries were also only asked in the post survey.

Moderators. We consider three validated moderators (Huddy et al., 2020) measuring the strength of people's political attachments. *Party strength*: we fold a 7-point party ID question to create a 4-point party strength measure ranging from Independent to Strong Democrat/Republican. *Ideology strength*: we fold a 11-point ideology question to create a 6-point ideology strength scale ranging from middle ideology to extreme liberal/conservative. *Party identity strength*: we average the responses to four 7-point questions asking respondent about how much they identify with the party option they selected in a party ID question (Democrat, Republican, or Independent).¹²

6 Results

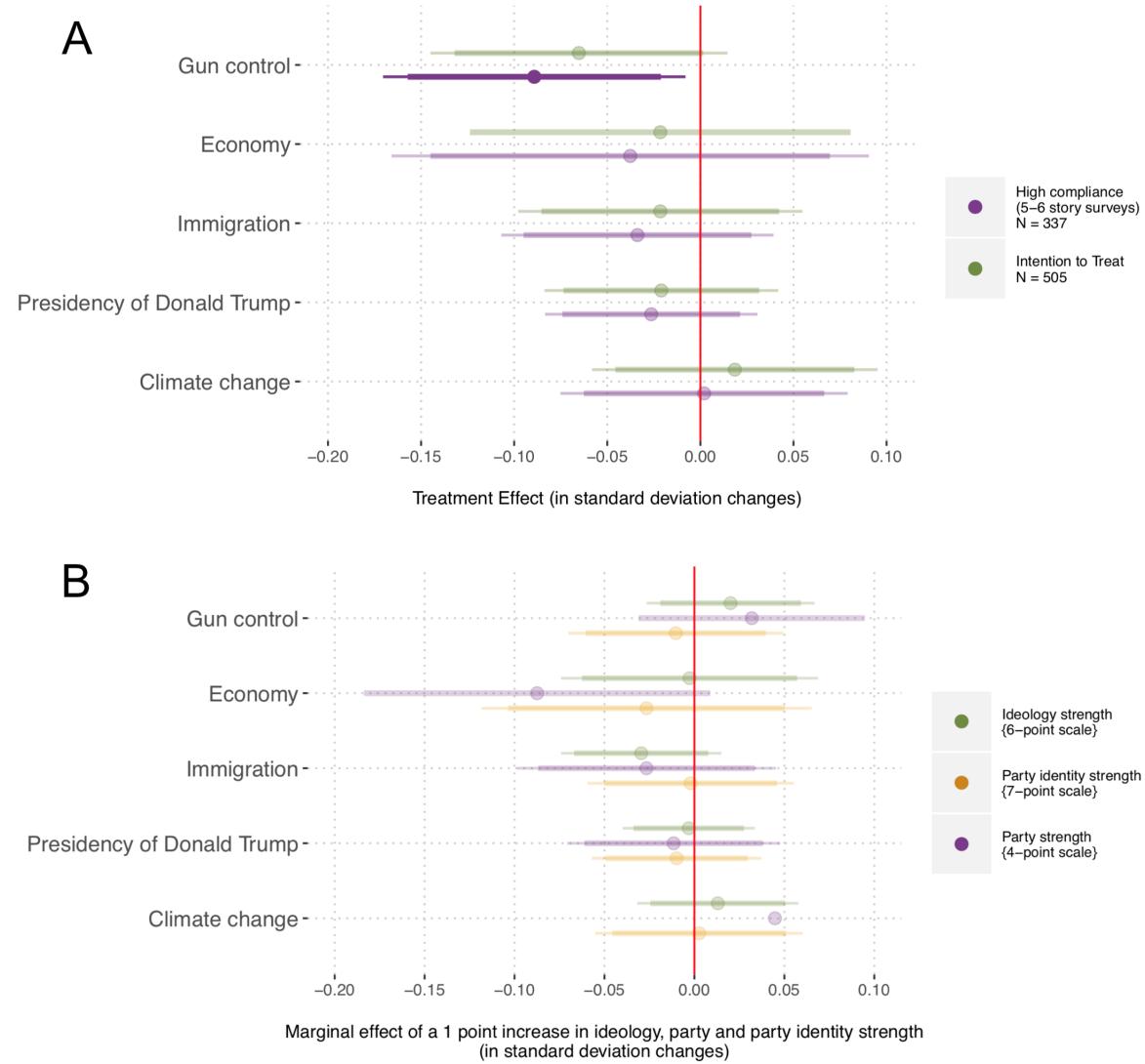
6.1 Attitude Polarization

First we focus on analyzing the effects of exposure to dissimilar views on attitude and affective polarization, and then we transition to exploring further effects on people's perceptions of the political system, their support for key democratic principles, and their well being. Finally we conclude by looking at how respondents valued the news outlets of the opposing ideology to which they were exposed and by discussing the theoretical implications of our findings.

In Figure 3.A we report post-treatment differences in attitude polarization between the treated respondents (i.e., those who read extreme sites from the other political side) *versus* control for the five issues of interest, controlling for pre-treatment values. The responses to the policy items were recoded so that higher pre and post treatment values indicated

¹²The four items measuring political identity strength, and the correlation among them, can be found in Appendix B.5

Figure 3: (A) Linear models predicting changes in issue positions between pre and post test, as a function of assignment to treatment. (B) Linear models predicting the same issue position changes, as a function of an interaction between assignment to treatment and each theorized moderator. The bars indicate 95 and 90% confidence intervals.



more extreme positions for both the liberal and the conservative participants (recall that we did not hypothesize any heterogeneous effects based on ideology)¹³. We then calculated individual-level post treatment differences and estimated treatment effects by fitting a linear model with assignment to treatment as a single covariate.¹⁴ In Figure 3 we report whether

¹³See Appendix D for a moderator analysis including partisanship. We find null effects, so conservatives are liberals reacted similarly to our treatment.

¹⁴Random assignment was successful: a linear model predicting assignment to treatment as a function of a set of socio-demographic covariates (age, gender, ethnicity, education, as well as a measure of interest in

those exposed to extreme news sites of the opposing ideology radicalized (higher values) or moderated (lower values) their issue positions, compared to those in the control group. Across the models, following the strategy used in recent publications on this topics (i.e. Bail et al. 2018), we report Intention To Treat (ITT) estimates (*Assigned to Treatment* panel) as well as Casual Average Compliance Effects (CACE) for the respondents who more clearly complied with the treatment (those who completed at least 5 of the 6 story surveys): ITT estimates allow us to assess the effect of being assigned to treatment independently of compliance, and looking at those who fully complied assures that any difference was caused by our treatment.¹⁵

The ITT estimates in Figure 3.A indicate that those *Assigned to Treatment* did not polarize their attitudes on any of the policies (economy, climate change, immigration, gun policy, and Presidency of Donald Trump). If we look at those who complied with the treatment (*High Compliance* panel), we also observe no evidence of attitude polarization. In fact, those who most often visited the extreme sites of the opposing ideology (high compliers) moderated their views on gun control. Overall, the ITT estimates as well as the CACE for high compliers strongly corroborate H_{1a} : participants' issue attitudes did not become more extreme.

Then, although we did not expect people's attitudes to polarize in the aggregate, we did hypothesize boomerang effects among those with stronger political predispositions (H_{1b}), in particular those with higher *Ideology Strength*, *Party Strength*, and *Party Identity Strength*. In Figure 3.B we show the results of fitting three linear models predicting changes in issue attitudes as a function of an interaction between assignment to treatment and each of the moderators. We fit the model with data from all respondents assigned to treatment. We do not find any support for our hypothesis H_{1b} in any of the three moderator models. In sum, the results in Figure 3 strongly align with the argument that boomerang attitude-extremity effects are the exception rather than the norm (Guess and Coppock, 2018), even in situations when those with strong political priors are exposed to content from extreme news sites of the opposing ideology.

6.2 Affective Polarization

In Figure 4 we use the same approach to explore general and heterogeneous effects on affective polarization – so changes in the extent to which respondents disliked members of political out groups as the function of our experimental treatment. We evaluate changes in three indicators of affective polarization: the traditional feeling thermometer (left panel), whether respondents understand the position of out-group members (middle panel), and whether they think that these out-group members are stupid. In the analyses, the *feeling thermometer* and *understand* measures are reversed so that higher values in Figure 4 always indicate that respondents in the treatment group became more affectively polarized, compared to those in

politics) generated no statistically significant results.

¹⁵ Appendix C presents finer-grained results for this and the following sections (i.e. attitude extremity results broken down by sub-issue rather than by issue); as well as results for those who barely/moderately complied with the treatment.

the control group. To offer a comprehensive portrayal of backlash effects, we assess affective polarization toward three different types of out-groups: those of the opposing ideology, opposing party, and those who hold different views on the five issues, the economy, climate change, immigration, gun policy, and the Presidency of Donald Trump.

Figure 4: (A) Linear models predicting changes in affective polarization between pre and post test, as a function of assignment to treatment. (B) Linear models predicting the same changes in affective polarization, as a function of an interaction between assignment to treatment and each of the theorized moderators. The bars indicate 95 and 90% confidence intervals.

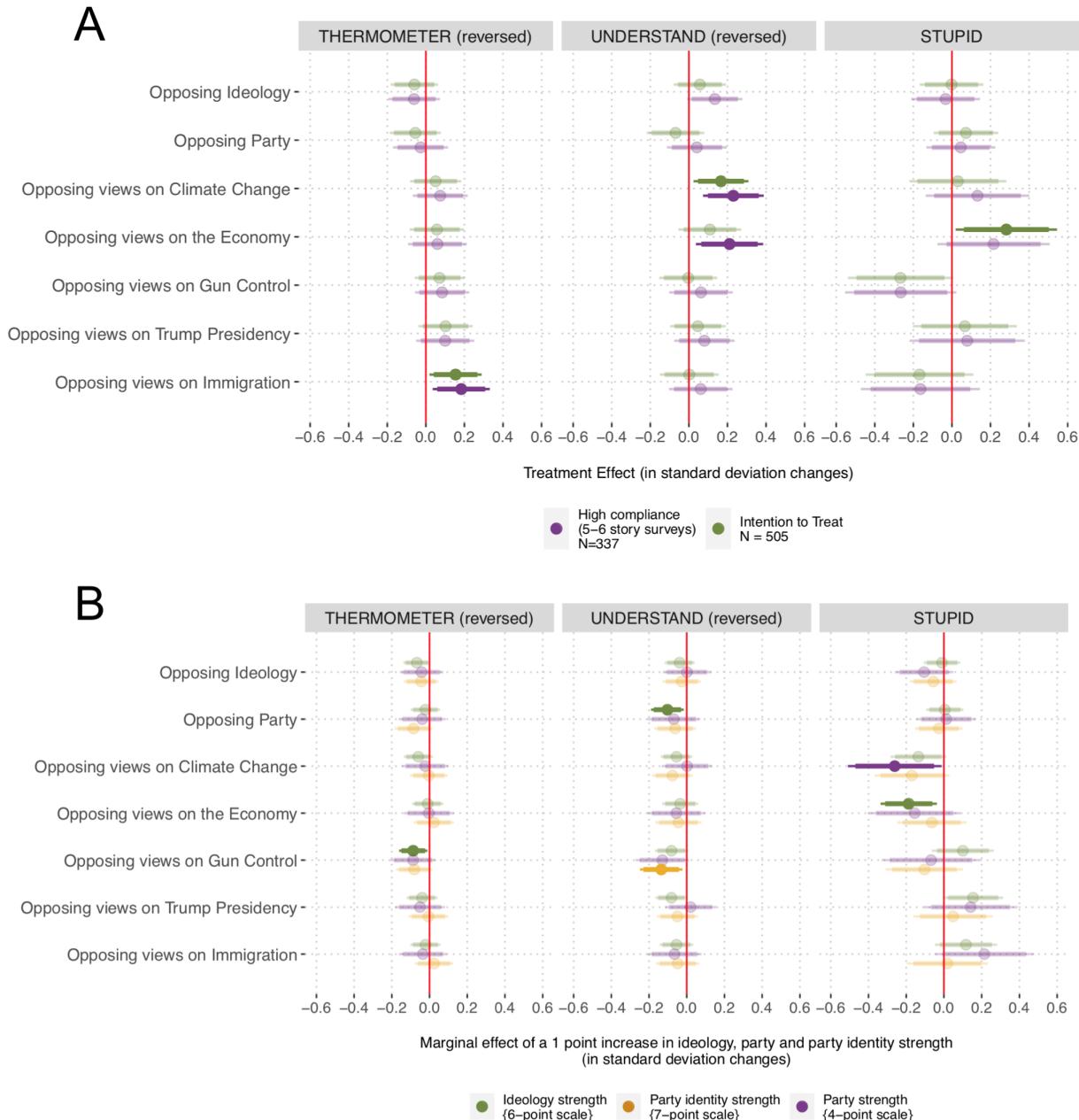


Figure 4 clearly shows that, independently of which indicator we examine, people did not become more negative towards members of the opposing ideology nor those of the opposing party (no significant positive difference in the first two rows of any of the three panels). However, those who read extreme news sites of the opposing ideology became more negative toward those who opposed their views on several of the issues studied. For example, according to the ITT estimates and the CACEs for high compliers, compared to subjects in the control group, the treated partisans felt colder towards those with different views on immigration, understood less those with opposing opinions on climate change and the economy, and were more likely to believe that those with opposing views on the economy were stupid. Overall, we find no support for H_{2a} as it relates to out-partisans and out-ideologues, and we find mild support (small effects between 0.1 and 0.3 standard deviation changes) as it relates to those who hold opposing views on some particular issues. We speculate that our treatment exacerbated policy-based affective polarization and not party- and ideology-based affective polarization because people may not have associated single-issue news stories with the broader out-party or out-ideology. Our treatment is different in this regard from Bail et al. (2018), who exposed Twitter users to tweets clearly authored by out-party elites, such as President Trump.

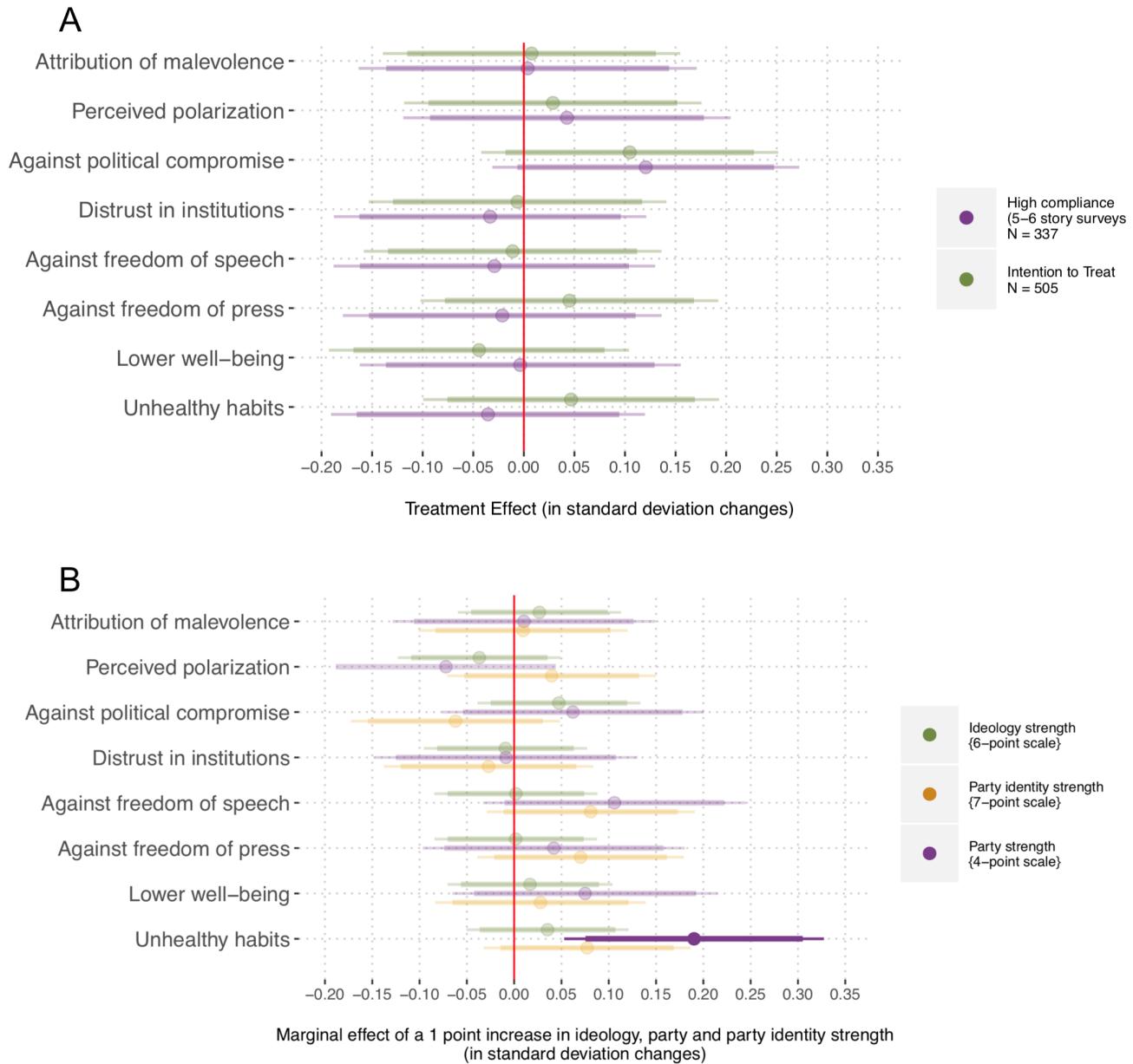
In Figure 4.B we find no support for the expectation that, after consuming extreme news sites of the opposing ideology, participants with stronger political identities are more likely to hold more negative views towards political outgroups (H_{2b}). None of the coefficients reported in the figure are positive and statistically significant – not being able to corroborate the hypothesis. In fact, contrary to what we expected, for some of the indicators we find those with stronger political identities to be *less* likely to radicalize their opinions towards the tested outgroups, an effect that could be driven by a ceiling effect where those with stronger identities are already fully affectively polarized so they can only revert, and the content of the outlets does regularly emphasize intra-ideological conflict showing that those on the other side are not of one mind (Koger et al., 2010). Also, there is more room for those with weaker political identities to be polarized when reminded of conflicting points of view.

6.3 Further consequences of exposure to dissimilar views

Next, we discuss the extent to which our treatment had an effect on other related outcomes of interest, beyond attitude and affective polarization. In Figure 5.A we report general treatment effects for the rest of the tested outcomes. In the first three rows, we report effects for outcomes closely related to affective polarization: whether people think out-partisans want to harm the country (*Attribution of malevolence*), whether they perceive the political climate as polarized (*Perceived polarization*) and whether they are against politicians crossing the aisle and reaching political compromises (*Against political compromise*). Then we also report differences on how much they trust key societal institutions, whether they are against freedom of speech and freedom of press, and whether they reported lower levels of subjective well-being and to undertake unhealthy activities at a higher rate. For the first four items we estimate differences between treatment and control while controlling for pre-test values. The last four items were only asked in the post survey and we estimate differences between

treatment and control.

Figure 5: (A) Linear models estimating the effect of exposure to extreme news sites of the opposing ideology on a variety of outcomes relevant for the understanding of political polarization. (B) Linear models predicting the same outcomes, as a function of an interaction of assignment to treatment and each theorized moderator. The bars indicate 95 and 90% confidence intervals.



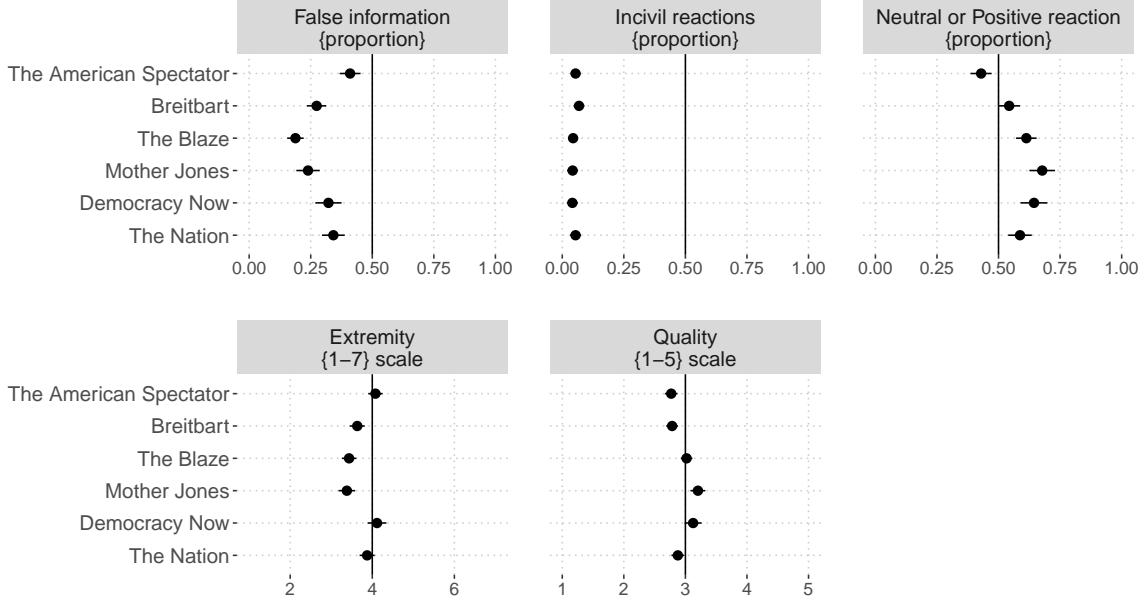
Overall, we do not see in Figure 5.A that exposure to extreme news sites of the opposing ideology had any meaningful effect on any of these additional outcomes, showing no support

for our hypotheses ($H_{3a,4a,5a,6a,7a,8a}$), and extending the previous evidence in favor of the argument that the negative effects of dissimilar exposure are rather rare; a null finding that holds when looking at those assigned to the treatment group as well as those who more strongly complied with the treatment.

In Figure 5.B we explore whether those with stronger political attachments were more likely to radicalize their positions on the additional outcomes presented in Figure 5. Overall, we do not clearly observe stronger effects for those with higher ideology, party, and party identity strength. As a minor (although non-trivial) exception, those who identify themselves as strong Democrats/Republicans were more likely undertake unhealthy activities (such as order fast food). In sum, the evidence does not support our hypotheses $H_{3b,4b,5b,6b,7b}$ and provides mild support for H_{8b} .

6.4 Outlet evaluation

Figure 6: Opinions about and reactions to the extreme news sites to which respondents were exposed.



As a final exploratory assessment of the effects of exposure to extreme sites of opposing ideology, in Figure 6 we report people's reactions to the outlets and the political stories in the news sites, to which they were exposed. For one, respondents indicated whether they perceived the outlets to have extreme issue positions and whether they thought the articles they read were of good quality. In the two bottom panels in Figure 6 we observe that people thought that the views of the outlets were rather moderate (*Extremity* panel: an average score between 3 and 4 in a 7-point extremity scale) and of medium quality. This indicates that despite being exposed to some of the most extreme news outlets on the other end of the ideological spectrum, respondents still valued what they saw, and on

most occasions they did not have a negative reaction. Second, respondents were told that our study was about evaluating news quality and thus they provided an assessment of the political articles they read. The open-ended text reactions to each article the participant read were coded as positive, neutral, negative, or mixed, and also as using uncivil language or not.¹⁶ Shedding important light into the tested effects, people did not have an overwhelmingly negative impression of these extreme out-group outlets – as accounts predicting boomerang effects would argue, and as we initially expected. The indicators in the top three panels are proportions. For all six outlets, less than 50% of the respondents reported that the stories they read provided false or made up information (and only between 20-25% for outlets such as *Breitbart*, *The Blaze*, and *Democracy Now*). Less than 10% used uncivil language when writing a reaction to the article they read, for example “... I felt irritated that crap like this is even given a platform and audience.” In all cases except *The American Spectator*, more than 50% of the respondents wrote a neutral or positive reaction such as, (from a Democratic participant) “It was a good exercise in open-mindedness for me. I chose it [the article] because I like and respect Ben Stein and was genuinely curious about his topic. It was moving as he recounted the heroes of WWII and then explained about China’s advances/Trump’s policies. While he may be ascribing better intelligence and motives to Trump, I still took away a new grain of respect for Trump, just in case Stein’s understanding is correct.”¹⁷, (from a Repbulican participant) “Even as a Republican, I agree with the tax credit for housing when it costs more than 30% of a family’s income.”¹⁸ or “It was okay. It was not [sic]to slanted, and it did a fairly good job recalling the story ...”¹⁹.

7 Discussion

In the US, greater harmony between different political factions is needed more than ever. To achieve this ever-eluding goal, scholars and practitioners encourage exposure to dissimilar political views, with the hope that encountering views that challenge one’s beliefs will minimize extremity and interparty hostility. Although some scholars caution against this approach, suggesting that dissimilar exposure can increase polarization, the findings about the existence of such boomerang effects are mixed and limited in scope.

Given the crucial societal and political implications of this largely inconclusive debate, we set out to solve it with an innovative experimental design combining incentivized over time exposure to extreme news domains from across the political aisle (*Breitbart*, *TheAmerican Spectator*, and *The Blaze* for liberals; and *Mother Jones*, *Democracy Now*, and *The Nation* for conservatives), pre-, post-, and intermediate surveys, and trace data on actual online exposure of the participants. Although this design is highly counterfactual (after all, most

¹⁶On average, participants wrote 31 words in reaction to this question (median 21 words). Two trained coders categorized the 2,844 article reactions with 15% overlap and achieved a Cohen’s Kappa intercoder reliability score of 0.84 for the sentiment coding, and 0.94 for civility.

¹⁷Reaction to the following article: <https://spectator.org/why-i-pray-for-trump-a-true-hero/>

¹⁸Reaction to the following story: <https://www.motherjones.com/politics/2019/09/vouchers-tax-credits-zoning-can-a-president-do-anything-to-fix-the-housing-crisis/>

¹⁹Reaction to: <https://www.theblaze.com/news/msnbc-s-chris-hayes-unleashes-conservatives-over-alleged-sim>

liberals are unlikely to regularly visit Breitbart), it was well suited to detecting boomerang effects if these are in fact a likely outcome of exposure to dissimilar views. The design also allowed us to test whether the studied dissimilar exposure has effects on broader societal outcomes and on individual well-being, and also among those for whom these effects emerge (attending to a systematic set of political predispositions to ascertain potential heterogeneous treatment effects).

In short, despite the over time nature of the treatment (i.e., fourteen days), accounting for intended treatment effects as well as the levels of compliance (see [Bail et al. \(2018\)](#)), and testing attitude polarization on a range of salient political issues and affective polarization with several indicators and toward various outgroups, we show that dissimilar exposure is unlikely to intensify political conflict or have any discernible effects on the societal and individual outcomes tested.

After going to extreme news sites of the opposing ideology every second day for a two-week period, people did *not* radicalize their issue attitudes nor their feelings towards the out-party and the supporters of the opposing ideology. Although we did find that people slightly polarized their perceptions of those holding opposing views on a few political issues (such as climate change and immigration), these effects were not systematic across different measurements and did not generate a pattern that would suggest the existence of relevant boomerang effects (< 0.2 standard deviation changes). Furthermore, although many observers fear that strong partisans are most likely to radicalize and drive political conflict ([Garrett et al., 2014](#)) and the work on motivated reasoning suggest that individuals with strong priors are most likely to counter-argue dissimilar information and become more extreme as a result ([Taber and Lodge, 2006](#)), we do not find pronounced heterogeneous effects. Because we tested party-, ideology-, and political identity strength as relevant covariates, we are confident that these largely null effects are not due to any specific measurement.

In a similar vein, our treatment did little to influence participants' perceptions of the political system, in terms of their support for interparty compromise, attributing malevolent intentions to the outparty, or seeing the polity as polarized. It also did not shift their support for key democratic principles, such as freedom of speech or freedom of press (even though our pre-registered expectation was that those exposed to our treatment would be more inclined to ban their political opponents from the media and to have search engines and social media platforms avoid displaying or promoting articles from some media outlets). Relatedly, extreme dissimilar exposure also did not significantly worsen participants' well-being, even though – again – we predicted that it would make them feel more anxious or dissatisfied or increase negative or unhealthy behaviors. It is crucial to emphasize that apart from not being statistically significant, all the observed average effects are of a very small magnitude ($\pm .2$ and $\pm .1$ standard deviation changes).

The findings are a great contribution to the existing literature and theorizing on the potential negative effects of exposure to counter-attitudinal information. Contrary to some evidence, which finds exposure to opposing views to exacerbate attitude and affective polarization ([Levendusky, 2013](#); [Bail et al., 2018](#); [Garrett et al., 2014](#)), and in line with other existing work ([Guess and Coppock, 2018](#); [Wood and Porter, 2019](#)), we conclude that these

types of boomerang effect are the exception rather than the norm (and of a very small magnitude if they do emerge). Extending past work by incorporating people's evaluations of the outlets and accessed articles (based on both short surveys and also their open-ended thoughts and emotions), we conclude that this consistent lack of boomerang effects may be due to people's largely neutral or even positive reactions to the outlets and their content. We wanted to test the effect of an extreme counter factual and selected these 6 news sites because they are located at the extreme of each ideological side (with the exception of very minor fringe/niche sites). Nevertheless, despite representing the extreme of each ideological side, and despite often being vilified by one's partisan group, the partisans we studied often valued the information they consumed in them.

In addition, this study also makes a relevant contribution to the growing body of work that uses trace data to study people's attitudes and behavior. Rather than relying on a forced exposure experiment that shows people mock sites with counter-attitudinal news articles, we incentivized exposure, accounted for compliance, and exposed them to real news stories that actually appeared in news outlets of the opposing ideology. The trace data donated by the participants some weeks later additionally allowed us to assess compliance using precise behavioral data, complementing the self-reported compliance measures we collected. Furthermore, because we analyzed the rich qualitative data contributed by the participants in response to the news they read, we are able to shed important insight into participants' thoughts and feelings generated by extreme exposure to the other side, insight that was previously unavailable as virtually all existing work on boomerang effects relies on close-ended survey responses. It is designs like ours (combining online traces, systematic experimental treatments, self-reports at several time points, and unrestricted reactions to content) that are most apt to accurately portraying the existence (or rather lack thereof) of boomerang effects. At a time where key stakeholders such as social media companies ([Farr, 2018-10-16](#); [Wood and Ethan, 2020](#)), news organizations ([Goodman and Chen, 2010](#)), and governments ([Rendall, 2015](#); [Commission, 2013](#)) are designing policies decreasing or increasing exposure to dissimilar views in order to reduce mass polarization, we strongly believe that the findings reported here can help inform the decision-making process moving forward.

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Appendix A Policy attitudes questionnaire

On the scales below, please indicate whether your opinion is closer to the sentence on the left or the sentence on the right. If you are in the middle, don't know or are undecided, please chose the middle option. There are no wrong or right answers, we want to know what you think.

(13-point scales)

First, we have questions about the *economy*.

Economy 1	Government regulation of business is necessary to protect the public interest	Government regulation of business usually does more harm than good
Economy 2	Government should raise taxes to increase public services	Government should cut public services to cut taxes
Economy 3	Free trade has harmed the U.S. economy	Free trade has harmed the U.S. economy

Now we have questions about *climate change and the environment*:

Climate 1	Stricter environmental laws and regulations are worth the cost	Stricter environmental laws and regulations cost too many jobs and hurt the economy
Climate 2	There is solid evidence of the global warming caused by human activity	There is no solid evidence of global warming caused by human activity
Climate 3	To solve the nation's energy problems, the US should emphasize the development of alternative energy, such as wind and solar power	To solve the nation's energy problems, the US should emphasize the production of oil, gas and coal supplies

Now we have questions about *immigration*:

Immigration 1	Immigrants today strengthen our country because of their hard work and talents	Immigrants today are a burden on our country because they take our jobs, housing, and healthcare
Immigration 2	Government should allow unauthorized immigrants to remain in the United States and eventually qualify for U.S. citizenship, without penalties	Government should make all unauthorized immigrants felons and send them back to their home country
Immigration 3	American identity, norms and values have been enriched thanks to the presence of immigrants.	American identity, norms and values are being threatened because there are too many immigrants in the US.

Now we have questions about *gun control*:

Gun Control 1	The federal government should make it more difficult to buy a gun than it is now	The federal government should make it easier to buy a gun than it is now
Gun Control 2	Banning the sale of semi-automatic weapons will prevent mass shootings	Banning the sale of semi-automatic weapons will do nothing to prevent mass shootings
Gun Control 3	Carrying a concealed gun should not be allowed anywhere	Carrying a concealed gun should be allowed everywhere

Now we have questions about *the presidency of Donald Trump*:

Trump 1	Generally, I trust what Donald Trump says LESS than I trusted what previous presidents said while in office.	Generally, I trust what Donald Trump says LESS than I trusted what previous presidents said while in office.
Trump 2	Trump respects white people and men much more than he respects women and minorities	Trump respects all social groups equally, cares for people like me.
Trump 3	Trump's presidency has been bad for the economy.	Trump's presidency has been good for economy.

Appendix B Measures: Additional Information

B.1 Attribution of Malevolance

B.1.1 Item wording

Rows	Columns
1. I worry that Opposite Party are deliberately trying to hurt America.	1. Strongly disagree
2. Opposite Party are knowingly sabotaging the country.	2.
3. Opposite Party don't care about America.	3.
4. I believe Opposite Party genuinely wants what is best for America.	4. Neither
5. I trust Opposite Party to do what they think is best for America.	5. 6. 7. Strongly agree

B.1.2 Correlations

	Item 1	Item 2	Item 3	Item 4*	Item 5*
Item 1	1.00	0.75	0.70	0.54	0.40
Item 2	0.75	1.00	0.74	0.56	0.42
Item 3	0.70	0.74	1.00	0.55	0.37
Item 4*	0.54	0.56	0.55	1.00	0.70
Item 5*	0.40	0.42	0.37	0.70	1.00

*Note: *reversed items*

B.2 Support for compromise

B.2.1 Item wording

Left statement	Right Statement
1. Politicians need to hold to their principles no matter what	1. Politicians need to work together to get things done
2. Politicians should never compromise their values	2. Sometimes compromise is necessary when addressing major problems
3. I want politicians who hold their ground	3. I want politicians who work together
4. Principles should never be compromised	4. Principles should never block progress

B.2.2 Correlations

	Item 1	Item 2	Item 3	Item 4
Item 1	1.00	0.47	0.38	0.25
Item 2	0.47	1.00	0.37	0.24
Item 3	0.38	0.37	1.00	0.51
Item 4	0.25	0.24	0.51	1.00

B.3 Perceived polarization

B.3.1 Item wording

Rows	Columns
1. Democrats and Republicans hate each other.	1. Strongly disagree
2. The differences between Democrats and Republicans are too great to be reconciled.	2.
3. Americans are greatly divided when it comes to the most important values.	3.
4. Polarization in America is greater than ever before.	4. Neither 5. 6. 7. Strongly agree

B.3.2 Correlations

	Item 1	Item 2	Item 3	Item 4
Item 1	1.00	0.67	0.75	0.60
Item 2	0.67	1.00	0.73	0.67
Item 3	0.75	0.73	1.00	0.64
Item 4	0.60	0.67	0.64	1.00

B.4 Trust

B.4.1 Item wording

Rows	Columns
1. The federal government in Washington	1. Not trust at all
2. Police	2.
3. Scientists	3.
4. Reporter and journalists	4. Moderately
5. The U.S. Supreme Court	5.
6. University professors	6.
	7. Completely trust

B.4.2 Correlations

	Government	Police	Scientists	Journalists	Supreme Court	Professors
Government	1.00	0.40	0.22	0.37	0.51	0.27
Police	0.40	1.00	0.16	0.07	0.50	0.08
Scientists	0.22	0.16	1.00	0.51	0.30	0.64
Journalists	0.37	0.07	0.51	1.00	0.26	0.63
Supreme Court	0.51	0.50	0.30	0.26	1.00	0.27
Professors	0.27	0.08	0.64	0.63	0.27	1.00

B.5 Political identity strength

B.5.1 Item wording

Rows	Columns
1. I often think of myself as a Selected Party.	1. Strongly disagree
2. I consider myself a typical Selected Party	2. Disagree
3. I'm proud that I'm a Selected Party	3. Somewhat disagree
4. If someone said something bad about Selected Party, I feel as if they said something bad about me.	4. Neither agree nor disagree
	5. Somewhat agree
	6. Agree
	7. Strongly agree

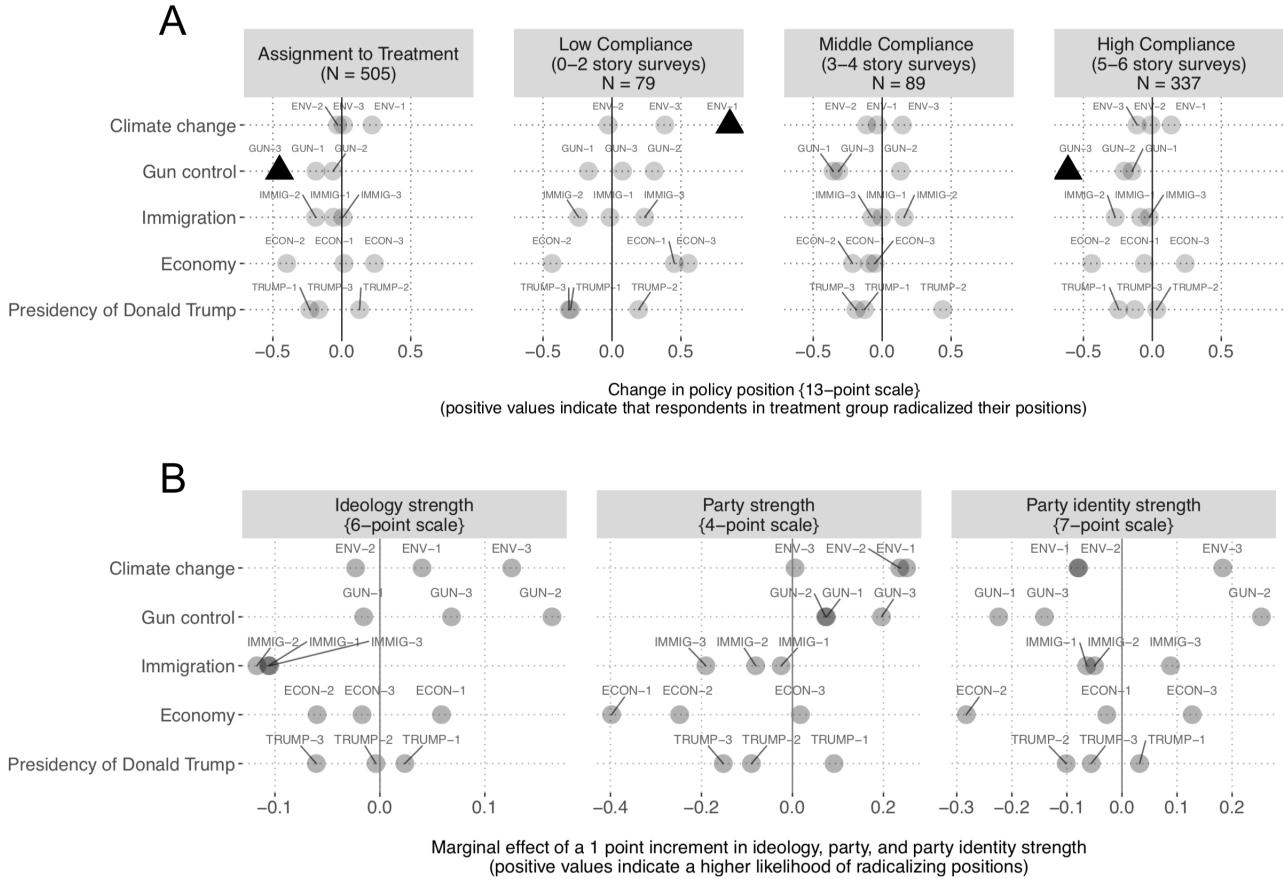
B.5.2 Correlations

	Item 1	Item 2	Item 3	Item 4
Item 1	1.00	0.63	0.76	0.50
Item 2	0.63	1.00	0.64	0.50
Item 3	0.76	0.64	1.00	0.56
Item 4	0.50	0.50	0.56	1.00

Appendix C Finer-grained Results

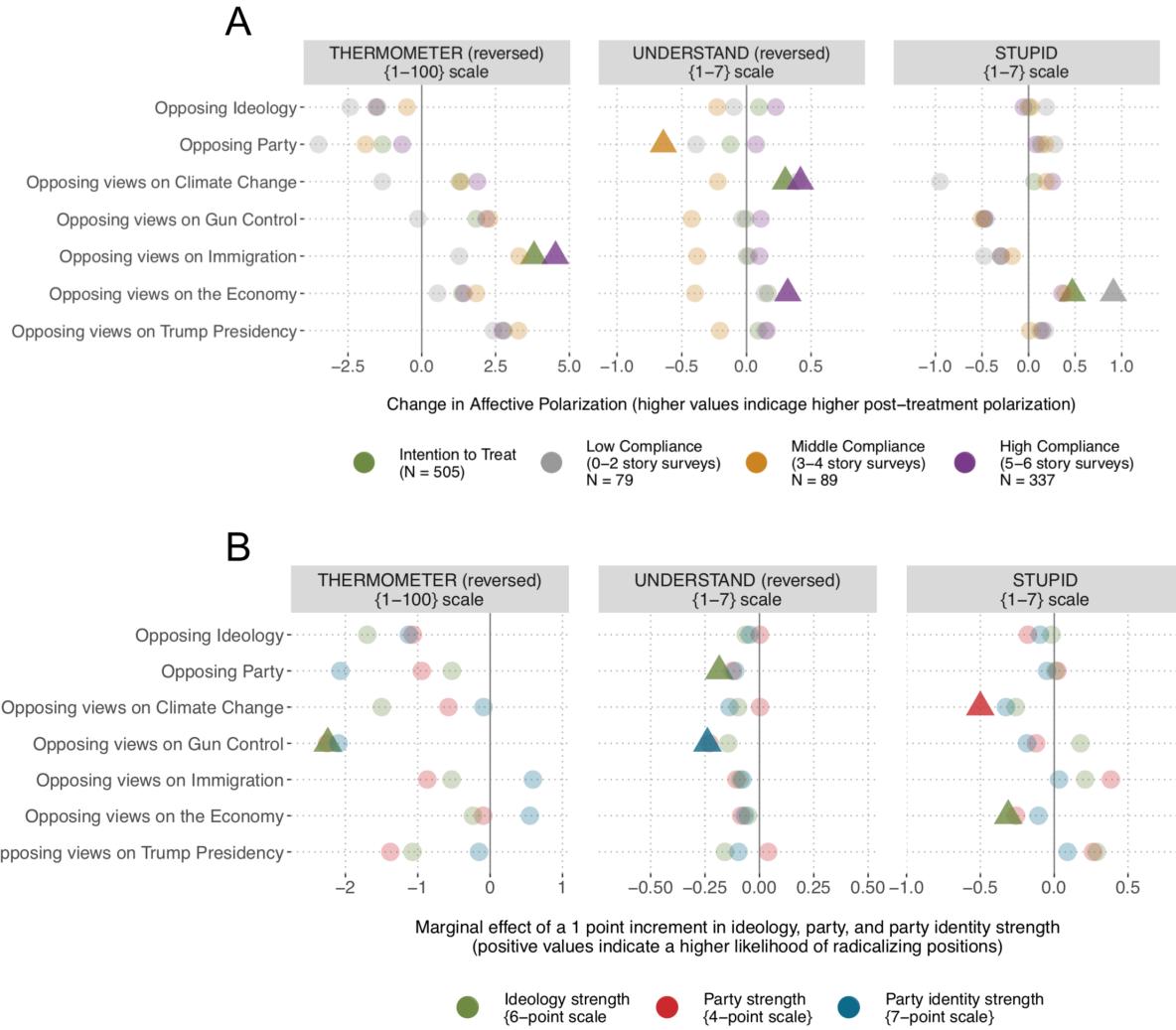
For the sake of simplicity, in the main analysis we aggregated several results. For example, when exploring changes in attitudes towards our five issues of interest (gun control, economy, immigration, presidency of Donald Trump, and climate change), we aggregated the respondents' policy positions on three sub-issue dimensions for each of the issues. Moreover, in the main analysis we did not report results for those who barely/moderately complied with the treatment. In this Appendix we include a more desegregated and complete version of Figures 3, 4, and 5. Compared to the figures in the main text, where the results are expressed in standard deviation changes, note that in here we report changes in the scale of the outcome variable.

Figure C1: (A) Linear models predicting changes in issue positions between pre and post test, as a function of assignment to treatment. (B) Linear models predicting the same issue position changes, as a function of an interaction between assignment to treatment and each theorized moderator. The bars indicate 95 and 90% confidence intervals.



*Note: Δ s indicate p -value < 0.05; ○ otherwise

Figure C2: (A) Linear models predicting changes in affective polarization between pre and post test, as a function of assignment to treatment. (B) Linear models predicting the same changes in affective polarization, as a function of an interaction between assignment to treatment and each of the theorized moderators. The bars indicate 95 and 90% confidence intervals.



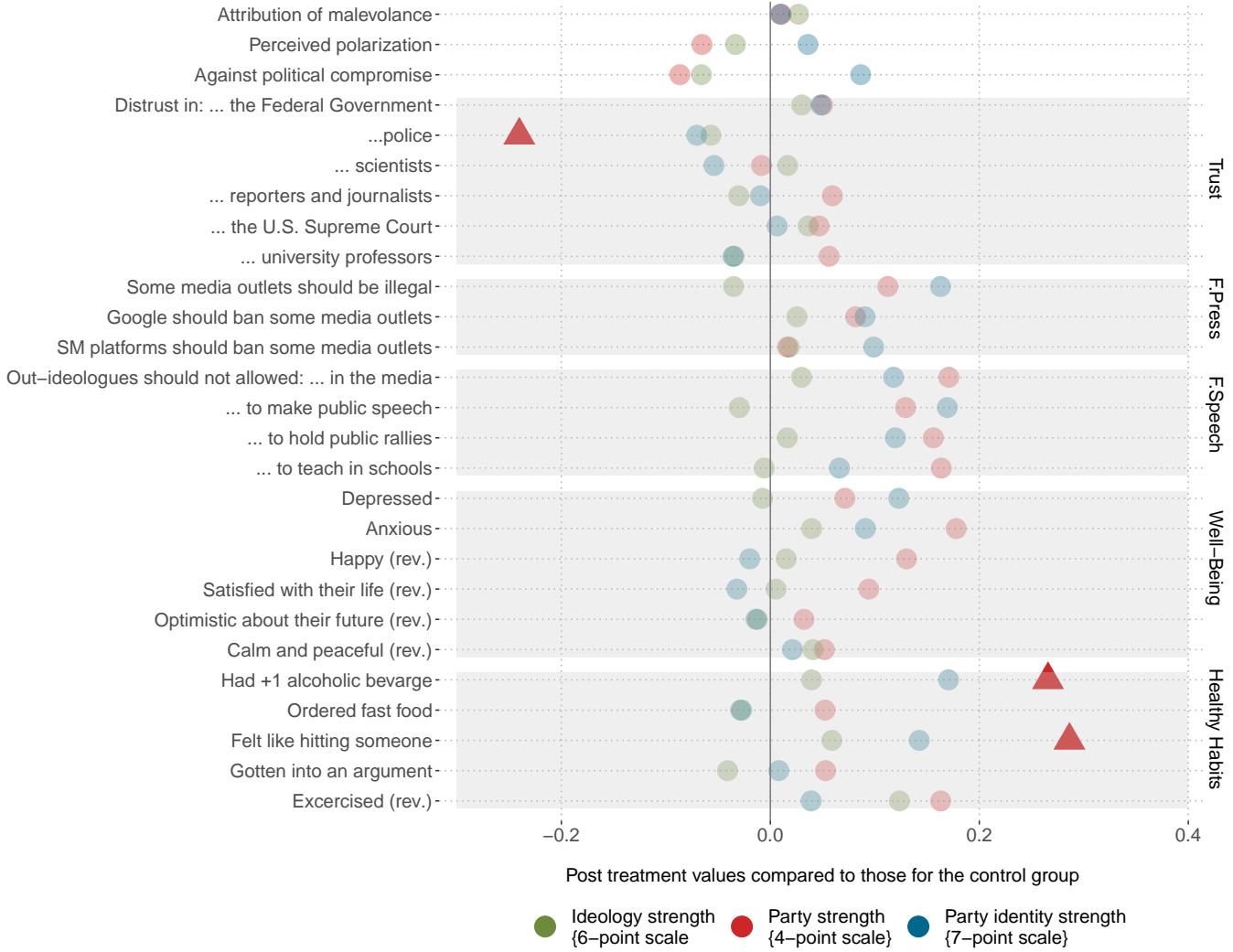
*Note: Δs indicate p -value < 0.05; \bigcirc otherwise

Figure C3: Linear models estimating the effect of exposure to extreme news sites of the opposing ideology on a variety of outcomes relevant for the understanding of political polarization. (B) Linear models predicting the same outcomes, as a function of an interaction of assignment to treatment and each theorized moderator. The bars indicate 95 and 90% confidence intervals.



*Note: Δs indicate p -value < 0.05 ; \circ otherwise

Figure C4: Linear models predicting the same outcomes in Figure C3, as a function of an interaction of assignment to treatment and each theorized moderator. The bars indicate 95 and 90% confidence intervals.



*Note: Δs indicate p -value < 0.05 ; \circ otherwise

Appendix D Moderator analysis including Party ID

Some research finds boomerang effects among Republicans/conservatives but not among Democrats/liberals (Bail et al., 2018). We did not hypothesize heterogeneous effects based on partisanship/ideology and so we did not include it as key moderator in the main analysis. However, in this appendix we include a 7-point self-reported variable measuring partisanship (*Conservatism*, ranging from *Strong Democrat* to *Strong Republican*) to our moderator analysis for attitude and affective polarization. We do not observe this moderator to have any effect.

Figure D1: Linear models predicting the issue position changes, as a function of an interaction between assignment to treatment and each moderator. The bars indicate 95 and 90% confidence intervals.

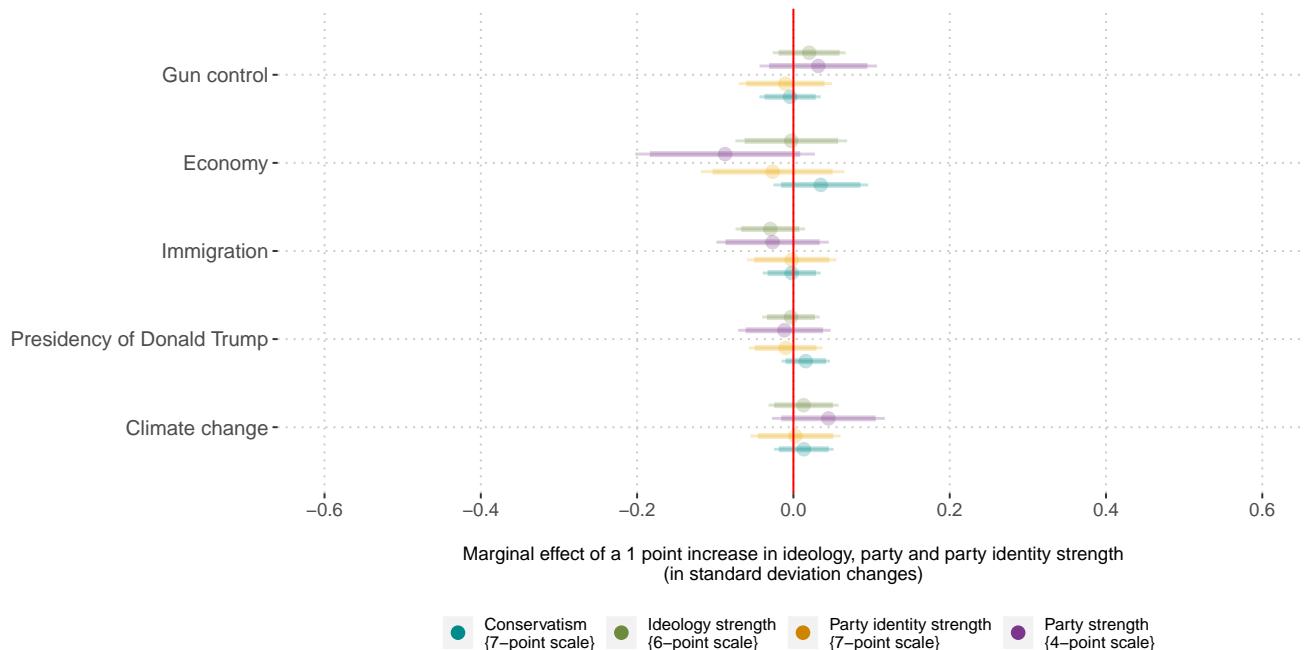


Figure D2: Linear models predicting the changes in affective polarization, as a function of an interaction between assignment to treatment and each of the moderators. The bars indicate 95 and 90% confidence intervals.

