INTERVENTIONS

Megastudy testing 25 treatments to reduce antidemocratic attitudes and partisan animosity

Jan G. Voelkel†, Michael N. Stagnaro†, James Y. Chu†, et al.

INTRODUCTION: Scholars, practitioners, and politicians have raised concerns about deepening partisan divisions and the health of American democracy. However, it remains unclear what strategies are most efficacious in reducing antidemocratic attitudes and partisan animosity in the American mass public. We tested the effects of 25 crowdsourced treatments on antidemocratic attitudes and partisan animosity. Moreover, we examine whether the same treatments were similarly impactful across different outcomes, or whether different treatments are needed to meaningfully reduce different outcomes.

RATIONALE: Understanding what general strategies efficaciously reduce antidemocratic attitudes and/or partisan animosity can support the development of effective intervention on these outcomes. We issued an open call to academics and practitioners, who submitted 252 ideas for treatments designed to reduce partisan animosity, support for undemocratic practices, and/or support for partisan violence. Working with an expert panel of researchers and practitioners, we selected 25 treatments to test, evaluating their effects in an online survey experiment (n = 32,059 participants) with a sample quota-matched to be representative of the population of Democrats and Republicans in the US on key demographics.

RESULTS: In preregistered analyses, we found that 23 of the 25 treatments significantly reduced partisan animosity [by up to 10.5 percentage points (pp)], six treatments significantly reduced support for undemocratic practices (by up to 5.8 pp), and five treatments significantly reduced support for partisan violence (by up to 2.8 pp). Efficacious strategies for reducing partisan animosity included highlighting sympathetic, politically dissimilar individuals and emphasizing common identities. Efficacious strategies for reducing support for undemocratic practices included correcting misperceptions of rival partisans' views and highlighting the risk of democratic collapse. Efficacious strategies for reducing support for partisan violence included correcting misperceptions of rival partisans' views and endorsements of democratic principles by political elites. Additionally, we find that several treatments reduced other attitudes that are potentially problematic for healthy democratic functioning—support for undemocratic candidates, opposition to bipartisan cooperation, social distrust, social distance, and biased evaluation of politicized facts. Analysis of patterns of covariance among 200 treatment effects suggests that some antidemocratic attitudes—support for undemocratic practices and partisan violence, in particular—are clearly distinct from partisan animosity. Yet, treatments that reduced partisan animosity also tended to reduce social distrust; social distance; opposition to bipartisan cooperation; biased evaluation of politicized facts; and, notably, support for undemocratic candidates.

CONCLUSION: We find that many treatments reduce partisan animosity. Additionally, several treatments reduced antidemocratic attitudes, filling an important gap in a literature that has focused almost exclusively on reducing partisan animosity. Further, we find that, in general, different treatments were most efficacious in reducing partisan animosity versus antidemocratic attitudes, which indicates that partisan animosity is not a unifying construct underpinning the psychology of polarization and democracy. Yet, we also find that partisan animosity is important because it is linked to a number of polarization-related constructs and to a critical threat to democratic societies—Americans' willingness to support undemocratic candidates. ∎

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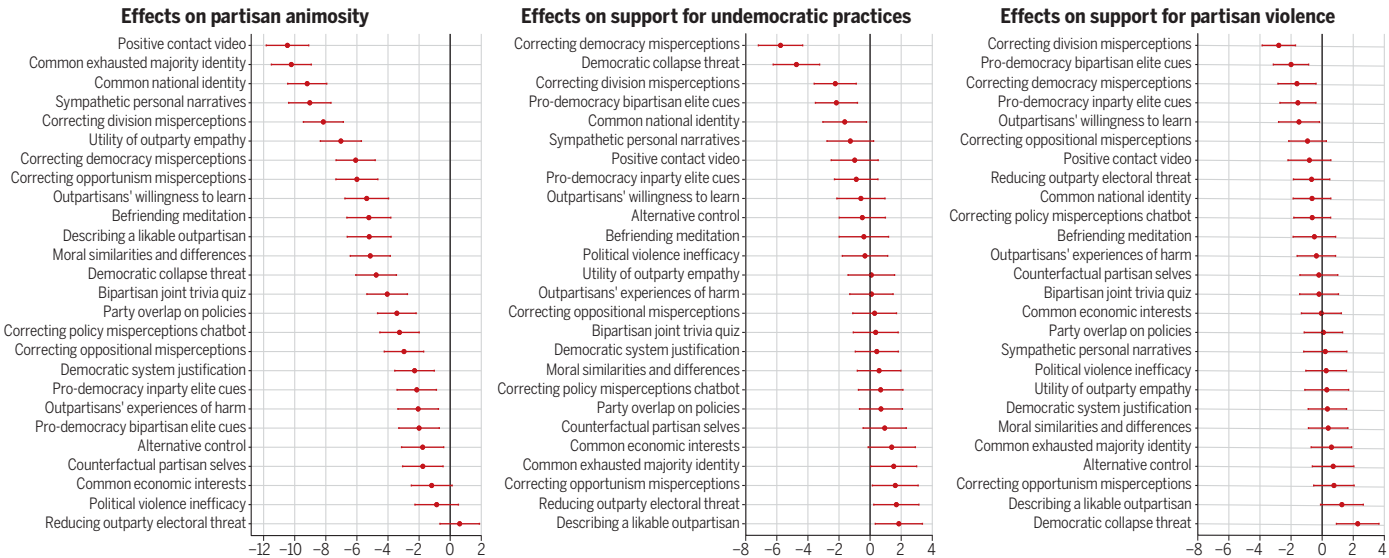
Megastudy identifies many efficacious treatments that reduce partisan animosity and/or antidemocratic attitudes. Treatment effects on partisan animosity (left), support for undemocratic practices (center), and support for partisan violence (right).

RESEARCH ARTICLE

INTERVENTIONS

Megastudy testing 25 treatments to reduce antidemocratic attitudes and partisan animosity

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Scholars warn that partisan divisions in the mass public threaten the health of American democracy. We conducted a megastudy (n = 32,059 participants) testing 25 treatments designed by academics and practitioners to reduce Americans' partisan animosity and antidemocratic attitudes. We find that many treatments reduced partisan animosity, most strongly by highlighting relatable sympathetic individuals with different political beliefs or by emphasizing common identities shared by rival partisans. We also identify several treatments that reduced support for undemocratic practices—most strongly by correcting misperceptions of rival partisans' views or highlighting the threat of democratic collapse—which shows that antidemocratic attitudes are not intractable. Taken together, the study's findings identify promising general strategies for reducing partisan division and improving democratic attitudes, shedding theoretical light on challenges facing American democracy.

The health of American democracy is under threat. Scholars have raised concerns about recent democratic backsliding [(1–4); but see (5)] and the destabilizing effects of deep partisan divisions (3, 4). Although the US clearly remains a democracy, featuring free and fair elections, many experts warn of the potential for the future decline of US democracy [(6); but see (5)]. These sentiments are echoed by the general public, the majority of whom are concerned about the country's political divisions (7) and see American democracy as at risk of failing (8).

Concerns about the health of American democracy are underpinned by evidence of public tolerance of violations of democratic principles. When surveyed, American partisans generally report supporting democratic principles (9), but a majority nonetheless report being willing to vote for candidates from their own party who have violated important democratic principles (10). Correspondingly, nearly 300 candidates who denied or questioned the legitimacy of the 2020 election won the Republican party nomination in the 2022 midterm elections, and more than 170 were eventually elected,

although no evidence for widespread election fraud exists (11).

Evidence also suggests that there are substantial partisan divisions in the US. Animosity toward rival partisans (i.e., "outpartisans")—often referred to as affective polarization—has risen steadily for decades in the mass public (12–14). Studies have linked partisan animosity to a range of outcomes, including poor mental health (15), avoidance of familial and romantic relationships (16, 17), workplace discrimination (18), associated intergroup conflicts (19), and weak collective responses to societal crises such as the COVID-19 pandemic (20).

Additionally, although Americans' average support for political violence is low in absolute terms (21), there is evidence suggesting that stronger norms prohibiting violent political engagement would be beneficial (22). A small but important group of Americans support the use of political violence to advance their goals (23, 24), threats of violence against politicians and civil servants have risen markedly in recent years (25), and more than 1000 Americans violently attacked the US Capitol to overturn the results of the 2020 presidential election.

In this work, we focus on identifying and testing treatments that can reduce antidemocratic attitudes and partisan animosity in the American mass public. Public opinion influences democratic stability, serving as a deterrent against elites' undemocratic behaviors (3, 4, 26). By rejecting undemocratic candidates at the ballot box, voters can create strong disincentives for politicians to engage in undemocratic practices (3, 27). Additionally, popularly endorsed norms prohibiting political violence serve as an important check against such violence (22, 23).

Concerns about partisan division—and, more recently, antidemocratic attitudes—in the American mass public have galvanized a large network of nonprofit and activist organizations (see supplementary materials, section S1) that seek to reduce political conflict among Americans, largely through grassroots action. Many political and economic elites and organizations have also expressed concern with partisan division and democratic stability (28), creating the potential for intervention through structural change, institutional interventions, or cues from political elites (29). Understanding the general strategies that most strongly influence individuals' partisan animosity and antidemocratic attitudes is helpful for either structural intervention (e.g., social media feed algorithms, elite rhetoric, and civics education) or more individual-focused interventions (e.g., activities of grassroots "bridging" organizations) because interventions implemented in the field will not shift public opinion if they do not generate relevant psychological processes.

To date, scholars and practitioners have focused on reducing Americans' partisan animosity [see (29) for a review]. Nonetheless, knowledge of how to reduce partisan animosity is scattered and often isolated by academic discipline. Many ideas developed and used by practitioners have not been discussed or tested by academics. Moreover, although research has identified several efficacious treatments to reduce partisan animosity, the use of different measures, research designs, and sampled populations makes it difficult to compare the efficacy of treatments (30, 31), and the reliability of existing findings is unclear in the context of widespread concerns about the replicability of social science research (32).

Comparatively less research has explored how to reduce antidemocratic attitudes in the American mass public. We define antidemocratic attitudes as support for actions that (i) undermine principles of electoral fairness, checks and balances, or civil liberties and/or (ii) involve violent political engagement (10). Although scholars often assume that reducing partisan animosity also reduces antidemocratic attitudes (33), recent research challenges that link (34, 35). For the few studies testing treatments directly targeting antidemocratic

attitudes (*22, 23, 36*), the same problems with knowledge coordination and commensuration complicate identifying the most efficacious strategies for reducing antidemocratic attitudes.

Our study is designed to address these gaps by answering several research questions. First, what treatments, if any, significantly reduce partisan animosity, support for undemocratic practices, and support for partisan violence? Second, what treatments most strongly reduce these outcomes, and what general strategies do those treatments use? Finally, when are the same treatments efficacious across different outcomes, and when are different treatments needed for different outcomes?

Below, we report the results of a large-scale megastudy [i.e., an experiment testing a large number of treatments simultaneously, using the same outcome measure(s), control condition(s), and sampled population; see (*31*)] designed to answer these questions. In it, we first conducted a broad canvassing of scholars' and practitioners' ideas for reducing partisan animosity and antidemocratic attitudes. We then identified the 25 treatments that we saw as most promising and conducted a head-to-head test of these treatments in a survey experiment conducted on a large sample (*n* = 32,059). Our study allowed us to consolidate and evaluate current knowledge regarding how to reduce these outcomes. Notably, we do not seek to identify treatments that—through a single, online exposure—would be likely to affect large and lasting reductions in antidemocratic attitudes and partisan animosity. Instead, we leverage the many treatments submitted to develop knowledge on what general strategies are more or less efficacious in shifting these important aspects of public opinion. Doing so, we can deepen researchers' and practitioners' understanding of the most important causal forces that shape

these outcomes, knowledge that can advance theory and inform effective intervention.

Methods

We issued an open call to crowdsource treatments designed to reduce partisan animosity, support for undemocratic practices, and/or support for partisan violence, promoting the call through emails, listservs, social media, and presentations to social scientists and practitioners working in nonprofit organizations and activist groups (supplementary materials, section S2.1). We incentivized submissions with authorship and cash prizes. To improve inclusivity, we offered targeted workshops, met individually with prospective submitters, and helped form several academic-practitioner collaborations. In all, we received 252 treatments from 419 submitters in 17 countries on four continents, including psychologists, political scientists, sociologists, economists, communication scholars, and more than 50 submissions from practitioners (supplementary materials, section S4). We recruited a panel of 29 academic and practitioner experts working on partisan division and/or democracy to help us select 25 promising treatments (supplementary materials, section S2.2).

Table 1 provides descriptions of the 25 tested treatments (supplementary materials, section S3.2). Three were based on previously published papers, 4 were based on unpublished working papers, and 18 had not appeared in previous research. Practitioners designed 3 treatments, academic-practitioner collaborations designed another 3, and academics designed the remaining 19.

Experimental participants were recruited from nonprobability opt-in internet panels. The sample was quota-matched to be representative of the population of US Democrats

and Republicans on key demographic benchmarks (*37*). Using a single between-subjects experiment with random assignment to treatments, consistent measures and control conditions, and the same sampled population allowed us to compare the relative efficacy of treatments. In addition to the preregistered outcomes of partisan animosity, support for undemocratic practices, and support for partisan violence, we also measured five other outcomes that we deemed potentially problematic for healthy democratic functioning—support for undemocratic candidates, opposition to bipartisan cooperation, social distrust, social distance, and biased evaluation of politicized facts (supplementary materials, sections S3.1 and S14).

Results

Figure 1 shows levels of partisan animosity, support for undemocratic practices, support for partisan violence, and the five other outcomes reported by control condition participants (*n* = 5601; see Table 2 for example items for all eight measures; all were measured on 0 to 100 scales; see supplementary materials, section S3.1, for complete lists of items). On average, these participants reported high levels of partisan animosity [mean (*M*) = 68.1, SD = 20.5] and moderate levels of social distrust (*M* = 53.5, SD = 27.7), support for undemocratic candidates (*M* = 52.5, SD = 23.6), and biased evaluations of politicized facts (*M* = 51.6, SD = 21.5). Preferences for social distance from outpartisans (*M* = 30.7, SD = 27.1), support for undemocratic practices (*M* = 26.5, SD = 23.2), opposition to bipartisan cooperation (*M* = 20.9, SD = 21.7), and support for partisan violence (*M* = 10.8, SD = 20.3) were lower in absolute terms, although levels of these attitudes could still challenge healthy democratic functioning

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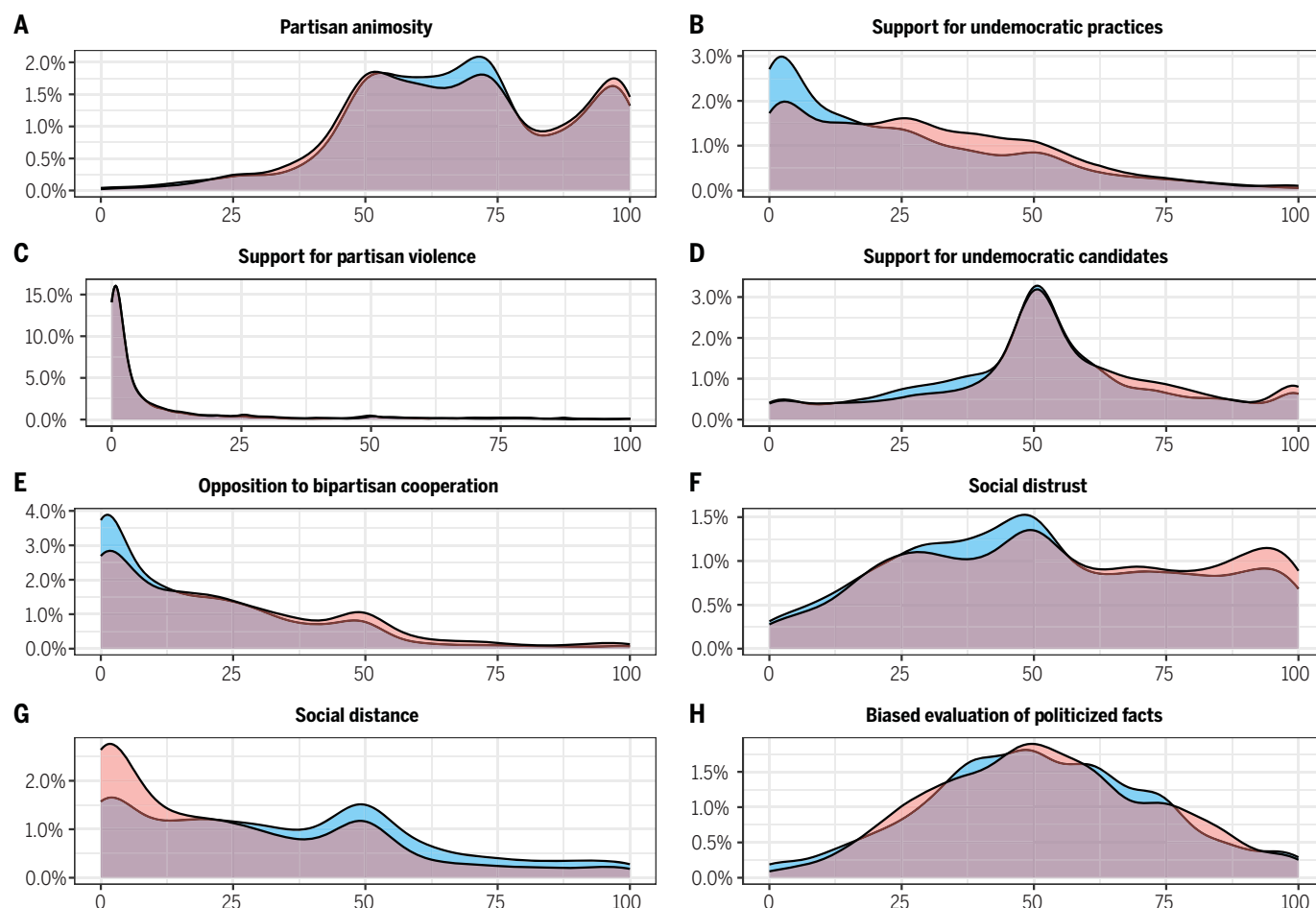†These authors contributed equally to this work.

Fig. 1. American partisans expressed concerning levels of attitudes that are potentially problematic for healthy democratic functioning. (A to H) Participants in the null control condition reported high levels of partisan animosity ($n = 5552$; $M = 68.1$) (A), low levels of support for undemocratic practices ($n = 5556$; $M = 26.5$) (B), low levels of support for partisan violence ($n = 5556$; $M = 10.8$) (C), moderate levels of support for undemocratic candidates ($n = 5463$; $M = 52.5$) (D), low levels of opposition to bipartisan cooperation ($n = 5402$; $M = 20.9$) (E), moderate levels of social distrust ($n = 5405$; $M = 53.5$) (F), low levels of preferences for social distance from outpartisans ($n = 5401$; $M = 30.7$) (G), and moderate levels of biased evaluations of politicized facts ($n = 5388$; $M = 51.6$) (H). The measure for each variable is described in the supplementary materials, section S0.3. All variables range from 0 to 100. Ranges on the y axes differ for each variable. Partisan differences were modest, as shown by the large overlaps in distributions between Democrats (blue) and Republicans (red) (overlaps shown in purple). Democrats reported higher levels of support for partisan violence and social distance. Republicans reported higher levels of support for undemocratic practices, support for undemocratic candidates, opposition to bipartisan cooperation, and social distrust (supplementary materials, section S5). Levels underscore the importance of identifying efficacious treatments to reduce these potentially problematic attitudes.

by eroding norms that prohibit undemocratic practices and political violence. Consistent with prior research (*9*, *10*), we find that American partisans generally oppose undemocratic practices yet are willing to vote for candidates from their own party (i.e., "inparty" candidates) who engage in them.

Republicans expressed significantly more support for undemocratic practices and candidates, opposition to bipartisan cooperation, and social distrust compared with Democrats, whereas Democrats expressed significantly more support for partisan violence and a stronger desire for social distance from outpartisans. More strongly identified partisans reported significantly higher levels of seven of the eight outcomes. Because previous research has iden-

tified liberal-conservative asymmetries in antidemocratic tendencies (*38*), we also inspected correlations with ideological self-placement. Conservatism was positively and significantly correlated with partisan animosity, support for undemocratic practices, support for undemocratic candidates, opposition to bipartisan cooperation, social distrust, and biased evaluation of politicized facts. At the same time, conservatism was negatively correlated with social distance and support for partisan violence (for further descriptive analyses, see supplementary materials, section S5).

Reducing partisan animosity

In preregistered analyses, we found that 23 out of the 25 treatments significantly reduced par-

tisan animosity [Fig. 2A and table S17; see also (*39*)], which was also the most common outcome that submitters reported targeting (supplementary materials, section S4). The magnitude of these effects was substantively meaningful. Political scientists have used feeling thermometers to track partisan animosity since the 1970s, finding that American partisans' average animosity toward outpartisans increased by 21.9 percentage points (pp) between 1978 and 2016, or ~0.6 pp per year (*40*). On average, the 25 treatments in our study reduced partisan animosity by 5.0 pp, equivalent to ~8 years of the increase in partisan animosity seen in recent decades.

As an additional measure of partisan animosity, we collected a real-stakes, behavioral

Table 1. The 25 treatments. The treatment column has the names of the treatments that we use throughout the manuscript to identify them. The description column summarizes each treatment. More information about each treatment (including the submitting authors) can be found in the supplementary materials, section S3.2.

Treatment	Description
Befriending meditation	Participants heard an audio track that guided them through a befriending meditation. The speaker emphasized treating oneself well and being kind to others.
Bipartisan joint trivia quiz	Participants played a collaborative trivia game in which they would perform better if they used answers shared by their partner with a different partisan identity.
Correcting democracy misperceptions	Participants were asked to what extent most outpartisans support undemocratic actions and were then told the true extent of this support (quite low) using previously collected survey data.
Correcting division misperceptions	Participants watched a video featuring several Democrats and Republicans learning that the other side is less extreme on immigration and outparty dehumanization than they expected.
Correcting opportunism misperceptions	Participants estimated to what extent outpartisans would accept extreme negative events (e.g., many US COVID-19–related deaths) to increase the odds of winning the next election, then received feedback that the average outpartisan would not accept such events for electoral advantage.
Correcting oppositional misperceptions	Participants estimated how many outpartisans would oppose state legislative actions that could benefit their own party. Participants got feedback on how the average outpartisan responded.
Correcting policy misperceptions chatbot	Participants interacted with a chatbot, guessing where Democrats and Republicans fall on various political issues, then received feedback on how far apart Democrats and Republicans truly are.
Common economic interests	Participants watched a video suggesting that economic interests unite most Americans across political divides and that the superrich are a common enemy of most Democrats and Republicans.
Common exhausted majority identity	Participants read that news media creates polarization to maximize its audience. Participants read that most Democrats and Republicans are part of an exhausted majority that rejects polarization.
Common national identity	Participants read that democracy has been crucial to America's success. Participants read that Democrats and Republicans share a national identity that entails supporting democracy and rejecting violence.
Counterfactual partisan selves	Participants read that environments and experiences shape people's political beliefs. Participants gave their views on divisive issues and then answered the questions again imagining that they were born into different circumstances.
Democratic collapse threat	Participants watched a video of civic unrest and police repression in several countries where democracy collapsed and saw scenes from the 2021 US Capitol riot. Participants then answered questions about how they could protect democracy.
Democratic system justification	Participants read an article about how the US and Americans never abandon the principles that made America great. Participants read that Americans stay faithful to the principles of democracy, civility, and respect.
Describing a likable outpartisan	Participants wrote about a person from the other party that they like and respect.
Moral similarities and differences	Participants read about moral foundation theory, which argues that we all share the same six moral foundations. Participants read that people use these moral foundations differently on different issues.
Outpartisans' experiences of harm	Participants read that outpartisans hold their views because of personal experiences of suffering. For example, Republican participants read a story of a person who is antigun because their friend was murdered by someone who obtained a gun without a proper background check.
Outpartisans' willingness to learn	Participants read a message and survey responses from an outpartisan who indicated a willingness to learn about and better understand opposing views. Participants then responded to the message.
Party overlap on policies	Participants answered questions about their views on eight policies. After each question, they are shown the high overlap in the views of Democrats and Republicans on the issue.
Political violence inefficacy	Participants read a news article about how nonviolent protests are historically more effective than violent protests in bringing about social change.
Positive contact video	Participants watched a video showing pairs of British people bonding with one another despite having political disagreements. Participants who answered questions about the video correctly could share the video with someone from the other party.
Pro-democracy inparty elite cues	Participants read an op-ed (i) quoting a leader of their party rejecting violence and antidemocratic actions and (ii) reporting that more than 90% of inpartisans reject violence and antidemocratic actions.
Pro-democracy bipartisan elite cues	Participants watched a campaign ad from the 2020 Democratic and Republican candidates for Utah governor. Both candidates endorsed accepting the results of the election and a peaceful transfer of power.
Reducing outpartisan electoral threat	Participants read about how their party is dominating American politics now and will for the foreseeable future.
Sympathetic personal narratives	Participants watched five short videos of people talking about what others may miss about them. Participants then watched another animated video about how democracy allows people with different views to work together.
Utility of outparty empathy	Participants read that empathizing with people with different political beliefs can lead one's own side to be more persuasive and liked.

measure of animosity toward outpartisans, in which participants were given 50 cents to divide with a stranger who supported the other party. In the null control condition, participants gave, on average, 17.6 cents to outpartisans. On average, the 25 treatments in our study increased this amount by 2.2 cents, which translates to a 4.4 pp increase—a similar effect size as for the feeling thermometer. Treatment effects for the feeling thermometer were highly correlated ($r_{\text{effect size}} = 0.83$) with the treatment effects for behavior in the dictator game. Consistent with this finding and our preregistration, the results presented below average the two as a composite measure of partisan animosity.

What strategies were used by the most efficacious treatments for reducing partisan animosity? Here, we define a strategy as the primary general causal mechanism used by a specific, tested treatment. Two key strategies were used by the four treatments with the largest effect sizes. The first strategy involved highlighting relatable, sympathetic individuals with different political beliefs from the participant. For example, positive contact video (−10.47 pp, $P < 0.001$, significantly larger effect than 88% of other treatments) [41] presented a video depicting interactions between pairs of people with different political orientations, nonetheless demonstrating mutual respect for, and connecting with, one another. Similarly, sympathetic personal narratives (−9.03 pp, $P < 0.001$, larger than 83% of treatments) presented a video with several Americans from diverse backgrounds sharing relatable views that people might not expect them to hold.

The second strategy involved highlighting identities connecting people across party lines (i.e., cross-partisan identities). For example, common exhausted majority identity (−10.22 pp, $P < 0.001$, larger than 88% of treatments) argued that Democrats and Republicans jointly represent an exhausted majority that has been served polarizing content by the mass media and is tired of political conflict. Similarly, common national identity (−9.20 pp, $P < 0.001$, larger than 83% of treatments) used multiple strategies but most of all emphasized that Democrats and Republicans share a common national identity as Americans.

Other strategies were associated with smaller effect sizes or null effects, including (i) highlighting policy similarities between Democrats and Republicans (correcting policy misperceptions chatbot: −3.26 pp, $P < 0.001$, larger than 12% of treatments; and party overlap on policies: −3.43 pp, $P < 0.001$, larger than 17% of treatments) and (ii) providing reasons why outpartisans have the party identities that they do (counterfactual partisan selves: −1.76 pp, $P = 0.004$, larger than 4% of treatments; outpartisans' experiences of harm: −2.06 pp, $P = 0.001$, larger than 4% of treatments; and moral similarities and differences: −5.14 pp, $P < 0.001$,

larger than 46% of treatments). Ameliorating perceptions of outpartisans as threatening by highlighting the electoral supremacy of the inparty (reducing outparty electoral threat: 0.61 pp, $P = 0.827$, larger than 0% of treatments) or by highlighting the political ineffectiveness of violent protests (political violence inefficacy: −0.87 pp, $P = 0.112$, larger than 0% of treatments) did not reduce partisan animosity.

Reducing support for undemocratic practices

In preregistered analyses, we found that six treatments significantly reduced support for undemocratic practices (Fig. 2B and table S18). Three strategies were used by the five treatments with the largest effect sizes. The first is correcting exaggerated stereotypes of outpartisans. This strategy is illustrated by correcting democracy misperceptions (−5.76 pp, $P < 0.001$, larger than 96% of treatments), which presented participants with survey data correcting partisans' inflated perceptions of levels of support for undemocratic practices among outpartisans. Another efficacious misperception correction treatment (correcting division misperceptions: −2.24 pp, $P = 0.001$, larger than 62% of treatments) showed a video of partisans' reactions upon learning that they had overestimated how much outpartisans dehumanized them.

The second efficacious strategy—highlighting the potentially drastic and violent consequences of democratic collapse—is illustrated by democratic collapse threat (−4.74 pp, $P < 0.001$, larger than 96% of treatments). This treatment showed participants a video of civic unrest and police repression in several countries (e.g., Venezuela, Russia, or Turkey) experiencing some degree of democratic collapse before concluding with imagery of the 6 January 2021 US Capitol attack, warning Americans not to be complacent about the risk of incremental democratic backsliding precipitating democratic collapse. A third efficacious strategy involved endorsements of democratic principles from party elites. Pro-democracy bipartisan elite cues (−2.17 pp, $P = 0.001$, larger than 62% of treatments) featured a short film in which the Democratic and Republican parties' 2020 Utah gubernatorial candidates discussed their common commitment to honor the results of the upcoming 2020 election.

We also gained insights on what treatments did not reduce support for undemocratic practices. Four of 25 treatments (common exhausted majority identity, reducing outparty electoral threat, describing a likable outpartisan, and correcting opportunism misperceptions)—including three that successfully reduced partisan animosity—backfired, actually increasing support for undemocratic practices. Follow-up analyses found that backfire effects were driven by different political groups (e.g., conservative Republicans or conservative Democrats) for

different treatments, which suggests that these effects were likely not produced by a single causal dynamic (table S85).

In addition to these three preregistered outcomes, we also measured support for undemocratic candidates—an important antidemocratic attitude given the role that citizens play in checking elite democratic backsliding at the ballot box [3, 4]. We found strong correlations between the magnitude of causal effects of the 25 treatments on support for undemocratic practices and candidates ($r_{\text{effect size}} = 0.75$), suggesting that the same treatments tended to reduce each outcome. Accordingly, the two most efficacious strategies for reducing support for undemocratic practices—correcting exaggerated stereotypes of outpartisans and highlighting the potential consequences of democratic collapse—were also the most efficacious in reducing support for undemocratic candidates (see table S20 and Discussion section below for further analysis).

Reducing support for partisan violence

In preregistered analyses, we found that five treatments significantly reduced support for partisan violence [Fig. 2C and table S19; see also [42]]. Two strategies, both of which also reduced support for undemocratic practices, were used by the four treatments with the largest effect sizes. The first strategy—correcting exaggerated stereotypes of outpartisans—was illustrated by two treatments: correcting division misperceptions (−2.79 pp, $P < 0.001$, larger than 83% of treatments) and correcting democracy misperceptions (−1.62 pp, $P = 0.005$, larger than 42% of treatments).

The second strategy is endorsements of democratic principles by political elites. This strategy was illustrated by pro-democracy bipartisan elite cues (−2.00 pp, $P < 0.001$, larger than 58% of treatments) and pro-democracy inparty elite cues; the latter featured an article in which an inparty leader endorsed nonviolent political engagement (−1.56 pp, $P = 0.004$, larger than 42% of treatments).

Notably, the only treatment that backfired by increasing support for partisan violence (democratic collapse threat: 2.29 pp, larger than 0% of treatments) was among the treatments that most efficaciously reduced support for undemocratic practices and candidates. Further analyses indicated that this backfire effect was driven by the most conservative Republican participants (table S85), who may have reacted to the treatment using footage from the January 6th riots, which many Republicans perceive to be a legitimate protest [43].

Durability

We tested the durability of experimental effects ~2 weeks later in a preregistered follow-up survey ($n = 8644$ participants; supplementary materials, section S9). Of the 23 treatments
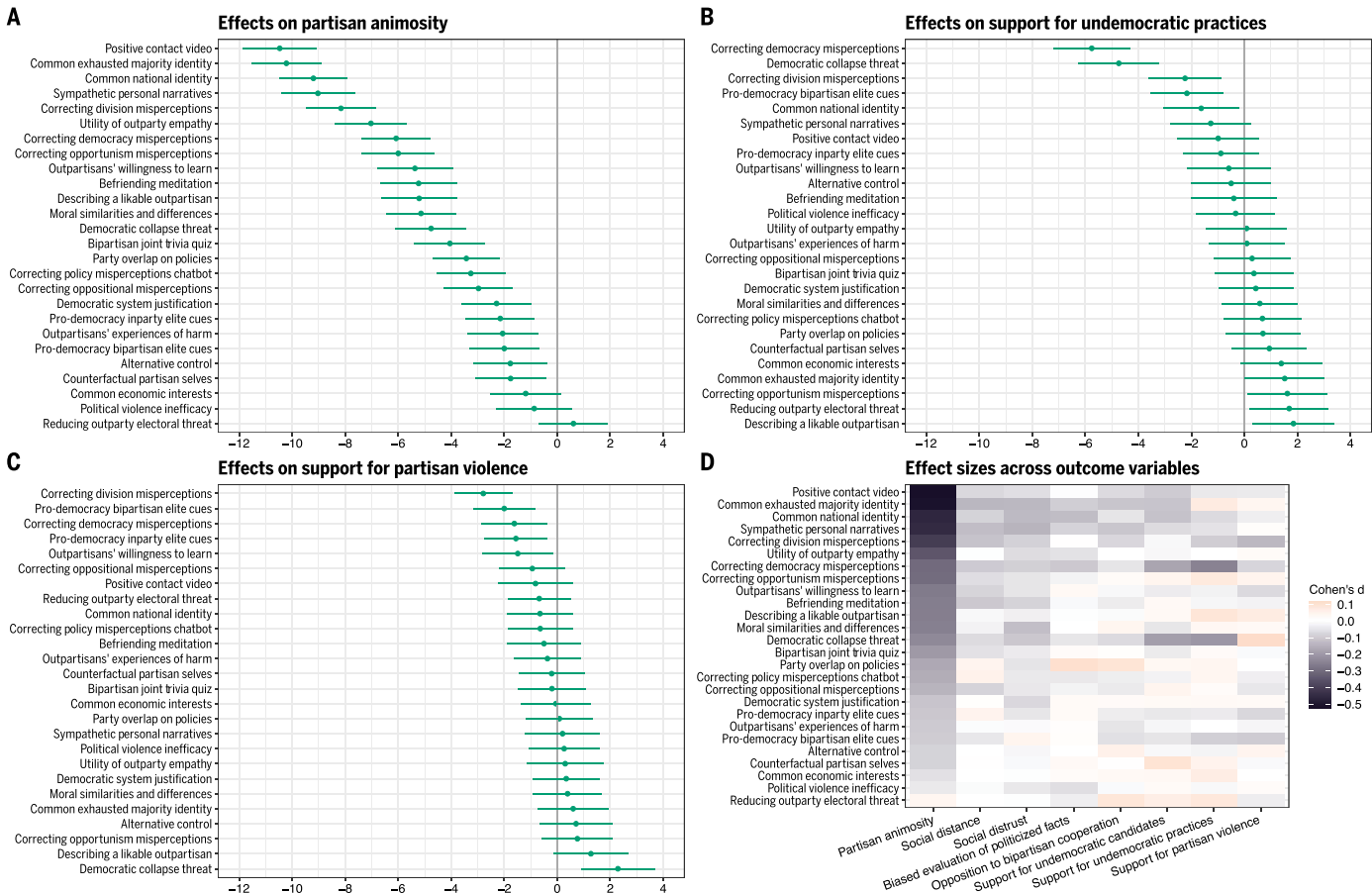
Fig. 2. Megastudy identifies many efficacious treatments that reduce partisan animosity, support for undemocratic practices, and/or support for partisan violence. (**A**) Twenty-three treatments significantly reduced partisan animosity (*n* = 31,835), most efficaciously by presenting relatable, sympathetic individuals with different political beliefs or highlighting a common, cross-partisan identity. (**B**) Six treatments significantly reduced support for undemocratic practices (*n* = 31,856), most efficaciously by correcting misperceptions about how antidemocratic outpartisans are or highlighting the potentially disastrous consequences of democratic collapse. (**C**) Five treatments significantly reduced support for partisan violence (*n* = 31,837), for example by correcting misperceptions that outpartisans dehumanize political opponents or providing pro-democracy elites cues. (A) to (C) show unstandardized regression coefficients and 95% confidence intervals for the effects of the 25 treatments and the alternative control condition, relative to the null control condition, based on preregistered regression models (tables S17 to S19). All outcomes range from 0 to 100. Treatments are sorted in order of effect size. Error bars represent 95% confidence intervals. We preregistered using one-sided *P* values, so significance levels cannot be concluded from whether the confidence interval includes zero. (**D**) Efficacy of treatments extended to other outcomes, including support for undemocratic candidates (six significant effects, *n* = 31,470), opposition to bipartisan cooperation (six significant effects, *n* = 31,239), social distrust (11 significant effects, *n* = 31,247), social distance (12 significant effects, *n* = 31,228), and biased evaluation of politicized facts (five significant effects, *n* = 31,186). (D) shows standardized effect sizes (Cohen's *d*) for all 25 treatments and the alternative control condition, relative to the null control condition, for the eight outcomes (tables S17 to S24). Identifying many efficacious treatments for several antidemocratic attitudes fills an important gap in the literature that has previously focused almost exclusively on reducing partisan animosity.

that significantly reduced partisan animosity, we tested 10 treatments, including the seven with the largest initial effect sizes. In preregistered analyses, we find that six treatments still significantly reduced partisan animosity 2 weeks later.

There was limited evidence for durable effects for antidemocratic attitudes. In preregistered analyses testing the effects of treatments on support for undemocratic practices and partisan violence in the 2-week follow-up survey, only one of the 10 initial treatment effects that we tested endured. Beyond the preregistered outcomes, we found some durable sig-

nificant effects for the other five outcomes (range: 0 to 3 durable effects per outcome). In particular, two treatments continued to reduce support for undemocratic candidates. Among treatments that had a significant effect in the main study, estimated effect sizes of the treatments 2 weeks later were 32%, 7%, 53%, and 42% the magnitude of the original effect size for partisan animosity, support for undemocratic practices, support for partisan violence, and support for undemocratic candidates, respectively.

Taken together, these results suggest that larger treatment effects were more likely to endure. However, all effect sizes showed sub-

stantial decay after 2 weeks. We return to implications of these results below in the Discussion section.

Relationships between outcomes

Finally, we leverage the distinctive structure of this study to shed light on the psychology underlying the polarization and democracy-related outcomes that we studied. Because our study features 25 different treatments, we are able to analyze how the different outcomes that we measured respond to this diverse set of treatments, gaining theoretical insight on deeper causal structure linking these outcomes. If two

outcomes tend to covary in similar ways in response to a large and diverse set of treatments, then it is likely that these variables are either causally linked, or even conceptually overlapping, with one another. If there is little or no overlap in how two variables respond to an array of different treatments, it suggests that the variables are conceptually distinct and causally unrelated. This analysis may also provide practical insight by illuminating which outcomes are likely to move in response to the same field interventions and which likely must be targeted by independent interventions.

Figure 3B shows the correlations of effect sizes on outcomes in response to the 25 treatments, and Fig. 3A presents a network visualization in which outcome variables with more positively correlated effect sizes in response to treatments are presented closer to one another, connected by a stronger network tie. In Fig. 3A, partisan animosity sits at the center of a cluster of outcomes that responded to treatments similarly, including preferences for social distance from outpartisans, generalized social distrust, and biased evaluation of politicized facts. This cluster fits with intuition and prior research. For example, it makes sense that treatment effects on animosity toward out-

partisans, a large swath of the US population, would be closely related to trust in strangers more generally ($r_{\text{effect size}}$ = 0.73). This result suggests that partisan animosity may increase societal divisions by eroding generalized trust in others, which scholars have argued is important for sustaining cooperation and market exchange (44–46). Additionally, partisan animosity and preferences for social distance from outpartisans responded similarly to treatments ($r_{\text{effect size}}$ = 0.71), which is consistent with prior work (47). This result suggests that partisan animosity may increase divisions by increasing political self-segregation (48, 49). Finally, we find that treatment effects on partisan animosity were correlated with treatment effects on biased evaluation of politicized facts ($r_{\text{effect size}}$ = 0.45), outcomes that prior work has found are correlated (50) and that our results suggest may be linked causally.

A common perspective is that partisan animosity drives antidemocratic attitudes, such that treatments reducing partisan animosity would also reduce these attitudes [see (33), table 1 of (34), and supplementary table 1 of (35)]. We surveyed both academics (n = 98) and practitioners (n = 51) working in the field of polarization, asking them to forecast the

treatment effects that we would observe in this study (supplementary materials, section S10). Consistent with the common perspective, forecasts indicated that both groups expected that treatment effects on partisan animosity would be highly correlated with treatment effects on support for undemocratic practices (academics: $r_{\text{forecasted effect size}}$ = 0.46; practitioner: $r_{\text{forecasted effect size}}$ = 0.50) and support for partisan violence (academics: $r_{\text{forecasted effect size}}$ = 0.46; practitioners: $r_{\text{forecasted effect size}}$ = 0.51). Forecasted treatment effects on support for undemocratic practices were also correlated with forecasted treatment effects on support for partisan violence (academics: $r_{\text{forecasted effect size}}$ = 0.54; practitioners: $r_{\text{forecasted effect size}}$ = 0.73).

By contrast, however, we find that treatment effects were much less strongly correlated for these constructs. Treatment effects on partisan animosity and support for undemocratic practices correlated at $r_{\text{effect size}}$ = 0.25; effects on partisan animosity and support for partisan violence correlated at $r_{\text{effect size}}$ = −0.02; and effects on support for undemocratic practices and support for partisan violence correlated at $r_{\text{effect size}}$ = 0.27 [see also (51)]. These results indicate that partisan animosity is not a unitary construct underpinning the psychology of

Table 2. The eight outcome variables. The outcomes were selected as important variables relating to the psychology underlying polarization and democracy. The first column provides the name of each outcome variable. The second column provides the definition of each outcome variable. The third column provides item(s) illustrating how each outcome variable was measured. Items that are excerpted are indicated with an asterisk (*). The complete wording of these and all other items is in the supplementary materials, sections S0.3 and S3.1. Variables that were specified as targets for submitters and preregistered as primary outcome variables are indicated with a dagger symbol (†). Reliability estimates for all outcome variable measures are provided in table S2.

| Outcome variable	Definition	Example item(s)
Partisan animosity†	Dislike for opposing partisans	…How would you rate [Democrats/Republicans]?…Very cold or unfavorable feeling…No feeling…Very warm or favorable feeling*. …How many cents (if any) will you give to the [Democratic/Republican] participant?*
Support for undemocratic practices†	Support for actions by inpartisans that violate principles of electoral fairness, checks and balances, and/or civil liberties	[Republicans/Democrats] should not accept the results of elections if they lose.
Support for partisan violence†	Support for inpartisans using violence against outpartisans	How much do you feel it is justified for [Republicans/Democrats] to use violence if the [Democratic/Republican] party wins more races in the next election?
Support for undemocratic candidates	Willingness to vote for inparty candidates who have violated principles of electoral fairness, checks and balances, and/or civil liberties	How would you vote if you learned that the [Republican/Democratic] candidate said that [Republicans/Democrats] should not accept the results of elections they lose?
Opposition to bipartisan cooperation	Resistance to bipartisan collaboration	To what extent would you like to see Democratic and Republican elected representatives work together?
Social distrust	Distrust of people in general	Generally speaking, would you say that most people can be trusted, or that you need to be very careful in dealing with people?
Social distance	Resistance to interpersonal contact with outpartisans	How comfortable are you having close personal friends who are [Democrats/Republicans]?
Biased evaluation of politicized facts	Skepticism about facts that favor the worldview of the outparty	[Joe Biden/Donald Trump] was lawfully elected president in the [2020/2016] election against [Donald Trump/Hillary Clinton].
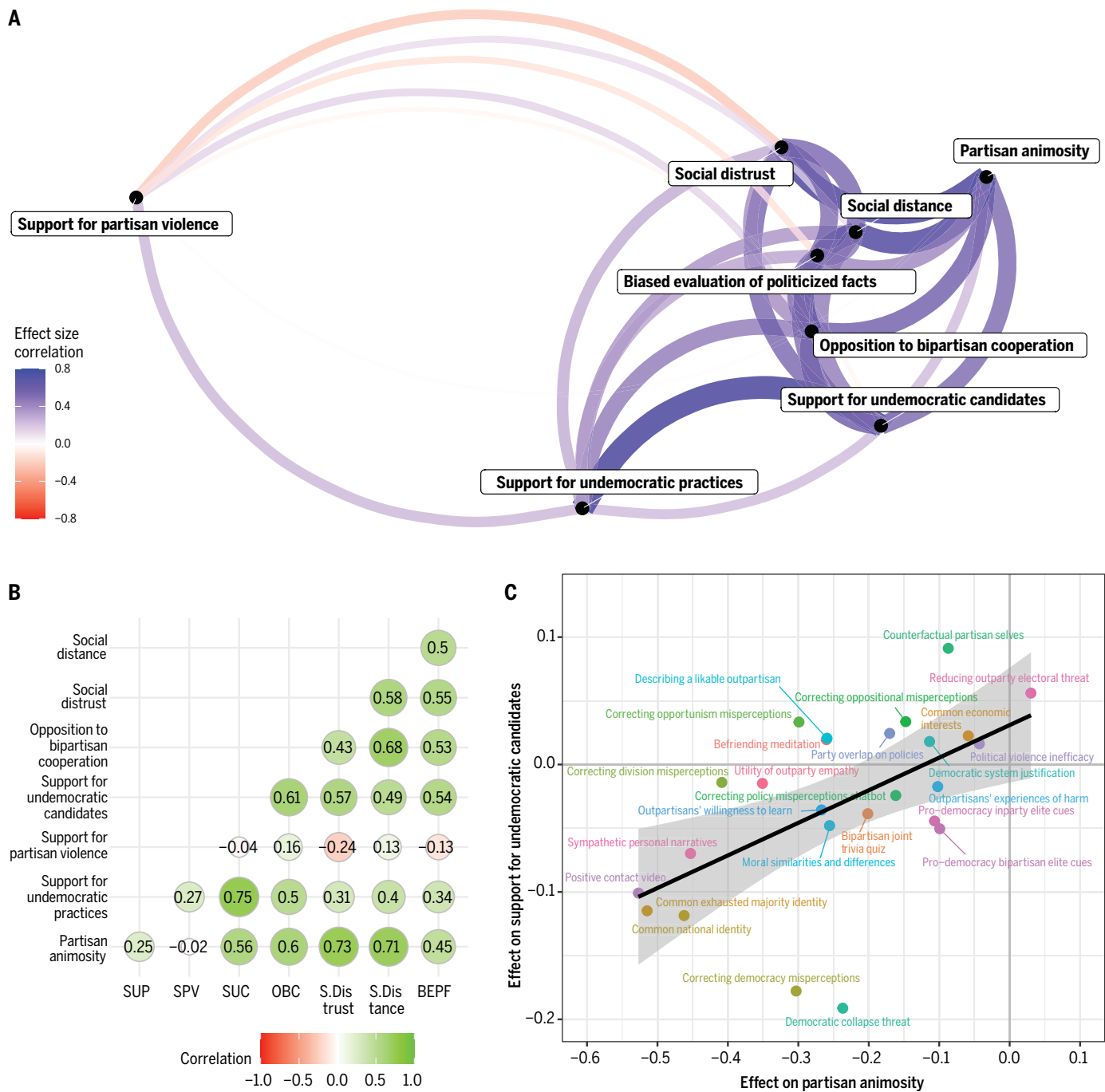
Fig. 3. Correlational analysis of the effect sizes of treatments on outcomes. We identify patterns of covariance among the outcome variables in response to the 25 treatments. (**A**) Effects of treatments on partisan animosity are strongly associated with effects on social distance, social distrust, biased evaluation of politicized facts, support for undemocratic candidates, and opposition to bipartisan cooperation, and they are weakly associated or unassociated with effects on support for undemocratic practices and support for partisan violence. (**B**) The pairwise correlations illustrated in (A). (**C**) Treatments reducing partisan animosity also tended to reduce Americans' support for undemocratic candidates. (A) is a network diagram visualizing Pearson correlation coefficients calculated using Cohen's *d* effect sizes across all 25 treatments, for each pair of outcome variables. Classical multidimensional scaling (principal coordinates analysis) was used to calculate two-dimensional coordinates for each vertex. Distances between outcomes indicate approximate dissimilarities (lack of correlated effects). A stronger, positive correlation implies that treatments affecting one outcome generally affected the other in the same direction and is represented with a darker-shaded network tie and closer proximity in the visualization. We find similar patterns for effect size correlations among Democrats and Republicans as well as weak and strong partisans (supplementary materials, section S11). (B) is a correlation matrix. (C) is a scatter plot showing treatment effects on partisan animosity and support for undemocratic candidates. Taken together, partisan animosity indexes some attitudes important to well-functioning democracies, including support for undemocratic candidates, but other important antidemocratic attitudes are largely distinct.

polarization and democracy. Instead, our findings emphasize the need for further theoretical work that goes beyond the present focus on partisan animosity, in particular work on the causes shaping support for undemocratic practices and partisan violence.

At the same time, we do find empirical evidence linking partisan animosity with one antidemocratic attitude—support for undemocratic candidates—because treatments reducing partisan animosity also tended to reduce this outcome ($r_{\text{effect size}}$ = 0.56). This relationship is illustrated by the mostly linear relationship between treatment effects on these outcomes displayed in Fig. 3C. Despite the strong correlation, only the four treatments with the largest effects on partisan animosity also significantly reduced support for undemocratic candidates. This may explain why prior research (35), which examined the consequences of treatments with smaller effects on partisan animosity, failed to find effects on support for undemocratic candidates. Additionally, the two treatments that most reduced support for undemocratic candidates do not appear near the regression line, which suggests that the most efficacious way to reduce support for undemocratic candidates is not through partisan animosity.

These results suggest that reductions in partisan animosity are not generally associated with reductions in antidemocratic attitudes but are associated with support for undemocratic candidates. One interpretation of this pattern is that animosity toward rival partisans is not particularly relevant for partisans' judgments of the acceptability of undemocratic actions by inparty leaders, but animosity toward outpartisans is relevant for voting decisions, where withholding support for an undemocratic inparty leader could benefit outpartisans.

Notably, we also found that partisan animosity was meaningfully linked to opposition to bipartisan cooperation ($r_{\text{effect size}}$ = 0.60) and, as noted above, biased evaluation of politicized facts ($r_{\text{effect size}}$ = 0.45). These outcomes—although not antidemocratic attitudes as we define them in this work—are related to healthy democratic functioning in the US, which often requires at least occasional bipartisan cooperation and which can be undermined when the public fails to agree on common facts.

Discussion

Our study makes several notable contributions to the understanding of public opinion related to polarization and democracy. We collected a large set of treatments designed to reduce partisan animosity, support for undemocratic practices, and/or support for partisan violence. In all, more than 250 treatments were submitted by more than 400 scholars from across the social sciences as well as practitioners. Testing 25 of these ideas, we find that many

treatments reduce both survey and behavioral indicators of partisan animosity. The most efficacious treatments used more general strategies for reducing partisan animosity, presenting relatable, sympathetic individuals with different political beliefs or highlighting a common cross-partisan identity. Additionally, we identify several treatments that reduced antidemocratic attitudes, thus filling an important gap in a literature that has focused almost exclusively on reducing partisan animosity (29). Treatments that most efficaciously reduced support for undemocratic practices and support for partisan violence included correcting exaggerated stereotypes of outpartisans or presenting prodemocratic cues from political elites. Highlighting the potentially disastrous consequences of democratic collapse was efficacious in reducing support for undemocratic practices but increased support for partisan violence.

Beyond identifying the efficacy of many unpublished treatments that reduce antidemocratic attitudes and partisan animosity, our study also validates some prior work on public opinion related to partisan divisions and democracy in the US. Some of the treatments that we tested were adapted from published papers demonstrating reductions in partisan animosity (52–54). Reassuringly, we replicated these published effects, which suggests that research on reducing partisan animosity is more reliable than might be assumed from the results of recent replication projects in other areas (32). With respect to reducing support for partisan violence, the two efficacious strategies that we identified—misperception corrections and elite cues are efficacious strategies—were also used by the two previous experimental treatments shown to reduce this outcome (22, 23).

An influential theoretical perspective argues that partisan animosity is a central concept underlying a diversity of attitudes, including antidemocratic attitudes (33). Recent work has challenged this claim, instead arguing that partisan animosity and antidemocratic attitudes are not directly causally related (34, 35). By examining a larger number of treatments than past work, testing treatments targeting different outcomes, and collecting a large set of outcomes, our study offers a strong empirical design for adjudicating these competing perspectives, ultimately supporting a more nuanced account. We find that some of the most critical antidemocratic attitudes—support for undemocratic practices and partisan violence—are clearly distinct from partisan animosity, which indicates that partisan animosity is not a unifying concept underpinning the psychology of polarization and democracy. Yet, we also find that partisan animosity remains important because treatments reducing this outcome also tended to reduce Americans' support for undemocratic candidates, a pivotal antidemocratic attitude. Additionally, we found

evidence that partisan animosity is causally linked with other outcomes with consequences for healthy democratic functioning and/or society more generally: opposition to bipartisan cooperation, biased evaluation of politicized facts, generalized trust, and preferences for social distance.

By identifying general strategies that influence antidemocratic attitudes and partisan animosity, our results may also help to identify causes of these outcomes that are present in the status quo. For example, it is likely that the absence of pacifying elite cues, and the presence of exacerbating elite cues, as well as social media feeds that promote the salience of extreme, strident—yet nonrepresentative—voices from rival partisans contribute to the erosion of democratic norms (55, 56). Similarly, it is likely that modern media environments (57, 58) and geographic segregation of partisans (49) contribute to rising partisan animosity by reducing exposure to sympathetic outpartisans and cross-cutting common identities while increasing exposure to extreme representations of outpartisans and partisan identities.

Another way to improve democratic functioning is through structural democratic reforms. We identify several (previously unpublished) treatments—most notably, democratic collapse threat—that significantly increased support for several proposed structural democratic reforms, such as automatic voter registration (tables S28 to S31). Another way to strengthen democratic societies is to reduce unfounded skepticism about election integrity. Polls show that 42% of Democrats (59) and 59% of Republicans (60) believe that the most recent presidential election that their party lost was illegitimate. We found two previously unpublished treatments—common national identity and democratic collapse threat—that reduced denial of recent presidential election results (one item from the biased evaluation of partisan facts composite; table S32).

Future directions and limitations

Although our use of a survey experiment allowed us to crowdsource and compare many treatment effects on a range of outcomes in a controlled setting, it remains an open question whether applications of the strategies identified in this work will produce similar effects in other settings. Several factors are important to consider when developing applications based on our findings. First, ensuring that people are exposed to a treatment is a crucial challenge for applications in the field; outside the context of an incentivized survey experiment, people may not be as motivated to attend to a treatment and thus may be harder to influence (61). Second, in less controlled information environments, people are exposed to a great deal of other information, some of which may

contradict the treatment, and such "counter-frames" can reduce treatment effects (62, 63). Third, we identify general strategies that are most efficacious in our research setting, and future efforts to apply this knowledge will likely benefit from tailoring treatments based on these strategies to fit the context and goals of a specific application. For example, treatments correcting exaggerated stereotypes of outpartisans (i.e., misperceptions of outpartisans) should only be expected to affect partisans' views on outcomes related to the substance of the correction and should be fit to the goals of a given application. We discuss several potential ways to strengthen treatment effects in the supplementary materials, section S12. Efforts to apply the strategies identified here in consequential field settings should also be rigorously evaluated to build further knowledge about how to meaningfully affect these important outcomes (64).

Another limitation of our study is our use of participants sampled from a nonprobability opt-in internet panel. Furthermore, our target population consists of US partisans, for which we used quota sampling to be representative on key demographics. We advise caution when seeking to generalize these findings to other populations, in particular populations beyond the US setting, because differences in cultural norms, media environments, and political and party systems are important potential scope conditions that future research needs to examine. We find limited evidence for heterogeneous treatment effects (HTEs) based on party membership or demographic characteristics across participant subgroups in analyses using generalized random forests to identify rank-weighted average treatment effects (supplementary materials, section S8), though our study was not focused on HTEs and, therefore, was underpowered for subgroup analyses. One notable exception, democratic collapse threat, reduced support for undemocratic practices and candidates but increased support for partisan violence among conservative Republicans (but not Democrats). We address other potential concerns—e.g., possible demand effects, robustness of results for outcomes with left-censored distributions, differential attrition, multiple testing, and measurement—in detail in the supplementary materials, section S13.

Additionally, we gain some insight on what are likely more effective modes of intervening on the outcomes that we study. In general, we do not find large, durable effects, especially for reducing antidemocratic attitudes, which suggests that a single exposure to a short, online treatment is typically insufficient to affect long-standing reductions in Americans' antidemocratic attitudes and partisan animosity. Instead, durable effects likely require structural and/or institutional interventions (65) that repeatedly and/or more strongly implement the general

strategies identified in this work. Modes of intervening that involve more impactful and/or repeated treatments, such as intervening through the content promoted by social media feed algorithms, elite political rhetoric, political journalism, and/or educational programs, might be particularly promising.

The decades-long increase in partisan animosity and concerning levels of public tolerance for recent endorsement of undemocratic behaviors by elite US politicians are major issues. Because these issues are driven by many causes, likely including structural and institutional factors, they cannot be fixed easily or quickly. Although improving the effectiveness of intervention efforts is unlikely to fully end or reverse long-term societal trends, this study advances knowledge about efficacious general strategies for reducing partisan animosity and antidemocratic attitudes that could be used in grassroots activities and by influential institutional actors to improve the effects of interventions on these concerning aspects of US public opinion.

Materials and methods summary

We used an open call for treatments designed to reduce partisan animosity, support for undemocratic practices, and/or support for partisan violence. We received 252 submissions from across the social sciences and from practitioners (table S4). With an advisory board of expert researchers and practitioners (supplementary materials, section S2.3), we selected 25 promising treatments for experimental testing (Table 1).

We ran a survey experiment ($n = 32,059$ participants) partnering with the sample provider Bovitz to recruit a sample that was quota-matched to be representative of the population of US Democrats and Republicans on key demographic benchmarks. Participants were randomly assigned to either a null control condition, an alternative control condition, or one of the 25 treatment conditions. Next, participants completed measures of our primary outcomes—partisan animosity, support for undemocratic practices, and/or support for partisan violence—and other exploratory outcomes. We also conducted a durability test ($n = 8644$), recruiting participants from the control conditions and from 10 of the most efficacious treatment conditions 2 weeks after their initial participation. Additionally, we conducted a forecasting survey with academics ($n = 98$) and practitioners ($n = 51$) working in the field of polarization. Full details of these data collections can be found in the supplementary materials.

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40. We exclude 2020 because of mode differences in data collection as a result of the COVID-19 pandemic.

41. More details and discussion of the relative efficacy of treatments can be found in the supplementary materials, section S7.

42. Many participants rejected partisan violence or supported it at very low levels. One might worry that observed treatment effects are driven by participants who already have low levels of support for partisan violence, and those with meaningful levels of support for violence may be unresponsive to the treatments in our study. To address this, we also tested the efficacy of treatments for reducing the percentage of individuals reporting support for partisan violence above the 25-point threshold on our 101-point composite measure of support for partisan violence, a threshold that we view as a meaningful level of support (14% of untreated participants exceeded this threshold). We find that five treatments significantly reduced the percentage of individuals scoring above this threshold (table S189), the same five treatments that significantly reduced levels of support for partisan violence in the preregistered analysis. The treatment with the largest effect size in this analysis, correcting division misperception, was also the same as in the preregistered analysis. This condition reduced the participants who scored above the threshold ($P < 0.001$) by 4 pp relative to the control condition. Put differently, the treatment with the largest effect size reduced the rate of American partisans exceeding this threshold of concerning levels of support for partisan violence by 28%, a substantively meaningful reduction.

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