Personality and Individual Differences 179 (2021) 110892

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Political polarization on COVID-19 pandemic response in the United States

John Kerr [a], Costas Panagopoulos [b], Sander van der Linden [a,*]

[a] Department of Psychology, University of Cambridge, Downing Site, Cambridge CB2 3EB, United Kingdom
[b] Department of Political Science, Northeastern University, Renaissance Park 902, Boston, MA 02115, USA

ARTICLE INFO

Keywords:
COVID-19
Polarization
Ideology
Partisanship
Coronavirus

ABSTRACT

Despite calls for political consensus, there is growing evidence that the public response to the COVID-19 pandemic has been politicized in the US. We examined the extent to which this polarization exists among the US public across two national studies. In a representative US sample ($N = 699$, March 2020) we find that liberals (compared to conservatives) perceive higher risk, place less trust in politicians to handle the pandemic, are more trusting of medical experts such as the WHO, and are more critical of the government response. We replicate these results in a second, pre-registered study ($N = 1000$; April 2020), and find that results are similar when considering partisanship, rather than political ideology. In both studies we also find evidence that political polarization extends beyond attitudes, with liberals consistently reporting engaging in a significantly greater number of health protective behaviors (e.g., wearing face masks) than conservatives. We discuss the possible drivers of polarization on COVID-19 attitudes and behaviors, and reiterate the need for fostering bipartisan consensus to effectively address and manage the COVID-19 pandemic.

1. Introduction

> "This is not the one to use for politics. It's like playing with fire… Please work across party lines, across ideology, across beliefs, across any differences for that matter. We need to behave. That's how we can defeat this virus."
>
> (Tedros Ghebreyesus, Director-General, World Health Organization, 2020, p. 6)

As countries around the world are designing policies and legislation to fight and contain a global pandemic, over half a million deaths have been recorded due to the novel coronavirus (SARS-CoV-2) with almost a quarter of those deaths occurring in the United States alone (CSSE, 2020). In the absence of a scalable vaccine or effective antiviral treatment, scholars have increasingly noted the important role of the social sciences in evaluating public opinion and the impact of non-pharmaceutical interventions (Van Bavel et al., 2020) such as mask wearing, social distancing, hand washing, and self-isolation. Crucially, the effectiveness of these interventions not only depends on an emerging scientific understanding of viral transmission dynamics (Zhang, Li, Zhang, Wang, & Molina, 2020) but also on the degree to which people voluntarily adopt and coordinate their behavior in the population at both local and global scales. As the Director-General of the WHO warns, increasing political polarization presents a direct threat to the effective management of the pandemic.

Although much rapid COVID-19 research is emerging, a large literature exists on the important role of political affiliation and political ideology in the public's understanding of science—especially in the United States—which can directly inform our expectations about the degree to which liberals and conservatives or Democrats and Republicans are likely to comply with—and express support for—key COVID-19 public health policies (Rutjens, van der Linden, & van der Lee, 2021).

1.1. Politicization of science

For example, although it is well-known that party identification can shape basic political perception (Bartels, 2002; Cohen, 2003), there have been increasing concerns about the general politicization of science (Druckman, 2017), including well-known partisan divisions over issues such as vaccination, GMO's, and climate change (Drummond & Fischhoff, 2017; Rutjens, Heine, Sutton, & van Harreveld, 2018; van der Linden, Panagopoulos, Azevedo, & Jost, 2020). As Bolsen and Druckman (2015) aptly summarize (p.1) "Few trends in science have generated as much discussion as its politicization". Similarly, Pittinsky (2015) refers to "America's crisis of faith in science". At the same time, political

* Corresponding author.
E-mail addresses: jk802@cam.ac.uk (J. Kerr), c.panagopoulos@northeastern.edu (C. Panagopoulos), sander.vanderlinden@psychol.cam.ac.uk (S. van der Linden).

https://doi.org/10.1016/j.paid.2021.110892
Received 19 September 2020; Received in revised form 26 March 2021; Accepted 28 March 2021
Available online 1 April 2021

polarization among both elites and the mass public has been on the rise in the United States (Fiorina, 2017; Hetherington, 2001; McCarty, Poole, & Rosenthal, 2016; Pew, 2014)—including affective polarization—or the increasing tendency to dislike and distrust members from the other party (Druckman, Klar, Krupnikov, Levendusky, & Ryan, 2020; Iyengar, Lelkes, Levendusky, Malhotra, & Westwood, 2019).

Importantly, a lively debate has formed around whether or not the observed polarization on scientific issues has been asymmetrical. The "asymmetry" hypothesis (Jost, 2017) suggests that as compared to liberals, there are defining motivating psychological features of the conservative ideology that make conservatives more likely to prefer a sense of order and structure, be less tolerant of uncertainty, more motivated to justify unequal economic systems, and be more likely to deny science and endorse fake news and conspiracy theories (Jost et al., 2003; Jost, van der Linden, Panagopoulos, & Hardin, 2018; Mooney, 2012; van der Linden et al., 2020). To this extent, evidence has indeed suggested that between 1974 and 2010, trust in science has only declined among conservatives (Gauchat, 2012). In fact, in 2010, a *Nature* editorial noted that, "[t]he anti-science strain pervading the right-wing in the United States is the last thing the country needs in a time of economic challenge" (Nature, 2010, p.1).

Yet, more recent research has questioned the asymmetry hypothesis suggesting that "bias is bipartisan" finding that both liberals and conservatives engage in motivated reasoning when the science is uncongenial to their political identity or ideology[1] (Ditto et al., 2019; Kahan, 2012; Kraft, Lodge, & Taber, 2015; Nisbet, Cooper, & Garrett, 2015; Washburn & Skitka, 2018). As a result, other research has offered contextual explanations such as that the degree and direction of political polarization over science may depend on the issue (Rutjens et al., 2018). One prominent example of this is the Anti-Reflexivity Hypothesis which suggests that, compared to liberals, "conservatives will show significantly less trust in, and support for, science that identifies the environmental and public health impacts of economic production" (McCright, Dentzman, Charters, & Dietz, 2013, p.1). We note that this view is not inconsistent with the theory of system justification (Jost, 2020), as policies that highlight the environmental and public health impacts of economic production typically call for social change and challenge the status quo. Accordingly, some research suggests that the aversion is therefore not inherent to science, but rather to what the science implies for public policy (Campbell & Kay, 2014).

1.2. Polarization on COVID-19

Based on the extant literature, we advance two theoretical reasons to expect a significant degree of political polarization on trust and support for a wide range of COVID-19 public health policies and behaviors such that conservatives/Republicans are generally less supportive than liberals/Democrats. In other words, we expect to find significant asymmetries on the COVID-19 pandemic response. First, from a "bottom-up" point of view, political ideology is often defined as the beliefs and values people hold about the way society is and how it should be (Jost, 2006). The global pandemic has required radical changes in the way that society is structured particularly in terms of social and economic relations. Social distancing, self-isolation, travel restrictions, and the closing down of schools and shops has had significant negative impacts on the economy (CBO, 2020; Nicola et al., 2020), directly challenging the status quo and organization of the economic system. Relatedly, governments around the world have put in place legislation that directly curtails the rights of individuals, including economic and personal freedoms. For example, in the United States, stay-at-home orders were issued in 42 states (Mervosh, Lu, & Swales, 2020). These measures directly challenge key dimensions of conservatism, including a strong preference for the status quo over social change, prioritization of individual freedom over collective egalitarian goals, and a desire for minimal government intervention (Jost, 2020; Stenner, 2009). Research on other issues with implications for public health, such as climate change, has found that, although science denial comes in many forms, denial is united by, "shared opposition to governmental regulatory efforts" (Dunlap & McCright, 2011, p. 144). In other words, from a contextual and issue-specific point of view, we expect that the COVID-19 pandemic response would elicit more support from liberals as opposed to those who hold conservative political worldviews.

A second "top-down" expectation is derived from the influence of media and elite cues. For example, a national survey found that 31% of Americans thought the threat of the coronavirus was being exaggerated for political reasons during the early stages of the pandemic (YouGov, 2020a), and about 50% Fox News viewers believed that Bill Gates created the disease as part of a vaccination conspiracy (YouGov, 2020b). Although there is debate about whether increased partisan media is fuelling political polarization (Prior, 2013), emerging research has found that, between March and May 2020, newspaper coverage of COVID-19 was highly polarized (Hart, Chinn, & Soroka, 2020). Moreover, studies find that far right-leaning media (e.g., Fox News, Breitbart) has particularly facilitated the spread of misinformation about the coronavirus as compared to the mainstream media (Motta, Stecula, & Farhart, 2020). Despite calls for bipartisanship, the Republican and Democratic parties have also presented differing pictures of the threat posed by the virus and its potential policy solutions. Throughout February and March 2020, President Trump consistently downplayed the virus, describing it as "mild" and "under control," while opposition leaders warned that the crisis was far worse. In fact, Bernie Sanders, an early 2020 Democratic presidential contender, described the pandemic as, "on the scale of a major war," (Glueck & Ember, 2020; Leonhardt, 2020). In April 2020, President Trump tweeted "LIBERATE VIRGINIA, and save your great 2nd Amendment. It is under siege!" as part of a controversial attempt to encourage conservative protestors to roll back stay-at-home orders in three states with Democratic governors (Martelle, 2020). In turn, Democrats, including Democratic presidential nominee Joe Biden, heavily criticized the Trump administration for its handling of the pandemic (Edelman & Smith, 2020).

Importantly, Druckman, Peterson, and Slothuus (2013) find that elite polarization can impact the manner in which ordinary citizens arrive at opinions about policy issues. Preliminary research supports this view, as there is evidence that people on opposite sides of the political aisle in the US are treating the virus differently. For example, a Pew research poll conducted in late March 2020 reported that 78% of Democratic party supporters considered the virus a major threat to the health of the US population, compared to only 52% Republicans (Pew, 2020). A recent large-scale analysis of tweets by members of the U.S. House and Senate during the COVID-19 pandemic confirms high levels of polarization in elite communication to the public, with congressional Democrats discussing the pandemic more frequently and emphasizing threats to public health more so than Republicans (Green, Edgerton, Naftel, Shoub, & Cranmer, 2020). These findings further strengthen the hypothesis that concern and support for COVID-19 are lower among U.S. conservatives compared to liberals in the U.S.

1.3. Present study

In the current paper, we provide a comprehensive assessment of political polarization on trust in and support for COVID-19 related opinions and behaviors in two national studies, including a pre-registered confirmatory replication. We note that, while examining attitudes towards the virus is important, the spread of the virus is dependent on the *behavior* of the public. As has been well documented in the psychological literature, attitudes do not always translate into behavior (Ajzen & Fishbein, 1977; Petty & Briñol, 2020). In the current research, we therefore investigate reported protective behaviors—such as hand washing and wearing face masks—to better understand the

[1] But see Baron and Jost (2019).

extent to which partisan differences can contribute to concrete public health outcomes, such as infection rates and, ultimately, deaths from the virus. We report the results of two US surveys examining the association between political orientation (both ideology and partisanship) and beliefs about COVID-19, trust in range of institutions relevant to COVID-19, and self-reported individual behavior.

2. Study 1

2.1. Methods

2.1.1. Sample

We recruited a national U.S. quota sample through Prolific (prolific.ac) between March 19–21, 2020. Prolific is an online crowdsourcing platform that generally offers higher quality samples than comparable platforms, such as Mturk (Peer, Brandimarte, Samat, & Acquisti, 2017). The sample was restricted by interlocking quotas to approximately match the U.S. population in terms of age, gender, and ethnicity, resulting in a final sample of $N = 699$ participants (355 women (51%); $M_{age} = 45.22$, $SD = 15.82$); median education level: bachelor's degree or equivalent). After providing informed consent, participants completed the survey on the Qualtrics survey platform (Qualtrics.com) and were fully debriefed at the conclusion of the survey. The study was approved by the Cambridge Psychology Research Ethics Committee (PRE.2020.034).

2.1.2. Measures

2.1.2.1. Political ideology. Ideology was measured with the item: *Where do you feel your political views lie on a spectrum of left wing (or liberal) to right wing (or conservative)?* (1 = very left/liberal, 7 = very right/conservative; $M = 3.23$, $SD = 1.64$). Because we wanted to compare standardized effect-sizes between liberals and conservatives throughout the paper, responses were recoded into three groups for analysis: Liberal (1–3; $n = 399$), Moderate (4; $n = 143$) and Conservative (5–7; $n = 157$). Alternative analyses using the full seven-point scale are presented in the supplementary material (table S1).

The survey[2] included a number of items covering attitudes about COVID-19 and government efforts to control the pandemic. Related items were combined to form composite scales (all $\alpha > 0.70$, scales ranged from 1 to 7). Descriptive statistics for all individual items are reported in the supplementary material (table S2).

2.1.2.2. Perceived risk. Risk perception of COVID-19 was measured as the average of six items (see Dryhurst et al., 2020) tapping both affective (e.g., worry about COVID-19) and cognitive aspects of the risk (e.g., likelihood of catching COVID-19) posed by the virus ($M = 4.94$, $SD = 1.14$, $\alpha = 0.82$).

2.1.2.3. Trust in experts. Trust regarding COVID-19 was measured as the average of three items asking participants the extent to which they trusted: (a) national scientific and medical advisors; (b) independent experts; and (c) the World Health Organization in the context of the pandemic ($M = 5.41$, $SD = 1.22$, $\alpha = 0.76$).

2.1.2.4. Government response. Perceptions of government response were measured as the average of five items which covered trust in politicians to deal effectively with the pandemic, how effective the government response has been thus far, and subjective understanding of the Government's strategy (example item: *How much do you trust the country's politicians to deal effectively with the pandemic?*; $M = 3.98$, $SD = 1.38$, $\alpha = 0.86$).

2.1.2.5. Personal efficacy. Efficacy was measured with a single item: To what extent do you feel that the personal actions you are taking to try to limit the spread of coronavirus make a difference? (1 = Not at all, 7 = Very much; $M = 5.26$, $SD = 1.44$).

2.1.2.6. Perceived scientific certainty. Scientific certainty was measured as the average of three items which asked participants about: (a) the extent to which they thought scientists understood the virus, (b) how certain they perceived current scientific knowledge about virus and (c) how certain they estimated the number of cases to be ($M = 4.13$, $SD = 1.17$, $\alpha = .73$).

2.1.2.7. Protective behavior. A protective behavior index was calculated as the sum of protective actions a respondent reported taking, out of 11 possible actions (M = 7.28, SD = 2.34, α = .73; examples include; "Washing your hands more often" and "Wearing a face mask"; see supplementary material, table S3 for all items).

2.2. Results

We conducted a series of one-way ANOVAs to examine the effect of political ideology on COVID-19 attitudes and reported behavior. As shown in Fig. 1, perceived risk differed significantly by political ideology ($F(2,696) = 22.28$, $p < .001$, $\eta^2 = 0.06$). Post-hoc tests using Tukey's HSD revealed that liberals' risk perception was significantly higher than that of conservatives ($M_{lib} = 5.16$, $SD = 1.00$; $M_{con} = 4.47$, $SD = 1.21$; $M_{diff} = -0.69$, 95CI [−0.93, −0.44], $p < .001$, Cohen's $d = 0.62$) and moderates ($M_{mod} = 4.87$, $SD = 1.25$; $M_{diff} = -0.28$, 95CI [−0.54, −0.03], $p < .05$, $d = 0.25$), and moderates' risk perception was higher than conservatives ($M_{diff} = -0.40$, 95CI [−0.7, −0.1], $p < .01$, $d = 0.33$).

Trust in experts regarding COVID-19 also differed by political ideology (F(2,696) = 40.33, $p < .001$, η2 = 0.10). Liberals were more trusting of the expertise of scientists and the WHO, compared to conservatives ($M_{lib} = 5.75$, $SD = 0.98$; $M_{con} = 5.00$, $SD = 1.28$; $M_{diff} = -0.75$, 95CI [−1.00, −0.49], $p < .001$, $d = 0.65$) and moderates ($M_{mod} = 4.91$, $SD = 1.41$; $M_{diff} = -0.84$, 95CI [−1.10, −0.57], $p < .001$, $d = 0.69$). There was no significant difference between moderates and conservatives ($M_{diff} = 0.09$, 95CI [−0.22, 0.40], $p = .77$, $d = -0.07$).

Our measure of government response—covering both trust in the government to manage the pandemic and belief that government actions are limiting the impact of the pandemic—also differed significantly by ideology ($F(2,696) = 72.87$, $p < .001$, $\eta^2 = 0.17$). All groups differed significantly from each other with conservatives expressing greatest endorsement of the government followed by moderates then liberals ($M_{lib} = 3.53$, $SD = 1.22$; $M_{mod} = 4.18$, SD = 1.36; $M_{con} = 4.93$, $SD = 1.25$; $M_{diff:lib-con} = 1.40$, 95CI [1.13, 1.68], $p < .001$, $d = -1.14$; $M_{diff:lib-mod} = 0.65$, 95CI [0.37, 0.94], $p < .001$, $d = -0.51$; $M_{diff:mod-con} = 0.75$, 95CI [0.41, 1.09], $p < .001$, $d = -0.57$).

Perceptions of scientific agreement also differed by ideology ($F(2,696) = 5.59$, $p < .05$, $\eta^2 = 0.01$); moderates perceived scientific knowledge regarding the virus to be more certain than liberals ($M_{lib} = 3.53$, $SD = 1.22$; $M_{mod} = 4.18$, $SD = 1.36$; $M_{diff} = -0.38$, 95CI [−0.65, −0.11], $p < .01$, $d = 0.33$). There were no significant differences between conservatives and liberals ($M_{con} = 4.13$, $SD = 1.22$; $M_{diff} = -0.09$, 95CI [−0.35, 0.17], $p = .68$, $d = 0.08$), or moderates and conservatives ($M_{diff} = 0.29$, 95CI [−0.03, 0.6], $p = .08$, $d = -0.24$).

There were no significant differences between groups in terms of personal efficacy (($F(2,696) = 1.03$, $p = .36$; $M_{lib} = 5.29$, $SD = 1.35$; $M_{mod} = 5.11$, $SD = 1.60$; $M_{con} = 5.32$, $SD = 1.50$; $M_{diff:lib-mod} = -0.18$, 95CI [−0.51, 0.15], $p = .39$, $d = 0.12$; $M_{diff:lib-con} = 0.03$, 95CI [−0.29, 0.35], $p = .97$, $d = -0.02$; $M_{diff:mod-con} = 0.21$, 95CI [−0.18, 0.6], $p = .41$, $d = -0.14$).

[2] The survey also included several unrelated experimental sections (about uncertainty), which were presented after the dependent variables in the current study to avoid potential confounds and are not reported here.

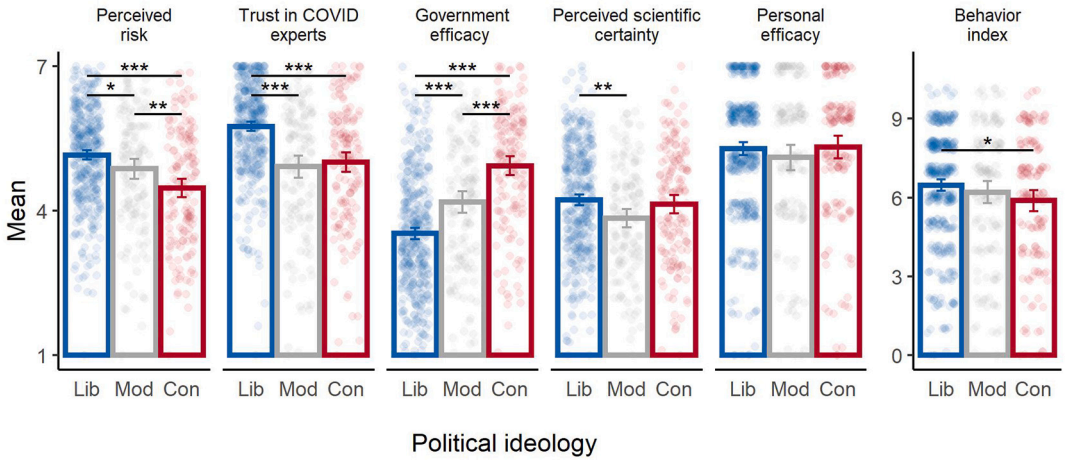

Fig. 1. Mean levels of COVID-19 risk perception, attitudes, and behavior among Liberals (Lib), Moderates (Mod) and Conservatives (Con). Error bars represent 95% CI and jittered points indicate underlying data distribution. *$p < .05$, **$p < .001$, ***$p < .001$.

Finally, the average reported number of protective behaviors differed significantly by ideology ($F(2,690) = 3.52$, $p < .05$, $\eta^2 = 0.01$). Liberals' mean score on the behavior index was significantly higher than that of conservatives ($M_{lib} = 7.47$, $SD = 2.18$; $M_{con} = 6.89$, $SD = 2.51$; $M_{diff} = -0.58$, 95CI [−1.1, −0.06], $p < .05$, $d = 0.25$)—indicating that, on average, liberals report engaging in more protective behaviors than their ideological counterparts. There was no significant difference between liberals and moderates ($M_{mod} = 7.20$, SD = 2.52; $M_{diff} = -0.27$, 95CI [−0.80, 0.27], $p = .47$, $d = 0.11$) or moderates and conservatives ($M_{diff} = -0.31$, 95CI [−0.95, 0.33], $p = .49$, $d = 0.12$).

3. Study 2

In light of the degree of political polarization found in Study 1, which was relatively exploratory, we wanted to confirm these findings using both political party affiliation and political ideology on a representative U.S. sample. Accordingly, based on the findings from Study 1, we preregistered our hypotheses about political polarization on AsPredicted for Study 2 (peer-review link: https://aspredicted.org/blind.php?x=nq9si2).[3] The study was approved by the Northeastern University IRB committee.

3.1. Methods

3.1.1. Sample

We fielded a YouGov survey on April 16, 2020. YouGov samples are matched to a nationally representative sampling frame on gender, age, race, and education constructed by stratified sampling from the 2017 American Community Survey. The final sample comprised of $N = 1000$ participants (526 women (52.6%); mean age, 48.6 (SD = 17.6); median education level: some college; in terms of race, 682 (68.2%) participants identified as White, 132 (13.2%) as Hispanic, and 109 (10.9%) as Black; a full breakdown of demographic variables can be found in the supplementary material (table S4).

[3] The survey included an experimental manipulation. Half of participants read a version of the survey in which all references to COVID were changed to 'the Chinese virus' (a term used by U.S. President Trump), to test the hypothesis that this framing would further polarize responses [see preregistration]. We did not find a significant main effect of the manipulation on any of the variables reported here (*t*-tests comparing means between treatment groups revealed no significant differences, all *ps* > 0.35) nor any significant interactions with partisanship or ideology (full analyses are provided in the supplementary materials, tables S6, S7). As such, we proceeded to analyze both experimental groups together to increase power in the analyses reported below.

3.1.2. Measures

Following Study 1, a number of items were included in the Study 2 survey to more closely examine the relationship between political leanings and trust in different political actors regarding COVID-19. Responses were captured on a scale ranging from 1 (*Not at all*) to 7 (*Very much*). Full item wording can be found in supplementary material (table. S5).

3.1.2.1. Trust. Participants reported their level of trust in the following entities to "deal effectively with the pandemic": (a) politicians generally ($M = 3.30$, $SD = 1.67$), (b) Congress ($M = 3.36$, $SD = 1.67$), (c) President Trump ($M = 3.47$, $SD = 2.4$), (d) their Governor ($M = 4.52$, $SD = 1.98$) and (e) local elected officials ($M = 4.36$, $SD = 1.76$). They also once again reported their trust in national scientific and medical advisors ($M = 5.24$, $SD = 1.58$) and the WHO ($M = 4.19$, $SD = 2.07$) to "know the best measures to take in the face of the pandemic," and trust in journalists and commentators reporting on the pandemic ($M = 3.59$, $SD = 2.01$).

3.1.2.2. Efficacy. Participants rated the effectiveness of the official response in dealing with the pandemic ($M = 3.91$, $SD = 1.81$) and the extent to which they felt that their personal efforts to limit the spread of coronavirus were making a difference ($M = 5.42$, $SD = 1.57$).

3.1.2.3. Protective behavior index. Participants also again indicated which protective behaviors (from a list of 11) they had or had not engaged in (note that while there was some overlap, this list was not identical to the list used in Study 1; see table S8). A behavioral index was calculated as the summed number of behaviors reported ($M = 6.48$, $SD = 3.12$, $\alpha = 0.82$).

3.1.2.4. Political ideology and party affiliation. Participants completed a continuous measure of political ideology (1 = *Very liberal* to 5 = *Very conservative*; 60 participants who responded with "*Not sure*" were excluded). For comparison with Study 1, participants were split into three group on the basis of this measure: Liberals (scoring 1–2; $n = 320$), Moderates (3; $n = 289$) and Conservatives (4–5; $n = 311$). Participants' political party identification was recorded as Democrat ($n = 378$), Independent ($n = 284$) or Republican ($n = 232$). Respondents who selected "Other" ($n = 44$) or "Not sure" ($n = 62$) were excluded from the analyses below. Participants also reported their degree of partisanship separately on 7-point scale (1 = *Strong Democrat* to 7 = *Strong Republican*; $M = 3.57$, $SD = 2.19$; 44 participants selecting "*Not sure*" were excluded). The results reported here compare groups based on their political ideology for consistency with Study 1. Alternative analyses employing the

continuous ideology and categorical partisanship variables returned very similar results to those reported here[4] and can be found in the supplementary material (tables S5, S9, Fig. S1). Respondents also reported their U.S. state of residence.

3.2. Results

Given the larger number of separate dependent variables considered in Study 2, we first ran a MANOVA, which revealed a significant main effect of political ideology, $F(22, 1792) = 35.54$, Wilks' $\lambda = 0.48$, $p < .001$, $\eta^2 = 0.30$, indicating that COVID-19 attitudes and behavior differed across ideological groups. The results of the pre-registered univariate analyses using ANONVA and post hoc adjustment using Tukey's HSD for each variable are reported below and visualized in Fig. 2.

Trust in politicians differed significantly by ideology, $F(2, 917) = 16.462$, $p < .001$, $\eta^2 = 0.03$, with liberals reporting lower trust than conservatives ($M_{lib} = 2.90$, $SD = 1.54$; $M_{con} = 3.65$, $SD = 1.76$; $M_{diff} = 0.75$, 95CI [0.44, 1.05], $p < .001$, $d = -0.45$), and moderates ($M_{mod} = 3.27$, $SD = 1.59$; $M_{diff} = 0.36$, 95CI [0.05, 0.67], $p < .05$, $d = -0.23$). Moderates were also less trusting of politicians than conservatives ($M_{diff} = 0.38$, 95CI [0.07, 0.7], $p < .05$, $d = -0.23$).

In contrast there was no significant difference between ideological groups in terms of their trust in Congress ($F(2, 917) = 0.797$, $p = .45$; $M_{lib} = 3.38$, $SD = 1.61$; $M_{mod} = 3.38$, $SD = 1.56$; $M_{con} = 3.23$, $SD = 1.81$; $M_{diff:lib\text{-}mod} = -0.01$, 95CI [−0.32, 0.31], $p = .99$, $d = 0.00$; $M_{diff:lib\text{-}con} = -0.15$, 95CI [−0.46, 0.16], $p = .5$, $d = 0.09$; $M_{diff:mod\text{-}con} = -0.14$, 95CI [−0.46, 0.18], $p = .55$, $d = 0.08$).

Ideology was significantly associated with trust in the state governor regarding the pandemic response, $F(2, 915) = 3.737$, $p < .05$, $\eta^2 = -0.23$. Liberals expressed greater trust in their governor compared to moderates ($M_{lib} = 4.81$, $SD = 2.02$; $M_{mod} = 4.41$, $SD = 1.99$; $M_{diff} = -0.40$, 95CI [−0.77, −0.02], $p < .05$, $d = 0.20$), but there was no difference between liberals and conservatives ($M_{con} = 4.46$, $SD = 1.93$; $M_{diff} = -0.35$, 95CI [−0.72, 0.02], $p = .07$, $d = 0.18$), or moderates and conservatives ($M_{diff} = 0.04$, 95CI [−0.33, 0.42], $p = .96$, $d = -0.02$).

There was no significant difference between groups in terms of trust in local officials ($F(2, 916) = 1.778$, $p = .17$; $M_{lib} = 4.54$, $SD = 1.78$; $M_{mod} = 4.28$, $SD = 1.74$; $M_{con} = 4.35$, $SD = 1.76$; $M_{diff:lib\text{-}mod} = -0.26$, 95CI [−0.6, 0.08], $p = .17$, $d = 0.15$; $M_{diff:lib\text{-}con} = -0.19$, 95CI [−0.52, 0.14], $p = .38$, $d = 0.11$; $M_{diff:mod\text{-}con} = 0.07$, 95CI [−0.27, 0.41], $p = .87$, $d = -0.04$).

Trust in President Trump to handle the pandemic differed considerably by ideology, and here we see the largest effect of ideology on trust: $F(2, 914) = 363.499$, $p < .001$, $\eta^2 = 0.44$. Specifically, liberals placed significantly less trust in the President compared to conservatives ($M_{lib} = 1.66$, $SD = 1.44$; $M_{con} = 5.57$, $SD = 1.81$; $M_{diff} = 3.90$, 95CI [3.56, 4.24], $p < .001$, $d = -2.39$) and moderates ($M_{mod} = 3.21$, $SD = 2.19$; $M_{diff} = 1.55$, 95CI [1.2, 1.9], $p < .001$, $d = -0.84$). Moderates in turn were also less trusting of Trump than conservatives ($M_{diff} = 2.35$, 95CI [2, 2.7], $p < .001$, $d = -1.17$).

Considering national scientific and medical advisors, we report that trust in these actors to know the best measures to take differs significantly across ideological lines, $F(2, 914) = 31.925$, $p < .001$, $\eta^2 = 0.06$). Liberals were more trusting of advisors than conservatives ($M_{lib} = 5.81$, $SD = 1.41$; $M_{con} = 4.85$, $SD = 1.60$; $M_{diff} = -0.96$, 95CI [−1.24, −0.67], $p < .001$, $d = 0.64$) and moderates ($M_{mod} = 5.23$, $SD = 1.53$; $M_{diff} = -0.57$, 95CI [−0.86, −0.28], $p < .001$, $d = 0.39$). Moderates were in turn more trusting than conservatives ($M_{diff} = -0.38$, 95CI [−0.67, −0.09], $p < .05$, $d = 0.25$).

Result were similar for trust in the WHO, $F(2, 913) = 164.447$, $p < .001$, $\eta^2 = 0.26$; liberals expressed greater trust in the WHO than conservatives ($M_{lib} = 5.41$, $SD = 1.47$; $M_{con} = 2.82$, $SD = 1.99$; $M_{diff} = -2.6$, 95CI [−2.93, −2.26], $p < .001$, $d = 1.48$) and moderates ($M_{mod} = 4.36$, $SD = 1.92$; $M_{diff} = -1.05$, 95CI [−1.39, −0.7], $p < .001$, $d = 0.61$), and moderates expressed more trust than conservatives ($M_{diff} = -1.55$, 95CI [−1.89, −1.2], $p < .001$, $d = 0.79$). We note the pattern of effects reported for trust in advisors and the WHO here mirrors those reported in Study 1 for the composite trust in experts measure.

Trust in journalists followed a similar pattern, $F(2, 914) = 131.813$, $p < .001$, $\eta^2 = 0.22$; liberals were more trusting of journalists than conservatives ($M_{lib} = 4.72$, $SD = 1.69$; $M_{con} = 2.40$, $SD = 1.84$; $M_{diff} = -2.32$, 95CI [−2.66, −1.99], $p < .001$, $d = 1.32$) and moderates ($M_{mod} = 3.72$, $SD = 1.88$; $M_{diff} = -1$, 95CI [−1.35, −0.66], $p < .001$, $d = 0.56$), with moderates also more trusting than conservatives ($M_{diff} = -1.32$, 95CI [−1.67, −0.98], $p < .001$, $d = 0.71$).

Political groups also differed in their ratings of government efficacy in the face of the pandemic, $F(2, 916) = 168.78$, $p < .001$, $\eta^2 = 0.27$. Liberals, on average ($M_{lib} = 2.85$, $SD = 1.49$), gave the lowest ratings followed by moderates ($M_{mod} = 3.79$, $SD = 1.77$) then conservatives ($M_{con} = 5.14$, $SD = 1.44$). All groups differed significantly from each other ($M_{diff:lib\text{-}mod} = 0.94$, 95CI [0.64, 1.23], $p < .001$, $d = -0.57$; $M_{diff:lib\text{-}con} = 2.29$, 95CI [1.99, 2.58], $p < .001$, $d = -1.56$; $M_{diff:mod\text{-}con} = 1.35$, 95CI [1.05, 1.65], $p < .001$, $d = -0.84$).

In agreement with the results of Study 1, we report no significant effect of ideology on ratings of personal efficacy ($F(2, 916) = 1.748$, $p = .17$; $M_{lib} = 5.61$, $SD = 1.42$; $M_{mod} = 5.43$, $SD = 1.56$; $M_{con} = 5.4$, $SD = 1.59$; $M_{diff:lib\text{-}mod} = -0.18$, 95CI [−0.47, 0.11], $p = .30$, $d = 0.12$; $M_{diff:lib\text{-}con} = -0.21$, 95CI [−0.49, 0.08], $p = .20$, $d = 0.14$; $M_{diff:mod\text{-}con} = -0.03$, 95CI [−0.32, 0.27], $p = .97$, $d = 0.02$).

Lastly, we report a significant effect of ideology on reported preventative behaviors, $F(2, 891) = 8.265$, $p < .001$, $\eta^2 = 0.02$. Consistent with Study 1, liberals' average score on the behavior index was significantly higher than conservatives ($M_{lib} = 7.22$, $SD = 2.78$; $M_{con} = 6.05$, $SD = 3.17$; $M_{diff} = -1.17$, 95CI [−1.73, −0.61], $p < .001$, $d = 0.39$) and moderates ($M_{mod} = 6.47$, $SD = 3.09$; $M_{diff} = -0.75$, 95CI [−1.33, −0.18], $p < .05$, $d = 0.26$), indicating that liberals report engaging in more protective behaviors. There was no significant difference between moderates and conservatives ($M_{diff} = -0.42$, 95CI [−1, 0.16], $p = .20$, $d = 0.13$).

We conducted an additional exploratory analysis to determine if the effect of ideology on trust in governors is conditional on the party affiliation of the governor in a respondent's home state—that is, do Americans place greater trust in their governors to handle the pandemic when they share partisan or ideological identities? Gubernatorial party data was sourced from Ballotpedia.com (26 Democrat governors and 27 Republican governors) and participants coded as living in a state with a Democrat ($n = 556$) or Republican ($n = 439$) governor. A 3(ideology)x2 (Governor party) ANOVA of trust in governor revealed a significant interaction $F(2,907) = 52.94$, $p < .001$, $\eta^2 = 0.10$, visualized in Fig. 3.

Post hoc comparisons (Tukey's HSD) revealed that liberals reported significantly higher trust in their governors when they were Democrats ($M_{Dem} = 5.62$, $SD = 1.56$) rather than Republicans ($M_{Rep} = 3.61$, $SD = 2.04$; $M_{diff} = -2.01$, 95CI[−2.41, -1.60], $p < .001$, $d = 1.11$). A similar, albeit weaker, difference was noted for moderates living in Democratic vs. Republican governor states ($M_{Dem} = 4.71$, $SD = 1.88$; $M_{Rep} = 4.07$, $SD = 2.06$; $M_{diff} = -0.65$, 95CI [−1.10, −0.19], $p < .01$, $d = 0.33$). Conversely, conservatives who lived in states with a Democratic governor reported lower trust in their governors than those who lived in Republican governor states ($M_{Dem} = 3.98$, $SD = 2.02$; $M_{Rep} = 5.07$, $SD = 1.60$; $M_{diff} = 1.10$, 95CI [0.68, 1.51], $p < .001$, $d = -0.60$).

4. Discussion

Political orientation is associated with views on a panoply of social issues (Jost et al., 2003; Sterling, Jost, & Hardin, 2019), and the results of the two studies presented here show COVID-19 is no exception. Across two national studies we report that conservative political ideology is

[4] The pattern of pairwise significant differences between liberals and conservatives, and Democrats and Republicans was identical across all variables.

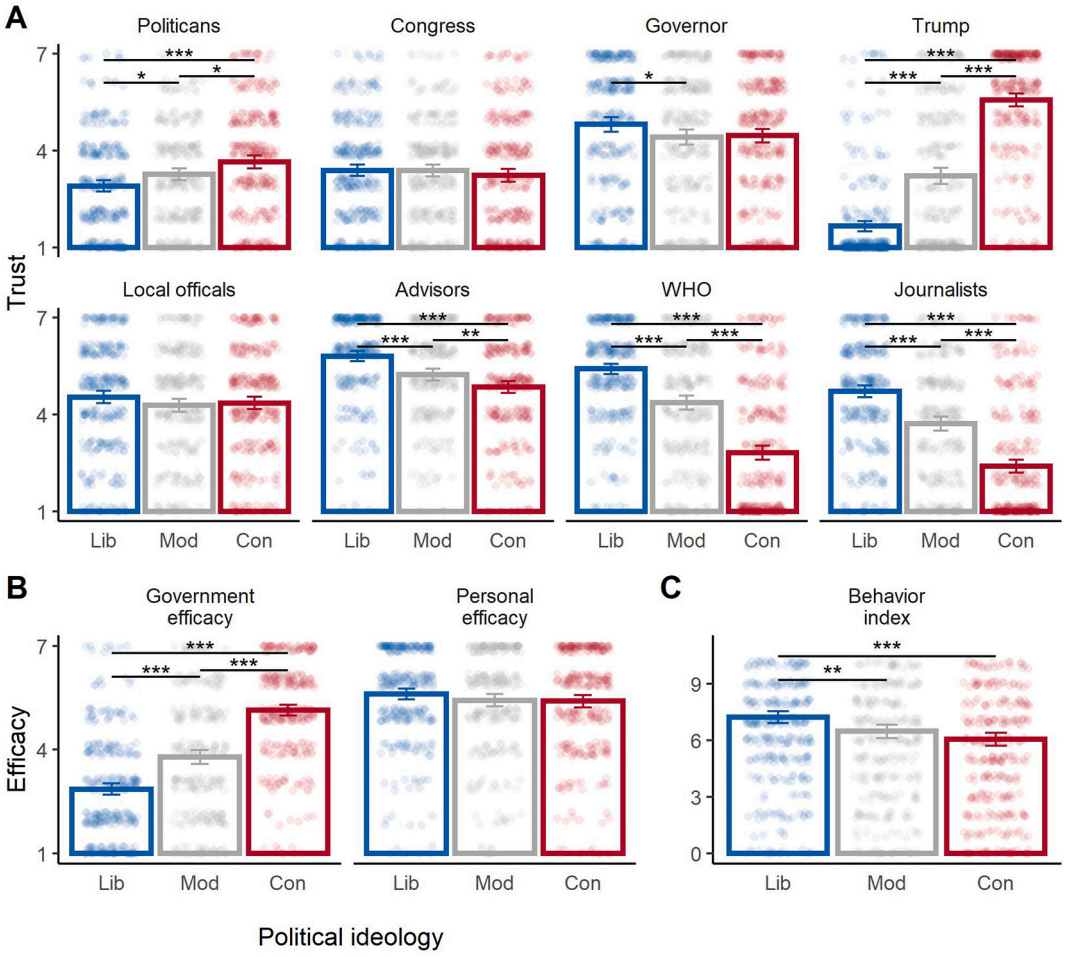

Fig. 2. Mean scores on trust (A) and efficacy (B) items and mean number of protective behaviors reported (C), by political ideology. Error bars represent 95% CI and jittered points indicate underlying distribution. *$p < .05$, **$p < .001$, ***$p < .001$.

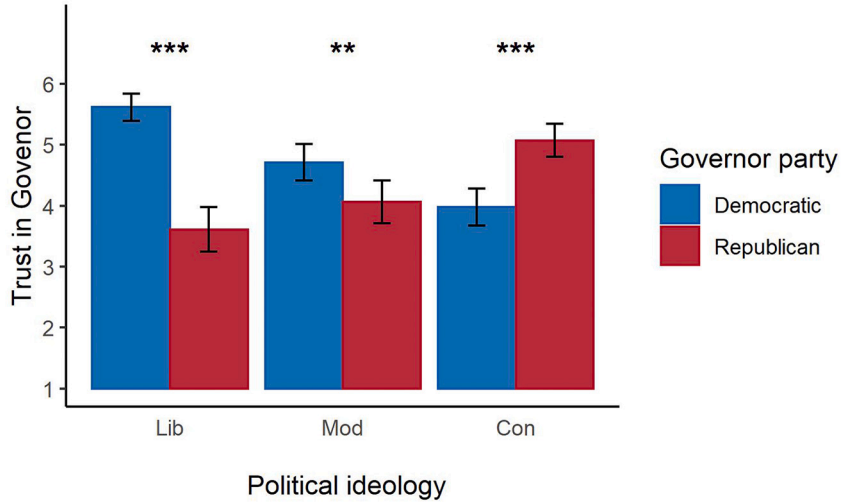

Fig. 3. Mean trust in governor among political groups in states with Democratic and Republican Governors. *$p < .05$, **$p < .001$, ***$p < .001$.

significantly linked to greater trust in government authorities to manage COVID-19, lower trust in scientists and the WHO and lower perceived risk of the virus. We also report that these ideological differences are significantly associated with behavior: conservative participants reported fewer protective actions such wearing a mask or handwashing. In the case of Study 2, results proved robust and were further corroborated with an alternative measure of political orientation: party identification (see supplementary materials). These effects were also not trivial, nearly all significant partisan differences revealed standardized effect-sizes in the range of medium to high (Cohen, 1988; Funder & Ozer, 2019).

The public health implications of these political differences are important. Already there is emerging evidence that political divisions

have delayed implementation of lockdown measures, with US counties with Republican majorities slower to act in the face of the outbreak, leading to increased infections (Rosenfeld, 2020). In fact, epidemiological models using GPS location data estimate that political polarization on COVID-19 results in inefficient rates of social distancing across the U.S. population, which is associated with higher disease transmission and economic costs (Gollwitzer et al., 2020; Allcott et al., 2020). Similar ideological and partisan differences have been noted with regard to the acceptability COVID-19 vaccines, with US conservatives and Republicans less likely to report intentions to receive a vaccine (Kerr et al., 2020; Khubchandani et al., 2021; Roozenbeek et al., 2020).

Whether the lower risk perceptions among conservatives is a product of right-wing attitudes more generally or due to elite top-down messaging and media polarization remains an open question. On the one hand, it is possible that fundamental psychological motivations underpinning ideology influence perceptions of COVID-19 risk. For example, Choma, Hanoch, Gummerum, and Hodson (2013) report that liberals, compared to conservatives, express greater concern over risks which pose a threat not just to the individual but to society as whole, for example, smoking, pesticides, and handguns. The authors suggest that this difference may arise from liberal's greater endorsement of moral foundations pertaining to the harm and care of others (Graham, Haidt, & Nosek, 2009). In the context of COVID-19, research has also found that egalitarian—as opposed to individualistic worldviews—are strongly associated with higher coronavirus risk perceptions (Dryhurst et al., 2020).

On the other hand, conservatives' relative ambivalence over COVID-19 might simply arise from the political messaging of President Trump and other Republican party elites who, at the time of the surveys, consistently downplayed the threat posed by the virus in press conferences and tweets (Yamey & Gonsalves, 2020). As shown in our analysis of trust in Governors (Study 2) individuals express greater trust in the political elites on 'their side' at the state level, in agreement with previous research examining trust in elected officials in the US (e.g., Citrin & Green, 1986; Morisi, Jost, & Singh, 2019). Assuming that conservative attitudes are influenced to some degree by elite messages, political discourse is therefore a possible avenue by which conservative attitudes might be aligned with public health targets. As trusted sources among the right, the President and other Republican leaders are in a privileged position to influence conservatives' opinion on the virus and urge an evidence-based course of action towards limiting the spread of the virus (e.g., following WHO and CDC guidelines on social distancing). At the time of writing, the Republican leadership has not been forthcoming with such recommendations (Dearen & Stobbe, 2020; Yamey & Gonsalves, 2020). In fact, analyses of tweets from members of the U.S. House and Senate reveal strong polarization in elite communication on the issue, with Democratic elites emphasizing threats to public health while Republican elites focus more on business impacts and blaming China (Green et al., 2020). Other research also finds a high degree of polarization on Twitter with users from liberal-leaning states being highly critical of political elites whereas users from conservative-leaning states consistently promote hashtags in support of the President and are less likely to promote health preventative behaviors online (Jiang, Chen, Yan, Lerman, & Ferrara, 2020). As the current studies show, Republicans and conservatives place a great deal of trust in the President and government and are therefore are more likely to form a perception of the virus that aligns with the President's talking points. As noted by Jacquet, Dietrich, and Jost (2014), conservative attitudes on a range of social issues are likely a result of both "bottom-up" psychological and "top-down" situational mechanisms in concert (see also Jost, Federico, & Napier, 2009). Future research is needed to disentangle the relative contribution of each pathway in influencing COVID-19 attitudes.

Considering more bottom-up influences, solution aversion, a form of motivated reasoning, offers another possible explanation for conservatives' lower risk perception and level of engagement in protective behaviors. Solution aversion refers to individuals' tendency to downplay risks because to acknowledge the threat would be to invite politically uncongenial policy solutions. Put another way, individuals ascribe less weight to risks requiring value-incongruent mitigation solutions. Campbell and Kay (2014) outline that conservative denial of climate change impacts as a form of solution aversion; right wing individuals are motivated to deny climate risks not necessarily because they don't understand the science but because acknowledging them would be to implicitly acknowledge the need for government interventions (e.g., carbon taxes) which conflicts with free-market values (a key component of U.S. conservative ideology; Azevedo, Jost, Rothmund, & Sterling, 2019).

A similar process could be at play in relation to COVID-19. Government restrictions on individual freedom of movement and business operations are key plank of the public health response to the virus. Through a process of motivated reasoning, conservative Americans may be drawn to the conclusion that the virus is not a great threat, negating the need for unpalatable government interventions. Indeed, previous research has found that individualistic worldviews (favoring individual rights over government intervention) were a consistent, negative correlate of COVID-19 risk perceptions in the U.S. and several other countries (Dryhurst et al., 2020). As a potential intervention to counteract solution aversion, Campbell (2018) suggests "ideological affirmation"—or acknowledging the importance and value of an individual's ideological position before proposing a solution. Future experimental research could explore the efficacy of this approach in reducing political polarization on the COVID-19 pandemic response.

Of course, our research is not without limitations. A key limitation of the current research is its cross-sectional nature, which limits the inferences that can be made regarding the causal direction of the effects. To ensure the robustness of the strong and significant partisan differences observed here across a range of different measures and operationalization's of political orientation, we conducted two separate national surveys (one pre-registered) about one month apart. Although it is unlikely that the virus engendered a major shift in individuals' political ideology given that ideology is a relatively stable construct in adults (Peterson, Smith, & Hibbing, 2020; Sears & Funk, 1999), it is possible that over the longer term the threat the virus poses to public health and the economy may shift Americans towards a more conservative political stance. For example, Duckitt and Fisher (2003) provide experimental evidence that dangerous and threatening environments push people towards conservative social values. Indeed, after the 9/11 World Trade Centre bombings, U.S. politics and Americans' personal political views gravitated towards the conservative end of the ideological spectrum (Hersh, 2013; Nail & McGregor, 2009). Lastly, we note that the extremity of these results may be specific to the dynamics of U.S. politics. Public opinion is less likely to become heavily polarized when elites are in consensus. For example, in contrast to the United States, Canadian political elites and the public have shown a unique level of cross-partisan consensus on COVID-19 (Merkley et al., 2020).

In conclusion, our converging results across two separate national surveys and multiple measures of political orientation support the conclusion that COVID-19 attitudes and behaviors vary significantly between conservatives and liberals in the US. In order to effectively manage the pandemic, bipartisan consensus is required. Future research should address how to effectively bridge the partisan divide on COVID-19 pandemic response.

CRediT authorship contribution statement

John Kerr: Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition. **Costas Panagopoulos:** Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition. **Sander van der Linden:** Data curation, Methodology, Visualization, Formal analysis, Writing – original draft.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2021.110892.

References

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*(5), 888–918. https://doi.org/10.1037/0033-2909.84.5.888.

Allcott, H., Boxell, L., Conway, J., Gentzkow, M., Thaler, M., & Yang, D. Y. (2020). Polarization and public health: Partisan differences in social distancing during the Coronavirus pandemic. NBER Working Paper, (w26946).

Azevedo, F., Jost, J. T., Rothmund, T., & Sterling, J. (2019). Neoliberal ideology and the justification of inequality in capitalist societies: Why social and economic dimensions of ideology are intertwined. *Journal of Social Issues, 75*(1), 49–88. https://doi.org/10.1111/josi.12310.

Baron, J., & Jost, J. T. (2019). False equivalence: Are liberals and conservatives in the United States equally biased? *Perspectives on Psychological Science, 14*(2), 292–303.

Bartels, L. M. (2002). Beyond the running tally: Partisan bias in political perceptions. *Political Behavior, 24*(2), 117–150.

Bolsen, T., & Druckman, J. N. (2015). Counteracting the politicization of science. *Journal of Communication, 65*(5), 745–769.

Campbell, T. H. (2018). Solution aversion. Behavioural Public Policy Blog. , March 27 https://bppblog.com/2018/03/27/solution-aversion/.

Campbell, T. H., & Kay, A. C. (2014). Solution aversion: On the relation between ideology and motivated disbelief. *Journal of Personality and Social Psychology, 107*(5), 809–824. https://doi.org/10.1037/a0037963.

Center for Systems Science and Engineering (CSSE), 2020. COVID-19 dashboard. John Hopkins University, USA. Retrieved from https://coronavirus.jhu.edu/us-map.

Choma, B. L., Hanoch, Y., Gummerum, M., & Hodson, G. (2013). Relations between risk perceptions and socio-political ideology are domain- and ideology- dependent. *Personality and Individual Differences, 54*(1), 29–34.

Citrin, J., & Green, D. P. (1986). Presidential leadership and the resurgence of trust in government. *British Journal of Political Science, 16*(4), 431–453. https://doi.org/10.1017/S0007123400004518.

Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology, 85*(5), 808–822.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: L. Erlbaum Associates.

Congressional Budget Office (CBO). (2020). Interim economic projections for 2020 and 2021. *Available from*. https://www.cbo.gov/publication/56351.

Dearen, J., & Stobbe, M. (2020, May 13). Read "Shelved" CDC guidelines on U.S. Coronavirus reopening. Time. https://time.com/5836115/cdc-guidance-reopening-white-house/.

Ditto, P. H., Liu, B. S., Clark, C. J., Wojcik, S. P., Chen, E. E., Grady, R. H., … Zinger, J. F. (2019). At least bias is bipartisan: A meta-analytic comparison of partisan bias in liberals and conservatives. *Perspectives on Psychological Science, 14*(2), 273–291.

Druckman, J. N. (2017). The crisis of politicization within and beyond science. *Nature Human Behaviour, 1*(9), 615–617.

Druckman, J. N., Klar, S., Krupnikov, Y., Levendusky, M., & Ryan, J. B. (2020). How affective polarization shapes Americans' political beliefs: A study of response to the COVID-19 pandemic. *Journal of Experimental Political Science*, 1–20.

Druckman, J. N., Peterson, E., & Slothuus, R. (2013). How elite partisan polarization affects public opinion formation. *American Political Science Review*, 57–79.

Drummond, C., & Fischhoff, B. (2017). Individuals with greater science literacy and education have more polarized beliefs on controversial science topics. *Proceedings of the National Academy of Sciences, 114*(36), 9587–9592.

Dryhurst, S., Schneider, C. R., Kerr, J., Freeman, A. L. J., Recchia, G., van der Bles, A. M., … van der Linden, S. (2020). Risk perceptions of COVID-19 around the world. *Journal of Risk Research, 23*(7), 994–1006. https://doi.org/10.1080/13669877.2020.1758193.

Duckitt, J., & Fisher, K. (2003). The impact of social threat on worldview and ideological attitudes. *Political Psychology, 24*(1), 199–222. https://doi.org/10.1111/0162-895X.00322.

Dunlap, R. E., & McCright, A. M. (2011). Organized climate change denial. In *The Oxford handbook of climate change and society* (pp. 144–160). Oxford University Press.

Edelman, A., & Smith, A. (2020). Biden says Trump can't stop violence he has "fomented" for years. *NBC News*. August 31 https://www.nbcnews.com/politics/2020-election/biden-say-trump-can-t-stop-violence-because-he-has-n1238858.

Fiorina, M. P. (2017). *Unstable majorities: Polarization, party sorting, and political stalemate*. Hoover Press.

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science, 2*(2), 156–168.

Gauchat, G. (2012). Politicization of science in the public sphere. *American Sociological Review, 77*(2), 167–187. https://doi.org/10.1177/0003122412438225.

Glueck, K., & Ember, S. (2020). Joe Biden and Bernie Sanders rebuke Trump over virus: "The clock is ticking.". *New York Times*. March 12 https://www.nytimes.com/2020/03/12/us/politics/joe-biden-coronavirus.html.

Gollwitzer, A, Martel, C, Brady, W, Pärnamets, P, Freedman, I, Knowles, E, & Van Bavel, J (2020). Partisan differences in physical distancing are linked to health outcomes during the COVID-19 pandemic. *Nature Human Behaviour, 4*, 1186–1197. https://doi.org/10.1038/s41562-020-00977-7.

Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology, 96*(5), 1029–1046. https://doi.org/10.1037/a0015141.

Green, J., Edgerton, J., Naftel, D., Shoub, K., & Cranmer, S. J. (2020). Elusive consensus: Polarization in elite communication on the COVID-19 pandemic. Science Advances, 6(28), eabc2717.

Hart, P. S., Chinn, S., & Soroka, S. (2020). Politicization and polarization in COVID-19 news coverage. *Science Communication*. https://doi.org/10.1177/1075547020950735.

Hersh, E. D. (2013). Long-term effect of September 11 on the political behavior of victims' families and neighbors. *Proceedings of the National Academy of Sciences of the United States of America, 110*(52), 20959–20963. https://doi.org/10.1073/pnas.1315043110.

Hetherington, M. J. (2001). Resurgent mass partisanship: The role of elite polarization. *American Political Science Review*, 619–631.

Iyengar, S., Lelkes, Y., Levendusky, M., Malhotra, N., & Westwood, S. J. (2019). The origins and consequences of affective polarization in the United States. *Annual Review of Political Science, 22*, 129–146.

Jacquet, J., Dietrich, M., & Jost, J. T. (2014). The ideological divide and climate change opinion: "Top-down" and "bottom-up" approaches. *Frontiers in Psychology, 5*, 1458. https://doi.org/10.3389/fpsyg.2014.01458.

Jiang, J., Chen, E., Yan, S., Lerman, K., & Ferrara, E. (2020). Political polarization drives online conversations about COVID-19 in the United States. *Human Behavior and Emerging Technologies, 2*(3), 200–211.

Jost, J. T. (2006). The end of the end of ideology. *American Psychologist, 61*(7), 651–670.

Jost, J. T. (2017). Ideological asymmetries and the essence of political psychology. *Political Psychology, 38*(2), 167–208.

Jost, J. T. (2020). *A theory of system justification*. Harvard University Press.

Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology, 60*, 307–337.

Jost, J. T., Kruglanski, A. W., Glaser, J., Sulloway, F. J., Greenberg, J., Higgins, E. T., … Sidanjus, J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin, 129*(3), 339–375.

Jost, J. T., van der Linden, S., Panagopoulos, C., & Hardin, C. D. (2018). Ideological asymmetries in conformity, desire for shared reality, and the spread of misinformation. *Current Opinion in Psychology, 23*, 77–83.

Kahan, D. M. (2012). Ideology, motivated reasoning, and cognitive reflection: An experimental study. Judgment and Decision making, 8, 407–24.

Kerr, J. R., Schneider, C. R., Recchia, G., Dryhurst, S., Sahlin, U., Dufouil, C., Arwidson, P., Freeman, A. L. J., & van der Linden, S. (2020). Predictors of COVID-19 vaccine acceptance across time and countries. medRxiv. doi:https://doi.org/10.1101/2020.12.09.20246439.

Khubchandani, J., Sharma, S., Price, J. H., Wiblishauser, M. J., Sharma, M., & Webb, F. J. (2021). COVID-19 vaccination hesitancy in the United States: A rapid national assessment. *Journal of Community Health, 46*, 270–277. https://doi.org/10.1007/s10900-020-00958-x.

Kraft, P. W., Lodge, M., & Taber, C. S. (2015). Why people "don't trust the evidence" motivated reasoning and scientific beliefs. *The Annals of the American Academy of Political and Social Science, 658*(1), 121–133.

Leonhardt, D. (2020). A complete list of Trump's attempts to play down Coronavirus. *New York Times*. March 15 https://www.nytimes.com/2020/03/15/opinion/trump-coronavirus.html.

Martelle, S. (April 23, 2020). Wait, Trump wants to 'LIBERATE' Michigan but not Georgia? Los Angeles Times. https://www.latimes.com/opinion/story/2020-04-23/trump-liberate-michigan-but-not-georgia.

McCarty, N., Poole, K. T., & Rosenthal, H. (2016). *Polarized America: The dance of ideology and unequal riches*. MIT Press.

McCright, A. M., Dentzman, K., Charters, M., & Dietz, T. (2013). The influence of political ideology on trust in science. *Environmental Research Letters, 8*(4), Article 044029. https://doi.org/10.1088/1748-9326/8/4/044029.

Merkley, E., Bridgman, A., Loewen, P. J., Owen, T., Ruths, D., & Zhilin, O. (2020). A rare moment of cross-partisan consensus: Elite and public response to the COVID-19 pandemic in Canada. *Canadian Journal of Political Science/Revue canadienne de science politique, 53*(2), 311–318.

Mervosh, S., Lu, D., & Swales, V. (2020). See which states and cities have told residents to stay at home. *The New York Times*. April 20 https://www.nytimes.com/interactive/2020/us/coronavirus-stay-at-home-order.html.

Mooney, C. (2012). *The republican brain: The science of why they deny science–and reality*. John Wiley & Sons.

Morisi, D., Jost, J. T., & Singh, V. (2019). An asymmetrical president-in-power effect. *American Political Science Review, 113*(2), 614–620. https://doi.org/10.1017/S0003055418000850.

Motta, M., Stecula, D., & Farhart, C. (2020). How right-leaning media coverage of COVID-19 facilitated the spread of misinformation in the early stages of the pandemic in the US. *Canadian Journal of Political Science/Revue canadienne de science politique, 53*(2), 335–342.

Nail, P. R., & McGregor, I. (2009). Conservative shift among liberals and conservatives following 9/11/01. Social Justice Research, 22(2–3), 231–240.

Nature. (2010). [Editorial]. Science scorned. *Nature, 467*, 133.

Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., … Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery, 78*, 185–193.

Nisbet, E. C., Cooper, K. E., & Garrett, R. K. (2015). The partisan brain: How dissonant science messages lead conservatives and liberals to (dis) trust science. *The Annals of the American Academy of Political and Social Science, 658*(1), 36–66.

Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology, 70*, 153–163.

Peterson, J. C., Smith, K. B., & Hibbing, J. R. (2020). Do people really become more conservative as they age? *The Journal of Politics, 82*(2), 600–611.

Petty, R. E., & Briñol, P. (2020). A process approach to influencing attitudes and changing behavior revisiting classic findings in persuasion and popular interventions. In J. Forgas, W. Crano, & K. Fiedler (Eds.), *Applications of social psychology* (pp. 82–103). Psychology Press.

Pew (2014). Political polarization in the American public. Retrieved from https://www.pewresearch.org/politics/2014/06/12/political-polarization-in-the-america n-public/.

Pew. (2020). 5 facts about partisan reactions to COVID-19 in the U.S. https://www.pewresearch.org/fact-tank/2020/04/02/5-facts-about-partisan-reactions-to-covid-19-in -the-u-s/.

Pittinsky, T. L. (2015). America's crisis of faith in science. *Science, 348*(6234), 511–512.

Prior, M. (2013). Media and political polarization. *Annual Review of Political Science, 16*, 101–127.

Roozenbeek, J., Schneider, C. R., Dryhurst, S., Kerr, J., Freeman, A. L. J., Recchia, G., … van der Linden, S. (2020). Susceptibility to misinformation about COVID-19 around the world. *Royal Society Open Science, 7*(10), Article 201199. https://doi.org/10.1098/rsos.201199.

Rosenfeld, D. (2020). Political ideology and the outbreak of COVID-19 in the United States. In *PsyArXiv*. https://doi.org/10.31234/osf.io/jrpfd.

Rutjens, B. T., Heine, S. J., Sutton, R. M., & van Harreveld, F. (2018). Attitudes towards science. In Advances in experimental social psychology (Vol. 57, pp. 125–165). Academic Press.

Rutjens, B, van der Linden, S, & van der Lee, R (2021). Science skepticism in times of COVID-19. *Group Processes and Intergroup Relations, 24*(2), 276–283. https://doi.org/10.1177/1368430220981415.

Sears, D. O., & Funk, C. L. (1999). Evidence of the long-term persistence of adults' political predispositions. *The Journal of Politics, 61*(1), 1–28.

Stenner, K. (2009). Three kinds of "conservatism". Psychological Inquiry, 20(2–3), 142–159.

Sterling, J., Jost, J. T., & Hardin, C. D. (2019). Liberal and conservative representations of the good society: A (social) structural topic modeling approach. *SAGE Open, 9*(2), Article 215824401984621. https://doi.org/10.1177/2158244019846211.

Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., … Drury, J. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour, 4*, 460–471.

van der Linden, S., Panagopoulos, C., Azevedo, F., & Jost, J. T. (2021). The paranoid style in American politics revisited: an ideological asymmetry in conspiratorial thinking. *Political Psychology, 42*(1), 23–51.

Washburn, A. N., & Skitka, L. J. (2018). Science denial across the political divide: Liberals and conservatives are similarly motivated to deny attitude-inconsistent science. *Social Psychological and Personality Science, 9*(8), 972–980.

World Health Organization. (2020). COVID-19 virtual press conference - 8 April, 2020 [Transcript]. https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-press-conference-full-08apr2020.pdf.

Yamey, G., & Gonsalves, G. (2020). Donald Trump: A political determinant of Covid-19. The BMJ (Vol. 369). BMJ Publishing Group.

YouGov. (2020a). The economist/YouGov poll. *Available from*. https://docs.cdn.yougov.com/bfiid7tfh3/econTabReport.pdf#page=103.

YouGov. (2020b). The difference between what republicans and democrats believe to be true about COVID-19. https://today.yougov.com/topics/politics/articles-reports/2020/05/26/republicans-democrats-misinformation.

Zhang, R., Li, Y., Zhang, A. L., Wang, Y., & Molina, M. J. (2020). Identifying airborne transmission as the dominant route for the spread of COVID-19. *Proceedings of the National Academy of Sciences, 117*(26), 14857–14863.