Political Endorsements by Scientific Organizations Reduce Trust in Scientific Expertise During COVID-19

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Political Endorsements by Scientific Organizations Reduce Trust in Scientific Expertise During COVID-19

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Abstract

High-profile political endorsements by scientific organizations and publications have been common in recent years, which raises concerns about political backlash against the endorsing organization in particular and scientific expertise in general. In a pre-registered large-sample online controlled experiment, I randomly assign subjects to receive information about *Nature*'s endorsement of Joe Biden for the 2020 U.S. presidential election in the context of the COVID-19 pandemic. Seeing the endorsement message leads to large reductions in self-reported trust in *Nature* among Trump supporters. This distrust translates into lower demand for COVID-related information provided by *Nature*, as evidenced by substantially reduced requests for *Nature* articles on vaccine efficacy and emerging COVID variants when offered. The endorsement also reduces Trump supporters' stated trust in scientists in general, suggesting "reputational externalities" on the scientific community. Treatment effect estimates for Biden supporters are positive but small and often statistically insignificant across outcomes. Finally, I find little evidence that the endorsement is successful at changing subjects' views about Biden and Trump. These results show political endorsement by scientific organizations can undermine public confidence in the endorsing organization and in the scientific community.

Keywords: Polarization, trust in science, endorsement, COVID-19

1 Introduction

Scientific organizations and publications have become increasingly involved in electoral politics. In the run-up to the 2020 U.S. Presidential Election, numerous influential scientific publications, including *Nature*, *Scientific American*, the *Lancet*, the *New England Journal of Medicine*, and *Science*, published editorial pieces criticising then-President Donald Trump's mishandling of the COVID-19 pandemic and his antagonistic attitudes toward science. Most of these journals urged voters to replace Trump. Among them *Nature*, *Scientific American*, and *the Lancet* explicitly endorsed his challenger Joe Biden[1]. It marked the first time *Scientific American* or *the Lancet* made political endorsement. These publications were also joined by 81 American Nobel laureates in endorsing Biden's candidacy[2].

The increased political engagement by scientists raises concerns that their endorsements cause right-wing backlash[3]. Trust in the scientific community has been on the decline in the U.S. for decades, with the most pronounced decline among those on the political right[4][5]. During the COVID-19 pandemic, such skepticism toward scientific expertise reduced compliance with public health intervention[6] and may explain the partisan difference in compliance[7][8], with important implications for public health outcomes[9]. By endorsing a Democratic candidate in a polarizing presidential election during the pandemic, scientists risk intensifying existing distrust from a large segment of the population, particularly because these endorsements were widely reported by conservative media outlets[10][11].

The possibility of a right-wing backlash is consistent with the literature on affective political polarization in the U.S.[12], which often finds that associating individuals or entities with a political party increases out-party animosity toward them, and Bayesian models of information economics and decision theory, which predicts that an agent uncertain about the quality of an information source may judge its quality by the degree to which its messages conform to her prior[13][14][15]. On the other hand, it would not be unreasonable to expect no backlash. Given the prestige of publications such *Nature*, it is unclear if their credibility would be judged on the basis of a political endorsement - in Bayesian terms, there may or may not be enough prior uncertainty with respect to source quality to trigger a substantively meaningful update. In addition, expressed partisan hostilities are sometimes "cheerleading"[16] that does not translate into behaviours when there are stakes such as health risks. Finally, research show that priming Americans about COVID reduces affective polarization[17]. Whether these endorsements have any effects on trust and behaviours is thus an empirical question.

This paper presents findings from a pre-registered online experiment examining the effects of *Nature*'s 2020 endorsement of Joe Biden for U.S. President amid the COVID-19 pandemic. Conducted in late July and early August 2021, the experiment randomly assigned subjects to receive information about *Nature*'s endorsement, while the control group received irrelevant information.

The results show that the endorsement reduced stated trust in *Nature*'s

competence and impartiality among Trump supporters by 0.633 to 0.845 (full-sample) standard deviations. Treated Trump and Biden supporters become two to four times more polarized than control subjects on these stated measures of trust in *Nature*. The effect is greater for subjects who did not expect *Nature* to make an endorsement *ex ante*. The endorsement also significantly dampened Trump supporters' demand for COVID-related information provided by *Nature*. When prompted to acquire information about emerging COVID-19 variants and vaccine efficacy, treated Trump supporters were 38% less likely than control Trump supporters to request stories from *Nature*'s website, indicating the decrease in stated trust has behavioural consequences.

The endorsement also significantly reduced trust in scientists in general among Trump supporters, creating a "reputational externality" on the entire scientific community.

Point estimates for Biden supporters suggest the endorsement may have slightly increased Biden supporters' confidence in *Nature* and scientists, but the estimated effects are substantively small and often statistically insignificant.

Finally, there is little evidence that the endorsement changed subjects' opinions about the two presidential candidates with respect to the issues that the endorsement piece highlights.

In addition to pointing to adverse consequences of well-intentioned political activism in the scientific community, this paper contributes to the literature on scientific communication, the social sciences of trust in scientific expertise[18][19][4][20][21], on political endorsement[22][23][24][25], non-political consequences of political polarization in the U.S.[7][26][27][28][29][30], and the social and behavioral sciences of COVID-19 response[31]. To the best of my knowledge, this paper presents the first experimental study of the effects scientists' political activities have on trust in scientists. (For an observational study on public opinion effects of the 2017 March for Science rallies, see [20].). In addition, though political endorsements have been extensively studied, no previous work has examined the effect of endorsements on the endorser or public perceptions thereof. This study fills this gap.

2 Results

2.1 The experiment

The experiment took the form of an online survey with randomized components. At the beginning of the survey, subjects were screened for attention and asked about their political beliefs. The experimental sample consists of 4,260 individuals and is representative of the U.S. adult population along most demographic dimensions (Supplementary Table 1). However, the sample is skewed toward Biden supporters, as indicated by responses to a (pre-treatment) question asking subjects their preference between Biden and

Trump. 55.14% of the subjects preferred Biden, while 35.06% favoured Trump.

Scientific journal *Nature* endorsed Joe Biden

- Weeks before the 2020 presidential election, ***Nature***'s editorial board officially endorsed Joe Biden, citing:
  - Donald Trump's pandemic response had been "disastrous";
  - Biden, unlike Trump, would listen to science, and thus;
  - Biden would handle the COVID-19 pandemic better.


EDITORIAL · 14 OCTOBER 2020

Why *Nature* supports Joe Biden for US president

We cannot stand by and let science be undermined. Joe Biden's trust in truth, evidence, science and democracy make him the only choice in the US election.

PDF version

Related Articles

Why Nature needs to cover politics now more than ever

What a Joe Biden presidency would mean for five key science issues

(Reference: The full endorsement can be found here: https://www.nature.com/articles/d41586-020-02852-x)

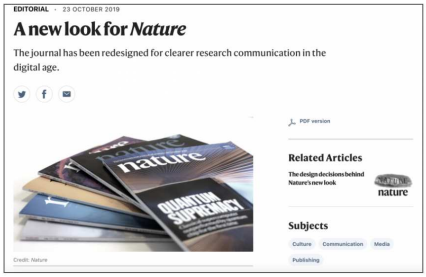
- ***Nature*** is one of the most-cited and most prestigious peer-reviewed scientific journals in the world.

nature

Fig. 1 Treatment message

Scientific journal *Nature* unveiled its new design

- In October 2019, ***Nature***'s editorial board unveiled a new design for the scientific journal, including:
  - New print and digital designs:
  - A new logo.
- The editors hope the redesign will help the journal to communicate research with style and greater clarity.


EDITORIAL · 23 OCTOBER 2019

A new look for *Nature*

The journal has been redesigned for clearer research communication in the digital age.

PDF version

Related Articles

The design decisions behind Nature's new look

Subjects

Culture Communication Media Publishing

Credit: Nature

(Reference :The full announcement can be found here: https://www.nature.com/articles/d41586-019-03167-2)

- ***Nature*** is one of the most-cited and most prestigious peer-reviewed scientific journals in the world.

nature

Fig. 2 Control message

To examine the effect of *Nature*'s endorsement, I randomly assigned half of the subjects to read a short message summarizing *Nature*'s endorsement piece for Biden (Figure 1). The message highlights *Nature*'s criticism of Trump's mishandling of COVID-19 and the expectation that Biden would do better. To make sure the message is credible, the summary is followed by a screenshot of the endorsement piece's title, lead paragraph, and cover picture from *Nature*'s official website, as well as a link to the piece. Finally, subjects are reminded that *Nature* is "one of the most cited and most prestigious peer-reviewed scientific journals in the world".

Control subjects are assigned to read a message about *Nature*'s announcement of its new visual designs for its website and print copies, instead of the endorsement (Figure 2). The message is presented in the same format as the endorsement message that treatment subjects see. The text is also followed by a screenshot and a link to *Nature*'s announcement of the new design, as well as the same reminder of *Nature*'s scientific prominence. Nowhere in the survey are the control subjects informed of the endorsement.

After the treatment or control message, subjects were shown batteries of questions and messages eliciting measures of (1) trust in *Nature*, (2) assessments of Biden and Trump, (3) demand for COVID-19 information provided by *Nature*, (4) persuasiveness of a climate change-related message attributed to *Nature*, and (5) trust in scientists in general.

Analyses are conducted on subjects who indicate some degrees of supports for either Biden or Trump in the aforementioned pre-treatment candidate preference question. This excludes a small minority (8.80%) of subjects who stated that they support "someone else".

2.2 Stated trust in *Nature*

First examined is the effect of seeing the endorsement on stated trust in *Nature*. The survey elicits the subject's confidence in the journal along two dimensions, namely its competence and impartiality. These outcomes are captured by two questions asking subjects to report how much they trust *Nature* for (1) being "*informed*" when it comes to providing advice on science-related issues facing the society, and (2) giving their "*unbiased*" opinions to the public, to the best of their knowledge, when contentious issues are concerned. The questions and the distributions of responses by political alignment and treatment status are presented in Figures 3 and 4.

Table 1 reports the results from regression analyses of the treatment effects. The responses to the two questions are mapped into five-point scales and, as are all other outcomes analyzed in Table 1, standardized as z-scores with mean 0 and standard deviation 1. The endorsement has large negative effects on Trump supporters' trust in *Nature*'s competence ($p < 0.001, 95\%\ CI = [-0.955, -0.752]$) and impartiality ($p < 0.001, 95\%\ CI = [-0.730, -0.534]$). The effects on Biden supporters are positive but small, significant only for the "informed" outcome ($p < 0.001, 95\%\ CI = [0.047, 0.169]$). Taken together, the endorsement

appears to have further polarized trust in *Nature*.

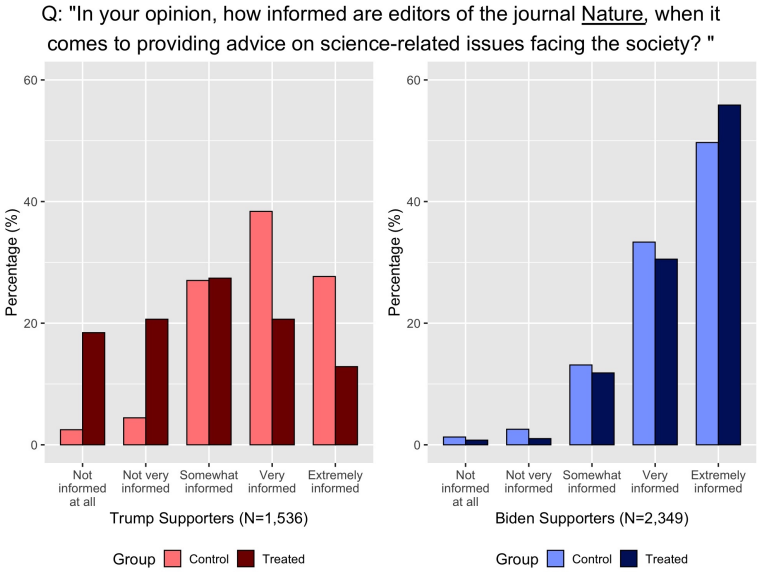


Fig. 3 Stated trust in ***Nature*** being "informed"

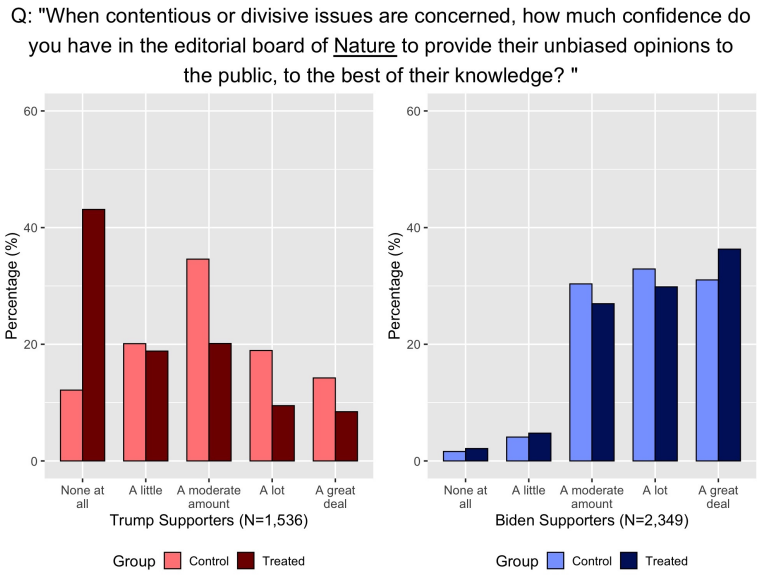


Fig. 4 Stated trust in ***Nature*** being "unbiased"

Table 1 Experiment results

	$\widehat{CATE}$		
Outcome z-score	Trump supporters (Robust s.e.)	Biden supporters (Robust s.e.)	Baseline difference (Robust s.e.)
Nature is informed when providing advice	-0.854***	0.108***	-0.387***
	(0.0518)	(0.0309)	(0.0386)
Nature is unbiased on contentious issues	-0.633***	0.0450	-0.655***
	(0.0498)	(0.0313)	(0.0399)
Biden would have handled COVID better than Trump had he been president in 2020	0.0556+	0.0448+	-1.642***
	(0.0322)	(0.0238)	(0.0282)
Trump would have handled COVID better than Biden if he was still president now(2021)	-0.0241	-0.0168	1.628***
	(0.0329)	(0.0240)	(0.0287)
Biden is better at making use of scientific knowledge for decision-making than Trump	0.0449	0.0135	-1.775***
	(0.0354)	(0.0140)	(0.0267)
Subject requests *Nature*'s article for info about vaccine efficacy against new variants	-0.285***	0.048	-0.386***
	(0.0463)	(0.0409)	(0.0455)
U.S. scientists are informed when providing advice	-0.130*	0.0485	-0.756***
	(0.0532)	(0.0335)	(0.0442)
U.S. scientists are unbiased on contentious issues	-0.161**	0.0161	-0.937***
	(0.0516)	(0.0310)	(0.0422)
"≥90%" of climate scientists agree human-caused climate change is real	-0.0461	0.0265	-0.590***
	(0.0558)	(0.0350)	(0.0463)
Human-caused climate change is real	-0.0232	0.0147	-0.974***
	(0.0582)	(0.0266)	(0.0456)

$N = 3,885$" $\widehat{CATE}$ Trump (Biden) supporters" is the estimated treatment effect for Trump (Biden) supporters. "Baseline difference" is the mean difference between Trump supporters and Biden supporters within the control group. Sample includes 1,173 control Biden supporters, 1,176 treatment Biden supporters, 766 control Trump supporters, and 770 treatment supporters. Outcomes are z-scores with mean 0 and standard deviation 1. All estimates are from OLS estimation of a linear regression model, described in the Method section. Robust standard errors in parentheses. All null hypotheses are testing are two-sided t tests. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The estimates suggest that the polarizing effect of the endorsement is greater than the baseline difference between Biden supporters and Trump supporters. Untreated, Trump supporters' confidence in *Nature*'s competence and impartiality is 0.387 ($p < 0.001, 95\%\ CI = [0.577, 0.734]$) and 0.655 ($p < 0.001, 95\%\ CI = [0.311, 0.463]$) standard deviations lower than Biden supporters', respectively. The treatment pulls them apart by an additional 0.962 standard deviations ($p < 0.001, 95\%\ CI = [0.844, 1.080]$) and 0.678 standard deviations ($p < 0.001, 95\%\ CI = [0.562, 0.793]$), respectively. Depending

on the measure looked at, the treatment increases the trust gap between the two categories by a factor of 2 or 3.5.

Theoretically, the effect of the message should be greater for individuals who did not expect *Nature* to make political endorsements *ex ante*, as the treatment induces in them larger updates of beliefs. I elicited subjects' prior beliefs by asking how likely they thought it was that *Nature* made any political endorsement in the 2020 Presidential Election, before showing the treatment or control message. Figure 5 presents estimated effects on trust in *Nature* for each prior belief level.

For Trump supporters, not expecting the endorsement is clearly associated with larger decrease in trust when told that *Nature* did endorse Biden. The linear interactions between prior belief and treatment are significant for both trust in competence ($p = 0.002$) and in impartiality ($p = 0.025$). Among Biden supporters, the size of the estimated increase in trust in *Nature*'s knowledge also seems larger for those who thought endorsement was unlikely, but the interaction is statistically insignificant. There is no discernible pattern in effects on Biden supporters' trust in *Nature*'s impartiality, which is unsurprising given that the aggregate effect on this outcome is not significant for them.

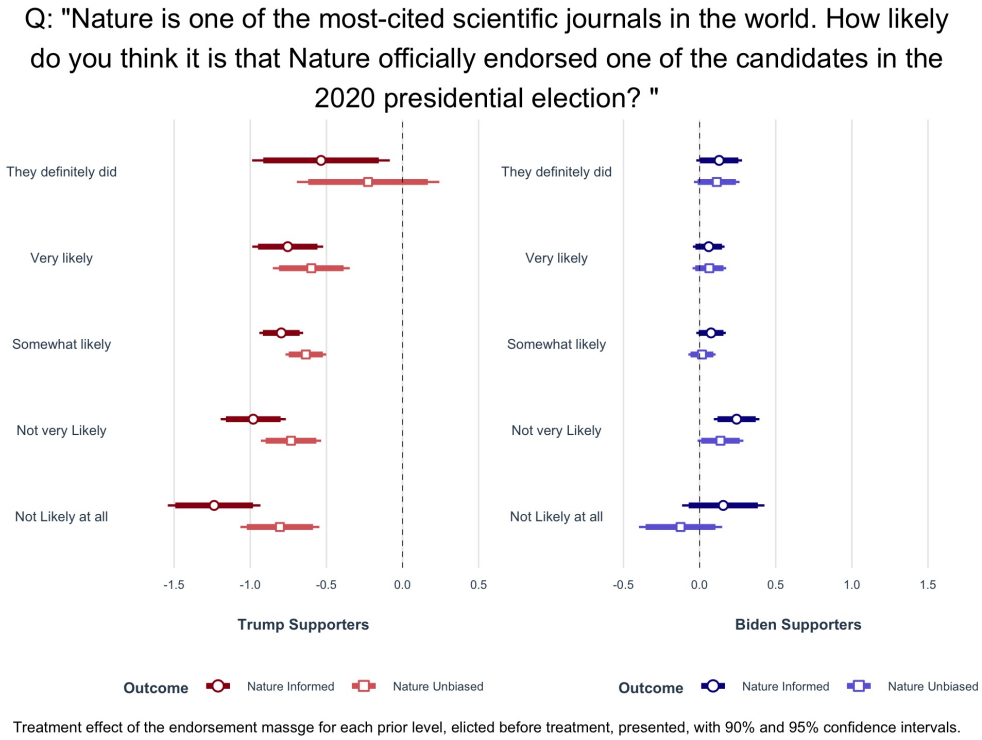


Fig. 5 Treatment effect heterogeneity by prior belief

2.3 Endorsement persuasiveness

I look into whether the endorsement was successful at changing people's minds about Biden and Trump's relative competence by focusing on the issues that the endorsement highlights, namely pandemic response and attitudes toward science. The next three rows of Table 1 report the findings. There is little evidence that the endorsement persuades subjects. In addition to the general absence of statistical significance, the upper bounds of the 95% CIs never exceed 0.12 standard deviation and are typically much smaller.

The construction of these questions is fairly conducive to finding persuasive effects. COVID-19 and science are the focuses of the endorsement message. If the message fails to change Americans' views on these specific issues, it is even less likely that it shifts overall opinions about the race, let alone changing vote intentions.

2.4 Demand for information

Do the shifts in stated trust in *Nature* translate into changes in behaviours such as demand for COVID-related information provided by *Nature*? To study this question, I look at how subjects choose to acquire information from a menu of sources. I prompted subjects with a message reminding them of emerging COVID variants and encouraging them to "stay informed about vaccine efficacy against new COVID variants" (see Supplementary Information for the survey instrument). The topic, which was salient and affected everyone's health and safety, was chosen to increase the stake of the choice. As the situation was rapidly changing, most people were unlikely to have kept track of it and likely to want to learn more.

The message offers links to "easy-to-read" articles about "new variants and how well available vaccines perform against them" from a variety of sources. Specifically, subjects can choose to read from *Nature*, the Mayo Clinic, (unspecified) "news media websites", any combination of the three sources, or not to read about the topic at all.

The endorsement led to a statistically significant 14.2-percentage point reduction in the frequency at which Trump supporters request *Nature* articles ($p < 0.001, 95\%\ CI = [-18.750, -9.688]$) - a 38.3% decline relative to control Trump supporters, who requested *Nature* articles 37.1% of the time. Biden supporters, on the other hand, selected *Nature* 56.4% of the time under the control condition. The estimated treatment effect for Biden supporters is positive but small and statistically insignificant. The z-score versions of these results are presented in Table 1.

It is worth noting that the experiment was conducted early during the Delta variant-induced surge of U.S. cases in summer 2021, when the variant first became salient in Americans' consciousness. Google Trends[32] shows that U.S. search frequencies for keywords "Delta" and "variant" was at their all-time peak when the experiment was conducted (July 28 - August 10). The

search frequency for "vaccine" also reached a local peak. Given the thirst for information on this topic at the time, it is all the more telling that Trump supporters became substantially less likely to want to read about it from *Nature* after exposure to the endorsement information.

2.5 Trust in scientists in general

Next, I consider possible reputational externalities on the scientific community. Namely, the endorsement may affect trust not just in *Nature*, but also in scientists generally. The next set of outcomes are based on a pair of questions that closely parallel the two questions about trust in *Nature*'s knowledge and impartiality, with "*Nature*" replaced by "U.S. scientists".

Figures 6 and 7 show distribution of responses by group. Under the control condition, Trump supporters were less likely to report high levels of trust toward U.S. scientists than Biden supporters, and the gap is larger for treated subjects. Regression analyses reported in Table 1 show statistically significant negative treatment effects for Trump supporters ($\beta^{informed} = -0.130, p = 0.015, 95\%\ CI = [-0.234, -0.026]$; $\beta^{unbiased} = -0.161, p = 0.002, 95\%\ CI = [-0.262, -0.060]$), albeit considerably smaller than the corresponding effects on trust in *Nature*. The estimates for Biden supporters are positive but small and statistically insignificant.

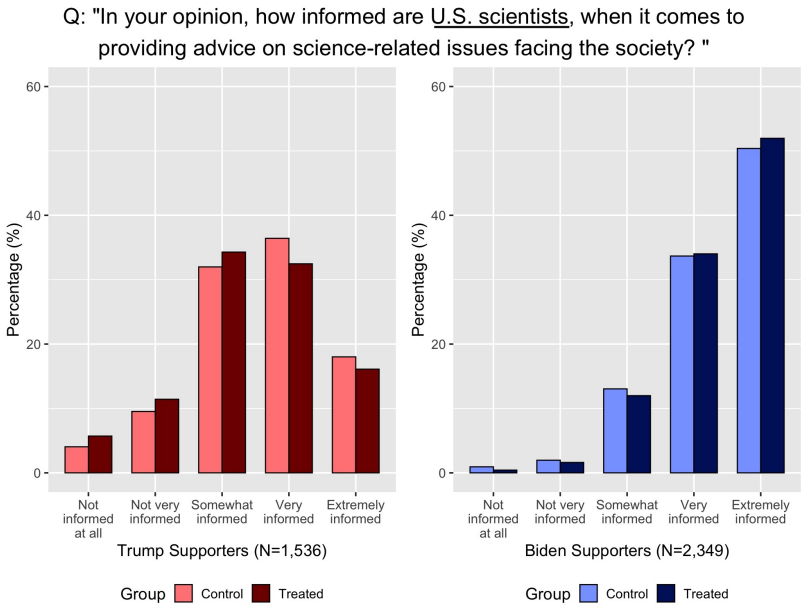


Fig. 6 Stated trust in **U.S. scientists** being "informed"

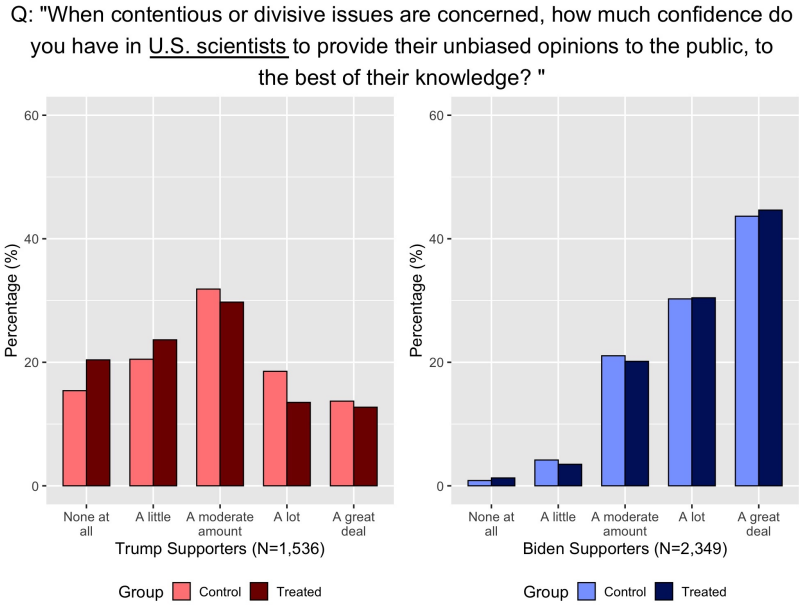


Fig. 7 Stated trust in **U.S. scientists** being "unbiased"

2.6 Climate Change

I also examine whether the endorsement affects *Nature*'s credibility when it communicates scientific consensus on other domains. The questionnaire displays a quote from an editorial piece by *Nature Climate Change*, stating that 97% of climate scientists agree that climate change is real and caused by human activities. (On the questionnaire, the quote was mistakenly attributed to *Nature* instead of *Nature Climate Change*, due to the author's misunderstanding of the distinction at the time.) The treatment group were again reminded that *Nature* endorsed Biden. Subjects were then asked if they believe the statement about climate scientists' consensus and if they believe in human-caused climate change. The signs of all estimates are consistent with results for trust in *Nature*, but the effects are small and insignificant (Table 1).

3 Discussion

This study shows that electoral endorsements by scientific organizations reduce public trust in the endorser, particularly among supporters of the out-party candidate. The effect has negative impacts on trust in the scientific community as a whole and information acquisition behaviours with respect to critical public health issues. Positive effects among supporters of the endorsed candidate are null or small, and they do not offset the negative effects among the opposite camp. This likely results in a lower overall level of

public confidence and more polarization. There is little evidence that seeing the endorsement message changes opinions about the candidates, even if one focuses narrowly on the science-related issues that the message emphasizes. These findings suggest, if the objective is shaping public opinions and the political environment in a way that is conducive to scientific endeavours and evidence-based policies, scientific organizations giving political endorsements may have substantial downsides and little upsides.

The findings are not a results of Biden's relative unpopularity since late 2021. The experiment was conducted in late July and early August 2021, when Biden's approval rating was above 50% and only slightly below its peak[33]. Further, a pilot study I conducted found qualitatively similar effects in May 2021, when Biden's overall popularity was still at its "honeymoon" level, with 71% of Americans, including 47% of Republicans, approved his handling of COVID[34].

The findings have implications beyond this specific context. Education has been playing an increasingly important role in political alignment across Western democracies over the past several decades[35]. In such settings, scientists and science skeptics are likely, more than ever, represented by opposing sides of the partisan divides. Dynamics similar to the one studied here may thus play out in other times and places[36][37].

4 Methods

4.1 Pre-Registration

The experiment is double-registered as AEARCTR-0007007 (American Economics Association RCT Registry) and 10.17605/OSF.IO/SJUPQ (Open Science Foundation Registry). The former was pre-registered before the experiment launched; the latter was pre-registered during the response collection period and before I first accessed or analyzed any portion of the data. The contents of the two registrations do not have any substantive differences.

The only deviation from the pre-registered protocol is the sample size. The pre-registration states that 4,000 responses would be collected, that is, after attention screening but before excluding participants who are neither "Biden supporters" nor "Trump supporters" from analyses. Although I explicitly requested only 4,000 responses from Lucid Theorem, by the time I downloaded and started analyzing the data, 4,260 responses had already been collected. All analyses presented are based on this larger-than-expected sample. This deviation is small in magnitude, and restricting my analysis to the first 4,000 responses collected does not alter the findings in any substantively meaningful way.

Two additional analyses specified in the pre-analysis plan, namely multiple testing adjustments and lasso regression adjustments with covariates, are presented in the Appendices A and B to keep the main text concise, as the findings are not meaningfully different from what is in the main texts.

4.2 Sample

The experiment took place between July 28 and August 10, 2021 and was conducted using a national (U.S.) sample of 4,260 individuals who had been screened for attention. Subjects were invited to share their opinions "in a survey about current events" and participated voluntarily by signing a consent document. The sample was recruited from Lucid, which helps researchers build samples representative of the U.S. adult population along targeted demographic dimensions, with two caveats: First, the distribution of characteristics *not* targeted by Lucid Theorem may not reflect that of the population. For example, Democrats tend to be over-represented in Lucid Theorem samples. Second, the attention check I placed, which screens out inattentive subjects, could potentially alter the distribution if attention is correlated with other subject characteristics.

In practice, however, the second caveat does not seem to pose a meaningful challenge to the representativeness of my sample. Supplementary Table 1 shows post-attention check sample breakdowns by key demographic and geographical categories, which broadly mirrors that of the U.S. adult population. However, as Supplementary Table 2 shows, the sample does not seem representative with respect to political leaning. Specifically, Biden supporters are likely over-represented, if the 2020 presidential election result is taken as the benchmark. It is worth pointing out that this skewed distribution is not the result of screening for attention, but rather due to Democrats being regularly over-represented in Lucid Theorem samples.

4.3 Subject attention

The sample described above is the result of screening out inattentive respondents. A grid of questions are placed before the treatment and consists of three substantive questions and three attention checks. To pass the check, a participant must answer all three attention checks "correctly". The attention check asks if subjects agree or disagree with the following statements (1) "Vermont is LESS populous than California. " (passable answers: "Strongly Agree", "Agree", "Neither Agree Nor Disagree", or "Don't Know") ; (2) "Please select 'Disagree'" (passable answer: "Disagree"); and (3)"Two plus one equals three", (passable answers: 'Strongly Agree" or "Agree"). To make the attention screening less apparent to inattentive subjects, the survey mixes these questions with three substantive questions about subjects' interests in science and current events. The check had a passing rate of 72.29% - of the 6,170 respondents who entered the survey, 1,710 failed the attention checks and were screened out from the study. Of the 4,460 subjects who passed the attention heck, 200 did not complete the survey and were excluded from the analyses.

4.4 Randomization

The treatment was randomized on the individual level and blocked on prior political position (Supplementary Table 2) to ensure finite sample balance.

The randomization was implemented with Qualtrics randomizers. There are five blocks. One half of the subjects in each block received the treatment.

4.5 Analysis

Throughout the analyses, I focus on heterogeneity by subjects' baseline political opinion, particularly by whether they support Biden or Trump. This opinion is elicited by a pre-treatment question about their "hypothetical vote intention" asking who they would vote for if they "were to choose again" between Biden and Trump (since the study took place many months after the election). The distribution of answers among subjects who passed the attention check is reported in Supplementary Table 2. A majority 55.14% of the subjects responded either "Definitely Biden" or "Probably Biden". I label them "Biden supporters". 35.06% favoured Trump and are thus labelled "Trump supporters". 8.80% answered "Someone else". In my analysis, I drop the 8.80% who stated that they would vote for "someone else", since there is no clear interpretation for their pre-treatment political alignment.

4.5.1 Statistical information

The experimental data is analyzed by estimating the following linear regression model:

$$Y_i = \alpha + \beta D_i \times TS_i + \gamma D_i \times (1 - TS_i) + \delta TS_i + \epsilon_i \tag{1}$$

where Y_i is the outcome for subject i; D_i is a dummy variable indicating subject i is in the treatment group; TS_i is a dummy variable indicating i is a Trump supporter; ϵ_i is a heteroskedastic error term.

This specification is chosen, among various equivalent models, for its ease of interpretation. In particular, since I drop subjects who are coded as neither 'Trump supporter" nor "Biden supporters", the omitted category is control Biden supporters. β and γ thus represent treatment effects for Trump supporters and for Biden supporters respectively. δ is the baseline difference between the two categories. In Table 1, estimates of β, γ and δ are presented in columns 1, 2, and 3, respectively. The analyses reported in Table 1 and the main text do not use any covariates in additions to the variables included in Equation 1.

4.6 Manipulation check

The following manipulation check is placed after the last outcome question, near the end of the survey, to examine if the treatment is successful at informing subjects of *Nature*'s endorsement.

> Did the scientific journal Nature make any explicit political statements in support of any candidates in the run-up to the 2020 presidential election?

- No, they did not.

- Yes, they endorsed Joe Biden.
- Yes, they endorsed Donald Trump.
- Don't know.

Experimental data shows that the treatment produced a large and statistically highly significant shift in the rate at which subjects answer "Yes, they endorsed Joe Biden.". Among Biden supporters, 68.79% treated subjects correctly answered that *Nature* endorsed Biden - a 43.47-percentage point shift ($p < 0.001$, two-tail t test) relative to control Biden supporters, who answered correctly 25.32% of the time. The magnitude of the shift is remarkably similar among Trump supporters, albeit from a lower baseline. Treated Trump supporters answered correctly 58.57% of the time, 45 percentage points ($p < 0.001$) more frequent than the 13.58% baseline among control Trump supporters. Despite starting from different baselines, Biden supporters and Trump supporters were similarly receptive to the message - there is no statistically significant difference in the magnitude of the shift between Biden and Trump supporters ($p = 0.594$). Thus, any heterogeneity in treatment effects on outcomes is not due to differential compliance to the treatment.

Supplementary information. Supplementary information is provided in the form of a pdf file, which contains supplementary tables reporting sample summary statistics and additional analyses (lasso regression adjustment and multiple comparison correction, see Appendices A and B for descriptions) and a copy of the survey instrument.

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Author contribution. Floyd Jiuyun Zhang conceived, conducted, analyzed, and interpreted this study, as well as wrote this manuscript.

Declarations

The author is not aware of any competing interests.

The ethics of the study protocol was approved by Stanford University Research Compliance Office (Protocol number: 60462).

Appendix A Lasso regression adjustment

During the experiment, a rich set of covariates were collected, including information on the subject's political ideology, age, gender, U.S. state of residence, race/ethnicity, education attainment, subject of post-secondary study

(STEM or not), religion, residential setting (urban/suburb/rural), interest in current events, and interest in popular science reading. For simplicity and transparency, analyses presented in the main text do not make use of these information. In this appendix, I present treatment effect estimates with regression adjustments using these information to reduce estimator variance.

To efficiently select relevant covariates for each outcome, I use the lasso regression[38] to regularize the coefficients, in accordance to my pre-analyzed plan. Specifically, I employ the lasso regression adjustment method proposed by Wager *et al*[39] to separately estimate the treatment effects on Biden supporters and on Trump supporters. The results are presented in Supplementary Table 3. The adjustments reduce standard errors modestly and do not meaningfully alter the point estimates. The significance levels of the treatment effects are mostly unchanged, with two exceptions. Without adjustments, the estimated effects on trust in *Nature*'s impartiality and U.S. scientists' competence for Biden supporters are statistically insignificant at the conventional level ($p = 0.151$ and $p = 0.148$ respectively). With lasso regression adjustments, they become significant at the 0.05 ($p = 0.032$) and 0.10 ($p = 0.067$) levels, respectively.

Appendix B Multiple Testings

Supplementary Table 4 reports results of adjusting analyses in the main text for multiple testing using sharpened False Discovery Rate (sharpened FDR) q-values[40][41].

As specified in my pre-analysis plan, I divide all ten outcomes into five mutually exclusive and collectively exhaustive sets, namely "stated trust in *Nature*", "endorsement persuasiveness", "demand for information", "climate Change", and "trust in scientists in general" and, *within each set of outcomes*, I adjust for multiple testing for each of the two following clusters of hypotheses: "the treatment effect for Trump supporters is zero" and "the treatment effect for Biden supporters is zero". This groups 20 hypotheses about treatment effects into 10 clusters, of which two clusters, namely Trump supporters' and Biden supporters' demand for information (from *Nature*), are singletons containing only one hypothesis each and are thus *not* adjusted. Unlike the treatment effects, baseline differences between Biden supporters and Trump supporters are not parts of my pre-registered hypotheses, but analogous sharpened FDR q-values are also reported for completeness. As Supplementary Table 4 makes clear, the corrections do not alter change the results in any meaningful way.

Codes availability statement

Data necessary for interpreting and replicating this study will be made publicly available by the final submission (if accepted). It will also be made available earlier during the review process at editors' and/or reviewers' request.

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