Partisanship Unmasked? The Role of Politics and Social Norms in COVID-19 Mask-Wearing Behavior[†]

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Abstract

Public health officials have faced resistance in their efforts to promote mask-wearing to counter the spread of COVID-19. One approach to promoting behavior change is to alert people to the fact that a behavior is common (a descriptive norm). However, partisan differences in pandemic mitigation behavior mean that Americans may be especially (in)sensitive to information about behavioral norms depending on the party affiliation of the group in question. In July–August 2020, we tested the effects of providing information to respondents about how many Americans, co-partisans, or out-partisans report wearing masks regularly on both mask-wearing intentions and on the perceived effectiveness of masks. Learning that a majority of Americans report wearing masks regularly increases mask-wearing intentions and perceived effectiveness, though the effects of this information are not distinguishable from other treatments.

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Mitigating the COVID-19 pandemic requires individuals to comply with public health directives such as wearing a mask (Howard et al. 2021). Unfortunately, mask-wearing has become a partisan issue. Both former President Donald Trump and conservative media outlets have downplayed the need for and efficacy of various pandemic mitigation measures, including mask-wearing (Yamey and Gonsalves 2020; Calvillo et al. 2020). As a result, Republicans (Ingram et al. 2020; Milosh et al. N.d.) and conservatives (Utych 2021) are considerably less likely to wear masks than Democrats and liberals and often resist messages encouraging them to do so (Gelfand et al. N.d.).

In this environment, how can experts persuade the public to wear masks more often? One promising approach is to alert the public to descriptive norms among an important reference group (Bilancini et al. 2020; Fisher and Karl 2020; Folmer, Kuiper, Olthuis, Kooistra, de Bruijn, Brownlee, Fine and van Rooij 2020; Folmer, Brownlee, Fine, Kuiper, Olthuis, Kooistra, de Bruijn and van Rooij 2020; Kitamura and Yamada 2020; Kooistra and van Rooij 2020). People who know that others in the reference group are engaging in pandemic mitigation behaviors might be more likely to adopt more pandemic mitigation practices themselves. This intervention could be especially effective if people underestimate the strength of a behavioral norm due to highly visible dissent and non-compliance (e.g., protests against mask-wearing and media coverage of the issue).

This paper experimentally tests an intervention that alerts Americans to empirical data on the strength of the behavioral norm in support of mask-wearing. We also tested the effects of providing data on mask-wearing among partisan reference groups by providing data on how often Democrats or Republicans report wearing masks instead.

Our results indicate that telling people most Americans report wearing masks increased self-reported intentions to wear masks and improved the perceived efficacy of masks relative to controls, though these effects were not statistically distinguishable from other treatment conditions. The marginal effects on mask-wearing were significant among Republicans, the partisan group with the lowest levels of mask-wearing intentions, and among participants who did not overestimate rates of self-reported mask-wearing. Finally, despite partisan controversy over the issue, learning about reported mask-wearing behavior among co-partisans or out-partisans did not differentially affect

mask-wearing intentions.

Theoretical approach

Descriptive norms are observed patterns of actions that people take in a particular setting. These norms can have strong effects on behavior because people want to be accepted in social contexts and follow relevant behavioral expectations, which they can generally accomplish by acting like everyone else (Christensen et al. 2004; Cialdini, Kallgren and Reno 1991).

By the time our study was conducted, mask-wearing had become common. In a June 25–July 12, 2020 survey conducted about a month before the experiment reported here, 74% of respondents reported wearing a mask "all of the time" or "most of the time" when they left the house. Our first preregistered hypothesis predicted that making this norm salient by informing people how many Americans say they wear masks would increase mask-wearing intentions (H1A).

People may lack information about the strength of the mask-wearing norm due to, e.g., the media emphasis on a minority of anti-mask activists, living in a community with below-average mask-wearing adherence, or people staying home and not observing public mask-wearing behaviors. We also predicted that the effect of the mask-wearing norm treatment would be particularly strong among people who previously underestimated reported mask-wearing among the public (H1B).

When descriptive norms differ between subgroups, as they do between Democrats and Republicans in pandemic mitigation, people may be especially responsive to in-group behavior (Goldring and Heiphetz 2020). We thus expected that providing information about reported mask-wearing among co-partisans would increase mask-wearing intentions (H2A), particularly among those who previously underestimated mask-wearing among co-partisans (H2B).

To the extent Americans see opposing partisans' motivations and behaviors as suspect (Munro, Weih and Tsai 2010; Waytz, Young and Ginges 2014), they may not wish to follow out-partisans' general patterns of behavior or may even wish to resist out-partisan norms. Therefore, it remains an open question whether exposure to out-partisans' reported mask-wearing tendencies influence indi-

viduals' own intentions to wear masks (RQ1A). How partisans react to over- and under-estimating reported out-partisan mask-wearing is an open question (RQ1B) for the same reasons.

We also ask whether providing information about descriptive norms affects beliefs about the efficacy of masks (RQ2). Descriptive norms can influence behavior independently of underlying beliefs and attitudes about that behavior (Christensen et al. 2004; Cialdini, Kallgren and Reno 1991). Following descriptive norms may reflect an effort to preserve a sense of belonging with others regardless of agreement with the underlying reasons for a behavior (Göckeritz et al. 2010). Alternatively, people who anticipate engaging in a behavior may adopt beliefs and attitudes to justify their actions and avoid cognitive dissonance (Festinger 1957). In this case, exposure to descriptive norms could prompt an update not only of behavioral intentions but also of corresponding beliefs.

Finally, though most Americans report engaging in pandemic mitigation behaviors such as wearing masks, Republicans do so less often (Druckman et al. 2020). Furthermore, GOP opinion leaders are more likely to criticize or disregard masks (Calvillo et al. 2020; Yamey and Gonsalves 2020). As a result, Republican mask-wearing intentions could potentially increase more than Democrats in response to the norms treatments. Alternatively, however, the norms interventions could backfire among Republicans because they conflict with messaging from co-partisan opinion leaders. We therefore explore whether the effect of learning descriptive norms varies by party (RQ3).

Finally, we ask whether learning that the vast majority of Americans report wearing masks, including a majority of out-partisans, might highlight shared cross-party norms and thereby reduce affective polarization (RQ4; Gaertner et al. 1993; Levendusky 2018).

Materials and methods

Experimental manipulation

We conducted this preregistered experiment in the third wave of a multi-wave panel study examining COVID-19 misperceptions in the United States ($n = 2,982$). Data were collected from July 28–August 19, 2020 (see Appendix for additional details about the preregistration and the survey).

At this point in the pandemic, the United States had experienced a summer surge in infections, with seven-day averages peaking at above 65,000 in mid-July and remaining above 45,000 during the data collection period (New York Times 2021). After initially discouraging widespread mask use at the pandemic's outset, the U.S. Centers for Disease Control had changed its guidelines in April 2020, recommending mask wearing in public locations. By mid-July, the CDC published a study suggesting masking curbed the transmission of COVID-19 and strengthened its recommendation to wear masks (Netburn 2021).

Participants in this study were randomly assigned either to a control condition that did not receive information about mask-wearing norms or to one of three treatment conditions. The American norms treatment condition informed respondents of the percentage of Americans (74%) who reported wearing masks "all of the time" or "most of the time." The Democratic norms treatment reported the figure for self-identified Democrats and Democratic-leaning independents (89%) and the Republican norms treatment reported the figure for self-identified Republicans and Republican-leaning independents (56%).[1] Each statistic provided was calculated using data from a question administered during Wave 2 of the survey panel in the general population sample. We recoded the Democratic and Republican norms conditions into co-partisan and out-partisan norms treatments (true independents who do not lean toward a party were excluded from analysis).

It is important to note that the reference group (Americans, Democrats, or Republicans) and reported levels of mask-wearing (74%, 89%, or 56%) simultaneously varied by condition in this design. Reporting the same level of mask-wearing in each reference group would have simplified interpretation but would have been inconsistent with our commitment to provide accurate information to experimental participants and our goal of testing descriptive norm effects under real-world

[1]These values correspond closely to an analogous question from Gallup, which asked "How often do you wear a mask when outside your home (because of the coronavirus outbreak)?" from June 29–July 5, 2020 (Brenan 2020). They found that 72% of Americans reported doing so "Always" or "Very often"; the corresponding figures for Democrats and Republicans were 94% and 46%, respectively.

conditions. We discuss this issue further in the discussion section below.

Outcome measures

After the randomization, respondents indicated their intentions to wear masks, perceptions of the effectiveness of masks, and attitudes toward voters from each political party:

- Behavioral intention to wear masks: "In the future, how often will you do the following? Wear a mask in public" (five-point scale from "Not at all" to "All of the time").
- Perceptions of mask effectiveness: "Please indicate whether you believe the following statement is accurate or not. Masks are an effective way to prevent the spread of coronavirus" (four-point scale from "Not at all accurate" to "Very accurate")
- Affective polarization: Difference between in-party and out-party feeling thermometers for "[p]eople who support Democrats" and "[p]eople who support Republicans" (0–100 scales)

Analytic strategy

We tested our primary hypotheses and research questions using linear regression with HC2 robust standard errors. We used a lasso variable selection procedure to determine the set of prognostic covariates to include in models for each dependent variable (see Appendix for additional details). To limit the risk of false positives (Benjamin et al. 2018), we conduct significance tests using the $p < .005$ and $p < .01$ threshold in addition to $p < .05$ (see Appendix) and report the most stringent standard at which we can reject the null hypothesis in the text. We correspondingly report 95% and 99.5% confidence intervals for treatment effect estimates in each figure.

To assess the precision of any null results we observe for main effects, we report equivalence bounds using a two one-sided tests approach (Lakens, Scheel and Isager 2018). When we observe null estimates of heterogeneous treatment effects, we instead report the coefficient value of the relevant interaction term that our model and sample size can detect with 80% power. These estimates

were obtained using simulations in DeclareDesign assuming the sample size and standard deviation of the residuals observed in our each model (Blair et al. 2019).

Preregistration and survey instruments

Our preregistered hypotheses, research questions, and analysis plan for this experiment is available at `https://osf.io/wyb2e`. Survey instruments are available at `https://osf.io/248af/`. We did not deviate from the preregistration but did conduct additional analyses, which are reported below and labeled as exploratory. All analyses not labeled exploratory are preregistered.

Results

Descriptive results

Table 1 reports descriptive results for respondents' reported levels of mask-wearing, perceived levels of mask-wearing among others, intention to wear a mask in the future, perceptions of mask effectiveness, and levels of affective polarization from our July 28–August 19, 2020 survey wave (the third wave in a multi-wave panel), In this wave, 79.5% of our total sample reported wearing masks most or all the time, including 93.1% of Democrats and 60.1% of Republicans. We define under- and over-estimation of mask-wearing intention as being more than 10 percentage points under or over the percentages of regular mask wearing featured in our treatments.[2] Respondents are much more likely to underestimate reported mask-wearing than overestimate it (48.1% and 8.7%, respectively), although each partisan group underestimates mask-wearing among its opponents far more than among copartisans. Both Democrats and Republican perceive masks to be effective, though perceived effectiveness is greater among Democrats (mean of 3.8 versus 3.0 for Republicans on a four-point scale). Finally, partisans in our sample are highly affectively polarized. On average, they

[2]The descriptive norms statistics in the treatments reported above were estimated from respondents in the previous wave of the survey panel. We used these statistics as the baseline for calculating whether respondents overestimated or underestimated reported mask-wearing.

rate their own party 56.5 points above the other party on 0–100 point feeling thermometers.

Table 1: Descriptive statistics

	Full sample	Democrats	Republicans
Pre-treatment mask-wearing measures			
Report regularly wearing masks	79.5%	93.1%	60.1%
Estimates of American mask-wearing	67.8%	68.5%	67.3%
Estimates of Democrat mask-wearing	78.4%	82.8%	74.6%
Estimates of Republican mask-wearing	53.8%	45.0%	64.3%
Underestimates American mask-wearing by 10% or more	39.1%	32.5%	46.8%
Overestimates American mask-wearing by 10% or more	17.7%	15.6%	14.9%
Underestimates Democratic mask-wearing by 10% or more	47.1%	39.8%	55.9%
Overestimates Democratic mask-wearing by 10% or more	18.1%	16.2%	15.0%
Underestimates Republican mask-wearing by 10% or more	32.1%	48.4%	17.3%
Overestimates Republican mask-wearing by 10% or more	49.3%	33.2%	64.0%
Outcome measures			
Mask-wearing intention	4.4 (1.1)	4.8 (0.7)	3.9 (1.3)
Perceived mask effectiveness	3.4 (0.9)	3.8 (0.6)	3.0 (1.0)
Affective polarization	56.5 (36.4)	58.5 (34.7)	53.2 (38.4)
N	2,982	1,574	945

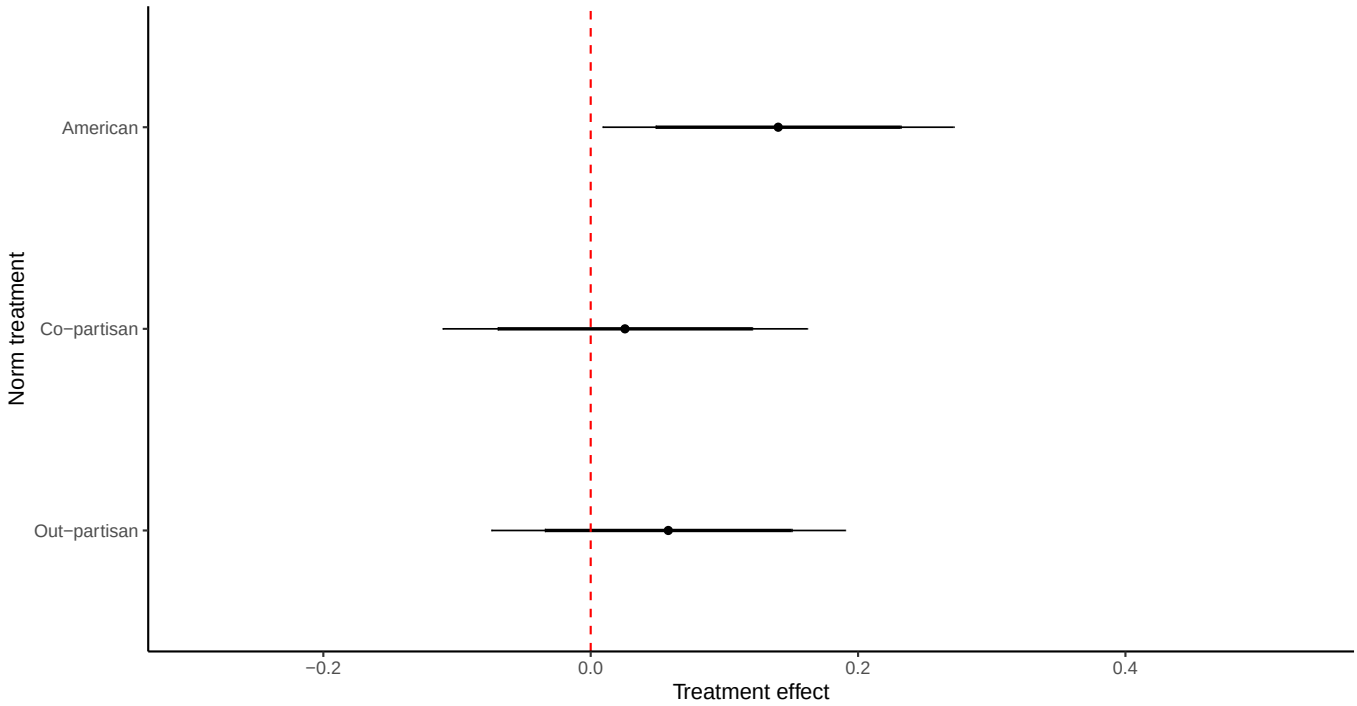
Mask-wearing intention is measured on a five-point scale. Perceived mask effectiveness is measured on a four-point scale. Affective polarization is measured as the difference between the 100-point feeling thermometer ratings of supporters of the respondent's preferred party and the other party. Standard deviations are provided in parentheses.

Experimental results

Our first hypothesis predicted that the American descriptive norms treatment would increase mask-wearing intentions (H1A). The estimated marginal effects of each treatment on mask-wearing intentions are presented in Figure 1 (see Table A1 for corresponding OLS results).[3] Consistent with H1A,

[3]Tables A11–A24 replicate the main analyses using ordered logistic regression and present predicted probabilities of each response outcome for each treatment group. The results are substantively identical to those estimated using OLS, though they indicate that much of the effect of the treatment comes from moving people from intending to wear masks "most of the time" to wearing masks "all of the time."

Figure 1: Effect of norm treatments on mask-wearing intentions



Covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on mask-wearing intentions among partisans. See Table A1 for corresponding OLS results and Table A2 for estimates of the American norms treatment effect among the full sample including true independents. Note: Wave 2 mask-wearing figures differ from treatment wording because this reflects the whole sample, not just the general population sub-sample.

exposure to the true percentage of Americans who report wearing masks regularly increases mask-wearing intentions among partisans by 0.140 points on a five-point scale (d=0.137, $p < .005$).[4] We also predicted that the co-partisan descriptive norms treatment would increase mask-wearing intentions (H2A). However, exposure to the true percentage of co-partisans who report wearing

[4]To maintain consistency in our estimation sample and for expositional clarity, we restrict our analyses in the main text to partisans (including leaners) who could be exposed to any of the three treatments (American, co-partisan, or out-partisan norms). However, we always report corresponding estimates of American norms treatment effects among all respondents in the Appendix. In this case, the estimated effect of the American norms treatment on mask-wearing intentions for the full sample is 0.133 points on a five-point scale (d=.130, $p < .05$; see Table A2).

masks has no measurable effect on mask-wearing intentions ($p > .05$). We estimate equivalence bounds of (-0.135, 0.054) using two one-sided tests — in other words, our results allow us to rule out effects less than -0.135 or greater than 0.054 on a five-point scale. Finally, per RQ1A, exposure to out-partisan mask-wearing had no significant effect on mask-wearing intentions either ($p > .05$; equivalence bounds estimated using two one-sided tests: [-0.178, 0.013]).

In an exploratory analysis, we tested whether these treatment effects differed significantly from one another. Our results indicate that the American descriptive norms treatment had a greater positive effect on mask-wearing intentions than the co-partisan norms treatment ($p < .05$), but we could not reject the null of no difference between the American and out-partisan norms treatments and the co-partisan and out-partisan norms treatments ($p > .05$ for both; equivalence bounds versus out-partisan norms estimated using two one-sided tests: American [-.164, .017], co-partisan [-.050, .134]).[5]

Figure 2 next disaggregates the marginal effects of each treatment by whether respondents underestimated, overestimated, or accurately perceived mask-wearing norms among the reference group corresponding to their treatment condition. We hypothesized that the treatment effect would be especially strong among respondents who underestimated the percentage of Americans who report wearing masks (H1B). Marginal effects are depicted in the left panel of Figure 2 (see Table A3 for corresponding OLS results).[6] However, the estimated impact of the American norms treat-

[5]It is surprising that the effect of the American norms treatment on mask-wearing is stronger than the co-partisan norms treatment but not the out-partisan treatment. We interpret this finding as a the result of the difference in the content of the treatments by party. The American norms treatment was only significant among Republicans (Democrats faced a potential ceiling effect). For this group, the co-partisan treatment presents substantially weaker descriptive norm information (56% report wearing masks) than does the out-partisan treatment (89%). As a result, the strength of the reported norm was weakest for co-partisans.

[6]See Table A4 for estimates of the American norms treatment effect among the full sample including true independents.

ment was not statistically discernible between those who underestimated mask norms and those who accurately estimated them ($p > .05$).[7] In this case, the marginal effect of the American norms treatment on mask-wearing intentions was positive and statistically significant among both those who underestimate reported mask-wearing among the public and those who perceive it accurately ($p < .05$ for those with accurate beliefs, $p < .005$ for underestimators).

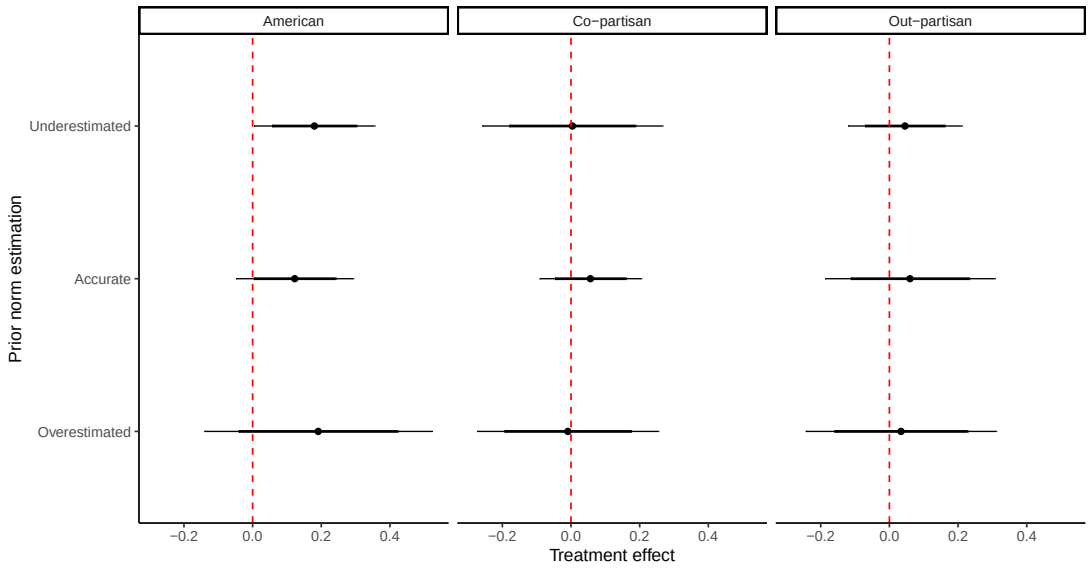
We hypothesized that the co-partisan descriptive norms treatment would be especially effective among those who underestimated reported mask-wearing among co-partisans (H2B). However, as shown in Table A3, we find no evidence to support this hypothesis. The marginal effect of the treatment among underestimators is not measurably different from zero and we cannot reject the null hypothesis of no difference in treatment effects compared to respondents who accurately perceived reported co-partisan mask-wearing behavior ($p > .05$).[8]

We asked whether providing information about the prevalence of mask use among opposition partisans affects behavioral intentions to wear masks compared to the control group (RQ1A). Marginal effects are depicted in Figure 1 (see Table A1 for corresponding OLS results). We find that exposure to the true percentage of opposing partisans who report wearing masks has no significant effect on mask-wearing intentions ($p > .05$; equivalence bounds estimated using two one-sided tests: [-0.178, 0.013]). We further asked whether providing information about the prevalence of mask use among opposing partisans differed by prior beliefs about the prevalence of mask use among opposing partisans (RQ1B). Marginal effects are depicted in the third panel of Figure 2 and Table A3 in the Appendix. We find that the treatment did not affect mask-wearing intentions among respondents who had accurate perceptions of opposing partisan mask-wearing. Moreover,

[7]The estimated value of the American treatment $\times$ underestimated mask norms interaction term in Table A3 was $\hat{\beta} = 0.053$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.330|$.

[8]The estimated value of the co-partisan treatment $\times$ underestimated mask norms interaction term in Table A3 was $\hat{\beta} = -0.037$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.500|$.

Figure 2: Effect of norms treatments on mask-wearing intentions



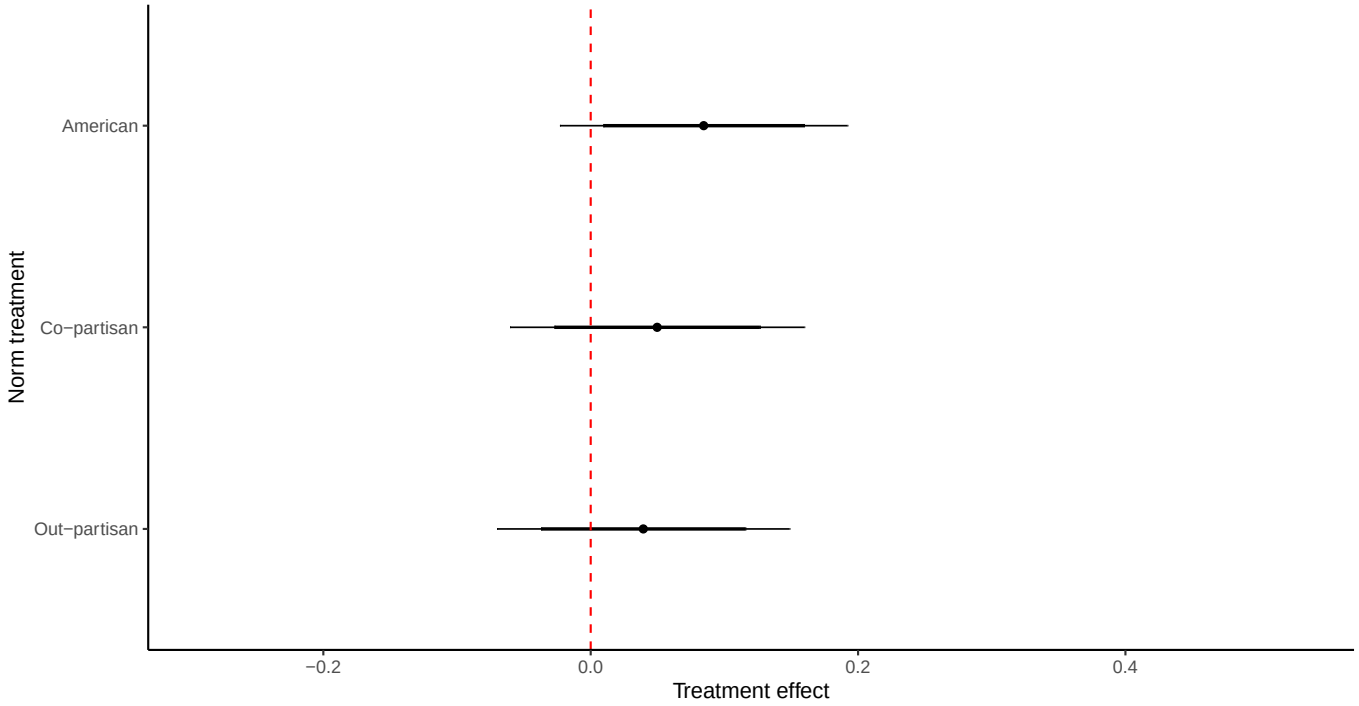
Covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on mask-wearing intentions among partisans. See Table A3 for corresponding OLS results and Table A4 for estimates of the American norms treatment effect among the full sample including true independents.

the out-partisan $\times$ underestimates interaction is not significant ($p > .05$).[9]

We asked whether providing information about the prevalence of mask use among Americans, co-partisans, or opposing partisans affects belief in the efficacy of masks compared to respondents in the control group (RQ2). Treatment effect estimates by condition are depicted in Figure 3 (see Table A5 for corresponding OLS results). We find that the American descriptive norms treatment increased belief in the efficacy of masks among partisans by 0.085 points on a 4-point scale ($p < .05$). However, this finding is sensitive to the presence of covariates when we estimate results both among partisans and for the full sample ($p > .05$ without covariates, $p < .05$ with covariates; see Tables A5 and A6). Moreover, neither the co-partisan descriptive norms treatment nor the out-partisan descriptive norms treatment affect perceived effectiveness of masks among partisans relative to the control ($p > .05$ for each; equivalence bounds estimated using two one-sided tests:

[9]The estimated value of the out-partisan treatment $\times$ underestimated mask norms interaction term in Table A3 was $\hat{\beta} = -0.011$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.320|$.

Figure 3: Effect of norms treatments on perceptions of mask effectiveness

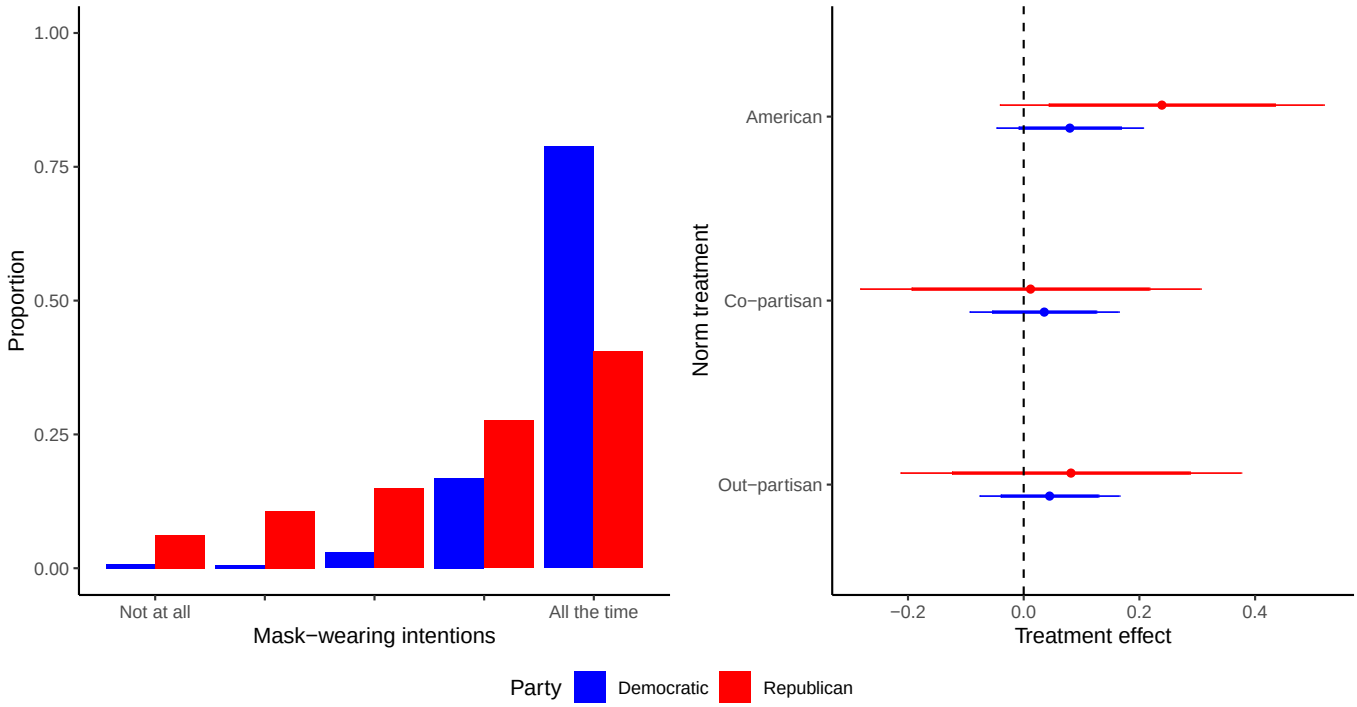


Covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on mask-wearing intentions among partisans. See Table A5 for corresponding OLS results and Table A6 for estimates of the American norms treatment effect among the full sample including true independents.

co-partisan [-0.089, 0.072], out-partisan [-0.057, 0.103]).

We asked whether the effect of each norms treatment differs by party (RQ3). Estimated treatment effects by condition and party are depicted in Figure 4 (see Table A7 for OLS results). We begin examining treatment effects on intent to wear masks. We cannot reject the null of no difference in treatment effects by party — none of the interaction terms are statistically significant ($p > .05$ for

Figure 4: Mask-wearing intentions and norm treatment effects by party



Left panel presents reported mask-wearing intentions by party. Right panel presents covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on mask-wearing intentions by party. See Table A7 for corresponding OLS results.

each).[10] However, the marginal effect of the American norms treatment is only significant among Republicans. Among GOP identifiers and leaners, the treatment increases mask-wearing intentions (d=0.184, $p < .05$), whereas it does not change mask-wearing intentions among Democrats, who

[10]The estimated value of the American treatment $\times$ Republican interaction term for mask-wearing intentions in Table A7 was $\hat{\beta} = 0.159$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.290|$. The estimated value of the co-partisan treatment $\times$ Republican interaction term for mask-wearing intentions in Table A7 was $\hat{\beta} = -0.024$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.290|$. The estimated value of the out-partisan treatment $\times$ Republican interaction term for mask-wearing intentions in Table A7 was $\hat{\beta} = 0.037$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.300|$.

potentially face a ceiling effect given higher baseline levels of mask-wearing intention (see left panel of Figure 4).[11]

We also find no treatment $\times$ party interactions on the perceived effectiveness of masks ($p < .05$ for each; see Figure A1 and Table A7 in Online Appendix A).[12] In this case, though, the marginal effects are null for both Democrats and Republicans.

Finally, we also preregistered research questions exploring whether the descriptive norms treatments would change affective polarization and whether the descriptive norms treatments were moderated by exposure to fact-checks of false claims about COVID-19 in an separate experiment fielded in the same study. Results, which are presented in the Appendix in Tables A8 and A9, respectively, show that the norms treatments did not measurably change partisan affect and fact-check exposure significantly reduced the effect of the American norms treatments in only one of eight estimated models.

Discussion

Can treatments strengthening descriptive norms increase mask-wearing to help mitigate the spread of COVID-19? We find that alerting people to the fact that the vast majority of Americans re-

[11] As noted above, though, the strength of the treatment differed by reference group — specifically, reported levels of mask-wearing were lower for Republican respondents.

[12] The estimated value of the American treatment $\times$ Republican interaction term for mask effectiveness in Table A7 was $\hat{\beta} = 0.062$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.240|$. The estimated value of the co-partisan treatment $\times$ Republican interaction term for mask effectiveness in Table A7 was $\hat{\beta} = -0.052$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.240|$. The estimated value of the out-partisan treatment $\times$ Republican interaction term for mask effectiveness in Table A7 was $\hat{\beta} = -0.009$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.240|$.

port wearing masks regularly is broadly effective in increasing mask-wearing intentions. These marginal effects were significant among Republicans (but not Democrats) and those who previously underestimated or accurately perceived reported mask-wearing rates in the relevant reference group. Finally, learning that most Americans report wearing masks regularly also improves assessments of the effectiveness of masks. These results contribute both to our understanding of the effects of descriptive norms and to social science research investigating COVID-19 behaviors and attitudes.

Importantly, these results suggest that the importance of partisan reference groups in shaping COVID-19 behavior may have been overstated. Learning about rates of self-reported mask-wearing among Americans increased mask-wearing intentions in general and among Republicans. By contrast, learning about the mask-wearing habits of one's co-partisans or opposing partisans has no measurable effect on mask-wearing intentions. However, as we note above, the effects of learning what Americans do are not always statistically discernible from the effects of learning what co-partisans or out-partisans do. Our findings therefore warrant further investigation.

These findings come with another important caveat. In our design, the strength of the co-partisan treatment was limited by moderate levels of reported mask-wearing among Republicans (56% versus 74% for all Americans and 89% for Democrats). We chose to use actual data from a previous survey in the treatments given our goal of testing messages that could potentially be deployed in the real world. However, this decision creates a confound between the group featured in the treatment and the percentage engaging in the descriptive norm behavior (mask-wearing). Future research should seek to isolate in-group effects by keeping the percentage of people who wear masks in treatments fixed across conditions.

Several other important limitations of this research should be acknowledged. First, the severity of COVID-19 spread, the behaviors that people engage in to protect themselves, and perceptions of other people's behavior have varied widely over the course of the pandemic. Future research should seek to replicate these findings under differing conditions. Second, we are unable to measure actual mask-wearing behavior given our reliance on surveys; as in all survey research on health behavior

our results thus depend on the imperfect correspondence between these intentions and the actions take in the real world. The descriptive norm information provided to respondents in our treatments may be less salient than more visible or concrete messages about behaviors in reference groups.

Nonetheless, these findings provide important evidence that even a limited descriptive norms intervention can change mask-wearing intentions during a global pandemic. Despite the deep divides over the response to COVID-19, Americans are sensitive to how other people act and change their intended behaviors accordingly.

Conflicts of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethics statement

This research complies with all relevant ethical regulations and with APSA's Principles and Guidance for Human Subjects Research. The study was approved by the human ethics review board at Dartmouth College (STUDY00032068). The University of Exeter recognized the approved protocol for the North American study. In particular, informed consent was obtained from all participants. At the conclusion of the study, respondents were referred to the Centers for Disease Control and Prevention for more information about COVID-19. The survey vendor, YouGov, compensated participants with reward points that can be redeemed for cash.

Data availability

The data, code, and any additional materials required to replicate all analyses in this article are available at the Journal of Experimental Political Science Dataverse within the Harvard Dataverse Network at https://doi.org/10.7910/DVN/PJ27BB (Carey et al. 2022).

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Appendix: Partisanship Unmasked? The Role of Politics and Social Norms in COVID-19 Mask-Wearing Behavior

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Survey details

4,438 American respondents were initially recruited to a larger multi-wave panel survey from three separate YouGov sampling frames. 2,238 came from YouGov's Pulse panel; 1,096 came from the general YouGov panel; and 1,104 came from areas with a high incidence of COVID. By Wave 3, we retained 2,982 respondents (67%), including 1,532 from the Pulse panel (68%), 774 from the general population (71%), and 676 from the high-incidence group (61%). Respondents filled out Wave 1 on May 20–June 3, 2020; Wave 2 on June 25–July 12, 2020; and Wave 3 on July 28–August 19, 2020. The main experiment took place in the third wave. (Wave 4 was later fielded from March 9–23, 2021.)

Measurement of independent variables

Affective polarization (Wave 3). Respondents filled out 0-100 point feeling thermometers for "People who support Democrats" and "People who support Republicans." We transformed these items to subtract feeling thermometers for the opposing party from feeling thermometers for a respondent's party.

Under- and over-estimation of American and partisan mask-wearing (Wave 3). Prior to the manipulations, respondents were asked "What percentage of Americans/Democrats/Republicans do you think would say they wear a mask in public all or most of the time?" We used respondent partisanship to transform the Democratic and Republican questions into co-partisan and out-partisan questions. We coded respondents as underestimating (overestimating) Americans/co-partisans/out-partisans when their guess was under (over) the true figure by 10% or more, with respondents who were relatively accurate as the reference category.

Party (Wave 1). A 3-point scale of self-proclaimed party identification such that 1=Democratic, 2=Independent, 3=Republican.

Gender (Wave 1). A dichotomous variable that =1 if a respondent is male, 0 otherwise.

Ideology (Wave 1). A 7-point scale of ideological identification such that 1=very liberal, 4=moderate; middle of the road, and 7=very conservative.

Trust in health institutions (Wave 1). Respondents filled out five items on the amount of trust they have in health institutions on 4-point scales from 1 (not at all) to 4 (a lot). Three concerned trust in governmental health institutions to handle the coronavirus outbreak with the stem "How much do you trust the following people and organizations to do the right thing to best handle the coronavirus outbreak?" "Hospitals and doctors," "Scientists and researchers," "Centers for Disease Control and Prevention (CDC)." They also filled out two items on trust in information from governmental health institutions with the stem "How much, if at all, do you trust the information you get from..." "Health experts in the state government?" "Health experts in the federal government?" (α=.80)

Trust in the media (Wave 1). Respondents filled out two items on trust in the media on 4-point scales from 1 (not at all) to 4 (a lot) with the following stem: "How much, if at all, do you trust the information you get from..." "National news organizations?" "Local news organizations?" (r=.65, α=.77)

Political interest (Wave 1). A five-point scale from not at all interested (1) to extremely interested (5).

Lasso regression

The eligible covariates included education, age, gender, marital status, church attendance, region, party, ideology, living in a high incidence COVID area, CRT score, political knowledge, race, trust in health institutions, and trust in the media. Using the lasso regression, we find men, Republicans, and those who were more conservative had significantly lower mask-wearing intentions, while those who trusted health institutions had significantly higher mask-wearing intentions. We also find that Republicans and those who were more conservative perceived masks as significantly less effective, while those who trusted health institutions and the media considered masks more effective as a pandemic mitigation tool. Lastly, we find conservatives displayed significantly lower affective polarization, while those reporting higher political interest displayed higher affective polarization. Therefore, we control for gender, party, ideology and trust in health institutions in models of behavioral intentions; party, ideology, trust in health institutions and media trust in models of perceived mask-wearing effectiveness; and ideology and political interest in models of affective polarization.

H1A/H2A/RQ1A: Main effects of norms treatments

Table A1: Treatment effects on mask-wearing intentions among partisans

	(1)	(2)
American norms treatment	0.116*	0.140***
	(0.054)	(0.047)
Co-partisan norms treatment	−0.041	0.026
	(0.057)	(0.049)
Out-partisan norms treatment	0.042	0.058
	(0.056)	(0.047)
Male		−0.162***
		(0.034)
Republican		−0.177***
		(0.028)
Conservatism		−0.047***
		(0.012)
Health trust		0.570***
		(0.045)
Constant	4.367***	3.431***
	(0.039)	(0.130)
N	2,519	2,513
R^2	0.003	0.287

OLS regression with robust standard errors in parentheses; ***p<0.005, **p<0.01; *p<0.05.

Table A2: Effect of American norms treatment on mask-wearing intentions (control/American norms conditions only)

	(1)	(2)
American norms treatment	0.127^{*}	0.133^{*}
	(0.052)	(0.045)
Male		-0.153^{***}
		(0.046)
Partisanship		-0.159^{***}
		(0.037)
Conservatism		-0.050^{***}
		(0.016)
Health trust		0.574^{***}
		(0.053)
Constant	4.308^{***}	3.401^{***}
	(0.038)	(0.151)
N	1,488	1,470
R^2	0.004	0.260

OLS regression with robust standard errors in parentheses; $^{***}p<0.005$, $^{**}p<0.01$; $^{*}p<0.05$. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

H1B/H2B/RQ1B: Norms treatment effects by prior norms estimations

Table A3: Treatment effects on mask-wearing intentions by prior norm estimates among partisans

	(1)	(2)
American norms treatment	0.097	0.123*
	(0.067)	(0.061)
Co-partisan norms treatment	−0.013	0.057
	(0.067)	(0.053)
Out-partisan norms treatment	0.051	0.060
	(0.109)	(0.088)
Underestimates American norm	−0.299***	−0.126*
	(0.052)	(0.042)
Underestimated co-partisan norm	−0.301***	−0.204***
	(0.059)	(0.046)
Underestimates out-partisan norm	0.326***	0.179***
	(0.058)	(0.046)
Overestimates American norm	0.254*	0.125
	(0.068)	(0.069)
Overestimates co-partisan norm	−0.332***	0.435***
	(0.053)	(0.063)
Overestimates out-partisan norm	0.169*	0.022
	(0.068)	(0.056)
American treatment × underestimates Americans	0.122	0.053
	(0.092)	(0.078)
Co-partisan treatment × underestimates co-partisans	−0.061	−0.037
	(0.124)	(0.097)
Out-partisan treatment × underestimates out-partisans	0.022	−0.011
	(0.118)	(0.097)
American treatment × overestimates Americans	−0.076	0.043
	(0.123)	(0.121)
Co-partisan treatment × overestimates co-partisans	−0.013	−0.056
	(0.107)	(0.097)
Out-partisan treatment × overestimates out-partisans	−0.050	−0.021
	(0.149)	(0.116)
Male		−0.135***
		(0.033)
Republican		−0.337***
		(0.034)
Conservatism		−0.045***
		(0.012)
Health trust		0.489***
		(0.045)
Constant	4.467***	3.609***
	(0.066)	(0.137)
N	2,358	2,353
R^2	0.074	0.352

OLS regression with robust standard errors in parentheses; ***p<0.005, **p<0.01; *p<0.05.

Table A4: Effect of American norms treatment by prior norm estimates (control/American norms conditions only)

	(1)	(2)
American norms treatment	0.072	0.100
	(0.070)	(0.065)
Underestimates American norm	-0.280^{***}	-0.256^{***}
	(0.078)	(0.067)
Overestimates American norm	0.151	0.156
	(0.125)	(0.129)
American treatment $\times$ underestimates Americans	0.108	0.072
	(0.109)	(0.089)
American treatment $\times$ overestimates Americans	0.086	0.120
	(0.150)	(0.141)
Male		-0.158^{***}
		(0.045)
Partisanship		-0.161^{***}
		(0.036)
Conservatism		-0.057^{***}
		(0.016)
Health trust		0.531^{***}
		(0.053)
Constant	4.456^{***}	3.647^{***}
	(0.049)	(0.159)
N	1,416	1,408
R^2	0.024	0.278

OLS regression with robust standard errors in parentheses; $^{***}p<0.005$, $^{**}p<0.01$; $^{*}p<0.05$. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

RQ2: Do norm treatments impact perceived mask effectiveness?

Table A5: Treatment effects on perceived mask effectiveness among partisans

	(1)	(2)
American norms treatment	0.056	0.085*
	(0.047)	(0.038)
Co-partisan norms treatment	−0.009	0.050
	(0.049)	(0.039)
Out-partisan norms treatment	0.023	0.039
	(0.048)	(0.039)
Republican		−0.175***
		(0.025)
Conservatism		−0.044***
		(0.011)
Health trust		0.490***
		(0.038)
Media trust		0.067*
		(0.027)
Constant	3.456***	2.483***
	(0.034)	(0.098)
N	2,519	2,512
R^2	0.001	0.348

OLS regression with robust standard errors in parentheses; ***p<0.005, **p<0.01; *p<0.05.

Table A6: Effect of American norms treatment on perceived mask effectiveness (control/American norms conditions only)

	(1)	(2)
American norms treatment	0.055	0.074*
	(0.045)	(0.036)
Partisanship		−0.106***
		(0.032)
Conservatism		−0.064***
		(0.013)
Health trust		0.513***
		(0.046)
Media trust		0.109***
		(0.035)
Constant	3.411***	2.373***
	(0.033)	(0.117)
N	1,488	1,469
R^2	0.001	0.348

OLS regression with robust standard errors in parentheses; ***p<0.005, **p<0.01; *p<0.05. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

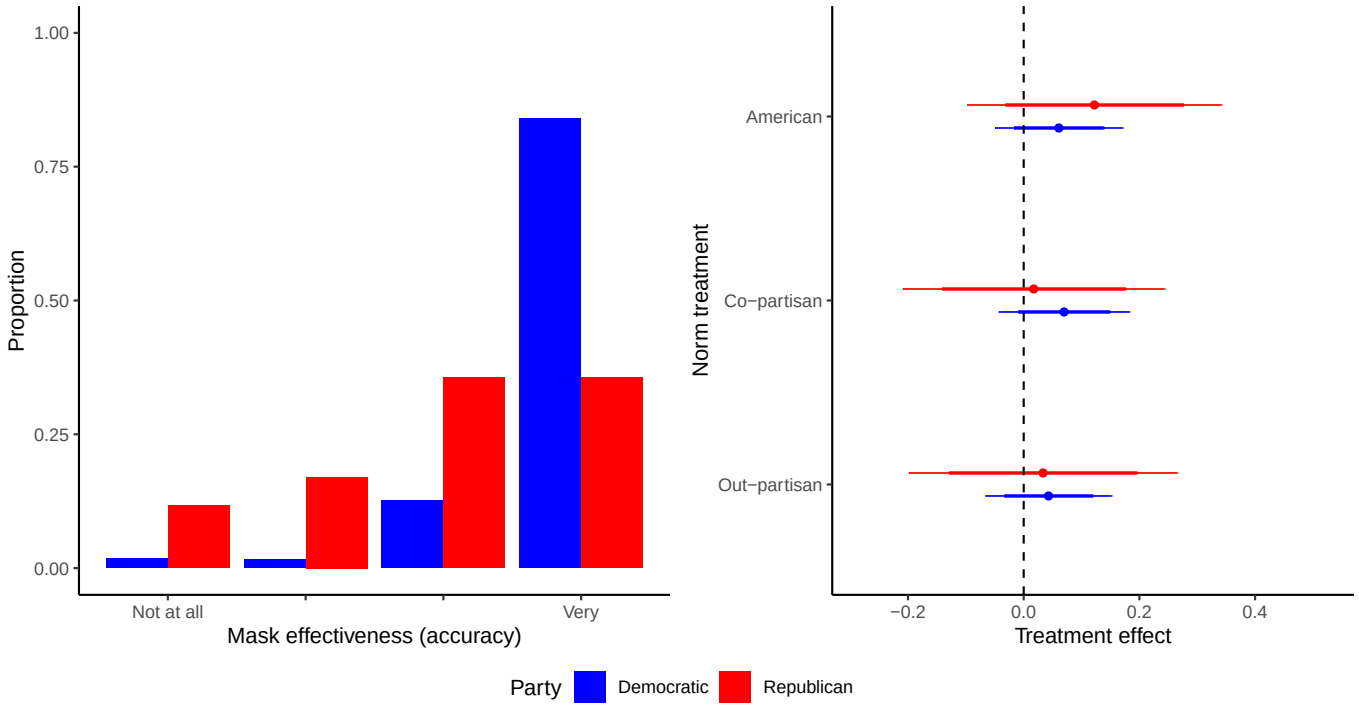
RQ3: Do norm treatment effects differ by party?

Table A7: Treatment effects on mask-wearing intentions and perceived mask effectiveness by party among partisans

	Mask-wearing intentions		Mask effectiveness	
	(1)	(2)	(3)	(4)
American norms treatment	0.055	0.080	0.030	0.061
	(0.045)	(0.045)	(0.041)	(0.039)
Co-partisan treatment	0.007	0.036	0.043	0.070
	(0.045)	(0.046)	(0.040)	(0.040)
Out-partisan treatment	0.043	0.045	0.039	0.043
	(0.043)	(0.043)	(0.039)	(0.039)
Republican	-0.911^{***}	-0.398^{***}	-0.844^{***}	-0.350^{***}
	(0.086)	(0.087)	(0.072)	(0.073)
American treatment × Republican	0.224	0.159	0.130	0.062
	(0.118)	(0.110)	(0.098)	(0.088)
Co-partisan treatment × Republican	−0.072	−0.024	−0.086	−0.052
	(0.123)	(0.114)	(0.100)	(0.090)
Out-partisan treatment × Republican	0.024	0.037	−0.019	−0.009
	(0.123)	(0.113)	(0.103)	(0.091)
Male		-0.161^{***}		
		(0.034)		
Conservatism		-0.048^{***}		-0.044^{***}
		(0.012)		(0.011)
Health trust		0.566^{***}		0.488^{***}
		(0.045)		(0.038)
Media trust				0.066^{*}
				(0.027)
Constant	4.695^{***}	3.460^{***}	3.760^{***}	2.491^{***}
	(0.031)	(0.130)	(0.029)	(0.099)
N	2,519	2,513	2,519	2,512
R^2	0.183	0.288	0.229	0.348

OLS regression with robust standard errors in parentheses; $^{***}p<0.005$, $^{**}p<0.01$; $^{*}p<0.05$.

Figure A1: Perceived mask effectiveness and norm treatment effects by party



Left panel presents perceived mask effectiveness by party. Right panel presents covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on perceived mask effectiveness by party. See Table A7 for corresponding OLS results.

RQ4: Do descriptive norm treatments impact partisan affect?

In the United States, affective polarization (animosity between members of opposing parties) is high (Druckman et al. 2020; Iyengar, Sood and Lelkes 2012; Mason 2015) and mask-wearing is a partisan issue. Does exposure to descriptive norms messages affect the gap between feelings about one's own party versus the other party (Iyengar et al. 2019)? Perceptions of unnecessary compliance or excessive non-compliance with mask mandates among a specific group may be seen as negative among those with different preferences. If such information makes people feel worse about co-partisans (out-partisans), affective polarization should decrease (increase).

Table A8: Treatment effects on affective polarization

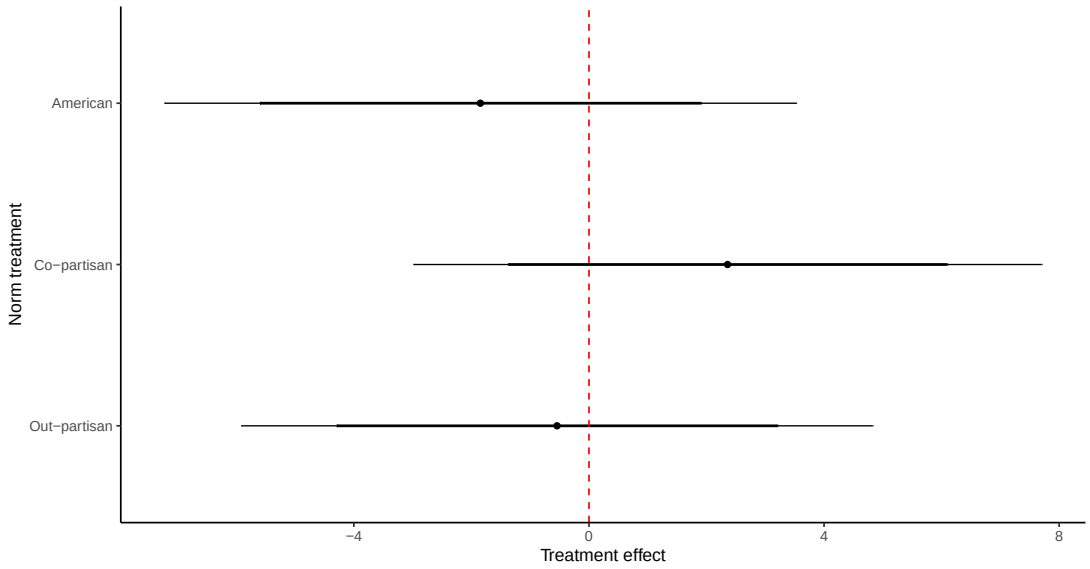
	(1)	(2)	(3)	(4)
American norms treatment	−2.043	−1.102	−1.848	−1.363
	(1.997)	(2.365)	(1.912)	(2.189)
Co-partisan norms treatment	1.588	−0.482	2.358	−0.174
	(1.963)	(2.316)	(1.902)	(2.166)
Out-partisan norms treatment	−0.045	−0.370	−0.543	−1.381
	(1.977)	(2.240)	(1.911)	(2.073)
Republican		−6.599*		−1.200
		(3.042)		(3.909)
American treatment × Republican		−1.932		−1.087
		(4.278)		(4.205)
Co-partisan treatment × Republican		5.803		6.769
		(4.238)		(4.191)
Out-partisan treatment × Republican		1.078		2.321
		(4.358)		(4.332)
Conservatism			−1.715***	−1.840***
			(0.310)	(0.615)
Political interest			8.336***	8.348***
			(0.686)	(0.686)
Constant	56.619***	58.993***	30.652***	31.502***
	(1.378)	(1.567)	(3.274)	(3.517)
N	2,519	2,519	2,518	2,518
R^2	0.001	0.008	0.073	0.075

OLS regression with robust standard errors in parentheses; ***p<0.005, **p<0.01; *p<0.05.

The results, which are depicted in Figure A2, indicate that none of the norms treatments measurably change affective polarization ($p > .05$ in all cases). Among all respondents, we observe the following equivalence bounds when estimating effects on mask-wearing intentions using two one-sided tests — providing information on how many Americans who wear masks: [-5.330, 1.244]; on how many co-partisans wear masks: [-1.643, 4.819]; and on how many out-partisans wear masks: [-3.300, 3.209]. When we subset to Democrats only, the analogous bounds on the effects of providing information on how many Americans wear masks are [-4.996, 2.793]; on how many co-partisans:

[-4.297, 3.332]; and on how many out-partisans: [-4.059, 3.319]. When we subset to Republicans only, the analogous bounds for information on all Americans are [-8.909, 2.840]; on co-partisans: [-0.529, 11.171]; and on out-partisans: [-5.453, 6.849].

Figure A2: Effect of norm treatments on affective polarization



Covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on affective polarization. See Table A8 for corresponding OLS results.

RQ5: Do fact-checking treatments moderate the effect of the norm treatments?

This experiment takes place in the context of a larger multi-wave panel survey with another prior experiment embedded in it. In both Wave 2 and Wave 3 in this survey, respondents were randomly assigned to receive either four articles adapted from U.S. and U.K. fact-checkers debunking four myths about COVID-19 or four placebo articles unrelated to the pandemic (probability .5 each). The fact-checks/placebo articles were presented in randomized order. The Wave 3 random assignment process was unrelated to Wave 2's. Therefore, respondents could receive fact checks in Wave 2 only, Wave 2 only, both Wave 2 and Wave 3, or neither wave.

The fact-check articles addressed two conspiracy theories and two false health claims. The conspiracy theories addressed were claims that Bill Gates patented the novel coronavirus and that the novel coronavirus was developed by China as a bioweapon. One false health claim, that hydroxychloroquine cures COVID-19, has its origins with Donald Trump's continued advocacy for taking the medicine as a preventive measure even though no evidence substantiates this claim. Another false health claim, that antibiotics can cure COVID-19, represents a claim that taps into medical knowledge. The placebo articles were about sauces in cooking, the health benefits of hiking, airlines serving hearing-impaired passengers, and technical advances in mattresses.

We preregistered a research question (RQ5) asking if assignment to fact-checks in Wave 2 or Wave 3 changes the effect of any of the norms treatments on mask-wearing intentions or perceived effectiveness of masks. Table A9 reports the results of preregistered models interacting each norms treatment with each fact-check treatment along with the appropriate constituent terms. Estimated treatment effects by prior fact-check exposure and norm condition are depicted in Figure A3.

A joint null hypothesis test of all constituent and interactive terms containing the fact-check treatments failed to reject the null hypothesis of no treatment effect heterogeneity by fact-check exposure for mask-wearing intentions ($p > .05$). We therefore conclude that fact-check exposure does not moderate the effects of the norms treatments on mask-wearing intentions. (The only exception is the significant interaction between the co-partisan treatment and Wave 2 fact-check exposure.)

However, we reject the null of no treatment effect heterogeneity by fact-check exposure for the efficacy of masks in our fully specified model and thus investigate those estimated effects further. The American descriptive norms treatment did not affect the perceived efficacy of masks among people who were not exposed to fact-checks ($p > .05$). We also observe no evidence of heterogeneous treatment effects by fact-check exposure ($p > .05$ for each interaction term).[1]

However, though the co-partisan norms treatment effect is null among people not exposed to fact-checks ($p > .05$), the interaction term is significant for people exposed to the Wave 2 fact-check

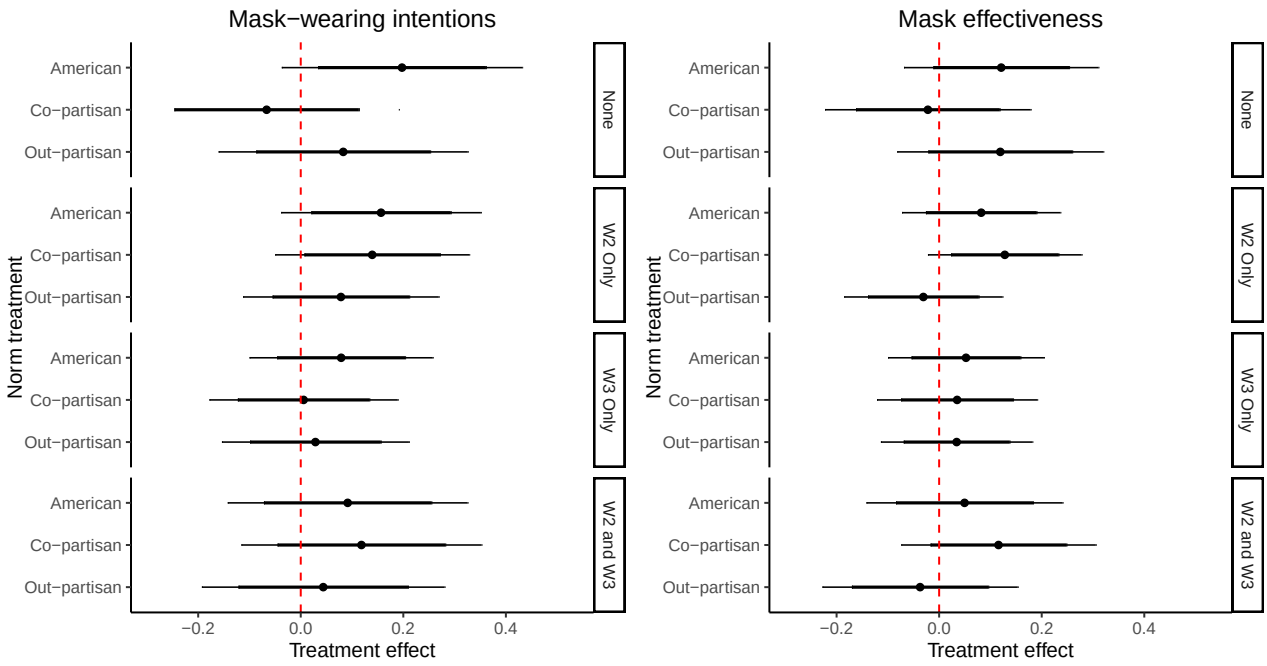
[1]The estimated value of the American treatment $\times$ Wave 2 fact-check exposure in Table A9 was $\hat{\beta} = -0.006$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.210|$. The estimated value of the American treatment $\times$ Wave 3 fact-check exposure in Table A9 was $\hat{\beta} = -0.066$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.230|$.

Table A9: Norm treatment effects by prior exposure to COVID fact-checks

	Mask-wearing intentions		Mask effectiveness	
	(1)	(2)	(3)	(4)
American norms treatment	0.150	0.197*	0.078	0.121
	(0.097)	(0.083)	(0.082)	(0.067)
Co-partisan norms treatment	−0.132	−0.067	−0.082	−0.022
	(0.109)	(0.092)	(0.088)	(0.071)
Out-partisan norms treatment	0.018	0.083	0.055	0.119
	(0.103)	(0.086)	(0.085)	(0.072)
Wave 2 fact-check	−0.123	−0.026	−0.069	−0.028
	(0.079)	(0.067)	(0.068)	(0.055)
Wave 3 fact-check	0.063	0.084	−0.006	0.021
	(0.080)	(0.068)	(0.069)	(0.055)
American treatment × Wave 2 fact-check	−0.009	0.026	−0.043	−0.006
	(0.109)	(0.094)	(0.094)	(0.077)
Co-partisan treatment × Wave 2 fact-check	0.259*	0.227*	0.186*	0.163*
	(0.116)	(0.098)	(0.091)	(0.078)
Out-partisan treatment × Wave 2 fact-check	0.073	0.031	−0.102	−0.144
	(0.113)	(0.097)	(0.090)	(0.078)
American treatment × Wave 3 fact-check	−0.052	−0.131	−0.001	−0.066
	(0.109)	(0.094)	(0.094)	(0.077)
Co-partisan treatment × Wave 3 fact-check	−0.074	−0.042	−0.044	−0.025
	(0.116)	(0.098)	(0.098)	(0.079)
Out-partisan treatment × Wave 3 fact-check	−0.013	−0.070	0.040	−0.013
	(0.113)	(0.095)	(0.097)	(0.078)
Male		−0.164***		
		(0.034)		
Republican		−0.178***		−0.175***
		(0.028)		(0.025)
Conservatism		−0.048***		−0.044***
		(0.012)		(0.011)
Health trust		0.567***		0.485***
		(0.045)		(0.037)
Media trust				0.069**
				(0.027)
Constant	4.393***	3.435***	3.493***	2.494***
	(0.075)	(0.143)	(0.062)	(0.109)
N	2,519	2,513	2,519	2,512
R^2	0.007	0.290	0.006	0.352
Joint F-test	1.296	1.228	1.711	2.097*

OLS regression with robust standard errors in parentheses; ***p<0.005, **p<0.01; *p<0.05. Joint F-test represents a test of whether all coefficients containing the fact-check treatments are 0.

Figure A3: Effects of norm treatments on mask-wearing intentions and perceived mask effectiveness by COVID fact-check exposure



Covariate-adjusted average treatment effects of norm treatments (including 95% and 99.5% confidence intervals) on mask-wearing intentions and perceived mask effectiveness by COVID fact-checking exposure (none, Wave 2 only, Wave 3 only, or both Wave 2 and Wave 3). See Table A9 for corresponding OLS results.

($p < .05$) (but not those exposed to the Wave 3 fact-check [$p > .05$]).[2] We therefore estimate the following equivalence bounds using two one-sided tests: [-0.250, 0.097] with no exposure to fact-checks; [-0.029, 0.191] with exposure to Wave 2 fact-checks; and [-0.145, 0.081] with exposure to Wave 3 fact-checks.

Finally, the out-partisan norms treatment had no measurable effect on the perceived effectiveness of masks ($p > .05$; equivalence bounds using two one-sided tests: [-0.106, 0.222]). We also ob-

[2]The estimated value of the co-partisan treatment $\times$ Wave 3 fact-check exposure in Table A9 was $\hat{\beta} = -0.025$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.230|$.

serve no evidence of treatment effect heterogeneity by fact-check exposure ($p > .05$ in both cases).[3]

[3]The estimated value of the out-partisan treatment $\times$ Wave 2 fact-check exposure in Table A9 was $\hat{\beta} = -0.144$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.230|$. The estimated value of the out-partisan treatment $\times$ Wave 3 fact-check exposure in Table A9 was $\hat{\beta} = -0.013$; simulations conducted using DeclareDesign indicate that we have 80% power to detect an effect of $\beta = |0.240|$.

Ordered logits

Table A10: Treatment effects on mask-wearing intentions among partisans

	(1)	(2)
American norms treatment	0.301***	0.413**
	(0.116)	(0.125)
Co-partisan norms treatment	−0.049	0.080
	(0.112)	(0.121)
Out-partisan norms treatment	0.146	0.214
	(0.113)	(0.123)
Male		−0.496***
		(0.089)
Republican		−0.441***
		(0.067)
Conservatism		−0.115***
		(0.033)
Health trust		1.156***
		(0.085)
N	2,519	2,513

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; ***p<0.005, **p<0.01; *p<0.05.

Table A11: Effect of American norms treatment on mask-wearing intentions (control/American norms conditions only)

	(1)	(2)
American norms treatment	0.288^{**}	0.357^{***}
	(0.105)	(0.114)
Male		-0.488^{***}
		(0.114)
Partisanship		-0.452^{***}
		(0.089)
Conservatism		-0.098^{*}
		(0.043)
Health trust		1.152^{***}
		(0.102)
N	1,488	1,470

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; $^{***}p<0.005$, $^{**}p<0.01$; $^{*}p<0.05$. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

Table A12: Predicted probability of mask-wearing (main effects)

	Not at all	Not very often	Some of the time	Most of the time	All of the time
Partisans					
Control	1.31%	2.57%	5.85%	22.68%	67.58%
American treatment	0.87%	1.73%	4.06%	17.43%	75.90%
Co-partisan treatment	1.21%	2.38%	5.45%	21.64%	69.31%
Out-partisan treatment	1.06%	2.10%	4.85%	19.90%	72.09%
Full sample					
Control	1.25%	2.84%	5.87%	22.58%	67.46%
American treatment	0.92%	2.10%	4.44%	18.55%	73.99%

Predicted probabilities estimated from the results reported in Table A10.

Table A13: Treatment effects on mask-wearing intentions by prior norm estimates among partisans

	(1)	(2)
American norms treatment	0.286	0.172*
	(0.172)	(0.184)
Co-partisan norms treatment	−0.065	0.126
	(0.174)	(0.189)
Out-partisan norms treatment	0.234	0.250
	(0.198)	(0.209)
Underestimates American norm	−0.559***	−0.228
	(0.113)	(0.123)
Underestimated co-partisan norm	−0.757***	−0.739***
	(0.126)	(0.136)
Underestimates out-partisan norm	0.677***	0.494***
	(0.207)	(0.224)
Overestimates American norm	0.694***	0.521*
	(0.068)	(0.069)
Overestimates co-partisan norm	−0.962***	0.822***
	(0.126)	(0.161)
Overestimates out-partisan norm	0.354*	0.075
	(0.149)	(0.163)
American treatment × underestimates Americans	0.236	0.151
	(0.217)	(0.232)
Co-partisan treatment × underestimates co-partisans	−0.003	0.042
	(0.243)	(0.260)
Out-partisan treatment × underestimates out-partisans	−0.131	−0.120
	(0.232)	(0.247)
American treatment × overestimates Americans	−0.276	−0.089
	(0.440)	(0.462)
Co-partisan treatment × overestimates co-partisans	0.053	−0.083
	(0.242)	(0.262)
Out-partisan treatment × overestimates out-partisans	−0.074	−0.023
	(0.309)	(0.330)
Male		−0.497***
		(0.094)
Republican		−0.842***
		(0.085)
Conservatism		−0.114***
		(0.037)
Health trust		1.033***
		(0.093)
N	2,358	2,353

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; ***p<0.005, **p<0.01; *p<0.05. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

Table A14: Effect of American norms treatment by prior norm estimates (control/American norms conditions only)

	(1)	(2)
American norms treatment	0.179	0.223
	(0.168)	(0.184)
Underestimates American norm	-0.506^{***}	-0.679^{***}
	(0.154)	(0.166)
Overestimates American norm	0.414	0.443
	(0.318)	(0.351)
American treatment $\times$ underestimates Americans	0.214	0.259
	(0.226)	(0.243)
American treatment $\times$ overestimates Americans	0.140	0.220
	(0.468)	(0.507)
Male		-0.533^{***}
		(0.118)
Partisanship		-0.460^{***}
		(0.093)
Conservatism		-0.126^{***}
		(0.044)
Health trust		1.090^{***}
		(0.108)
N	1,416	1,408

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; $^{***}p<0.005$, $^{**}p<0.01$; $^{*}p<0.05$. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

Table A15: Predicted probabilities of mask-wearing by prior norm estimation)

	Not at all	Not very often	Some of the time	Most of the time	All of the time
Partisans					
Control: Accurate	1.01%	2.49%	6.42%	26.62%	63.26%
Control: Underestimated American norm	1.27%	3.34%	7.79%	29.78%	57.82%
Control: Overestimated American norm	0.61%	1.63%	4.04%	19.37%	74.36%
Control: Underestimated co-partisan norm	2.10%	5.36%	11.63%	35.79%	45.12%
Control: Overestimated co-partisan norm	0.45%	1.22%	3.06%	15.62%	79.66%
Control: Underestimated out-partisan norm	0.62%	1.67%	4.14%	19.73%	73.84%
Control: Overestimated out-partisan norm	0.94%	2.51%	6.02%	25.54%	64.99%
American treatment: Accurate	0.69%	1.86%	4.58%	21.24%	71.62%
American treatment: Underestimated	0.75%	2.01%	4.91%	22.29%	70.05%
American treatment: Overestimated	0.45%	1.22%	3.08%	15.70%	79.55%
Co-partisan treatment: Accurate	0.90%	2.39%	5.75%	24.82%	66.14%
Co-partisan treatment: Underestimated	0.86%	2.29%	5.55%	24.24%	67.05%
Co-partisan treatment: Overestimated	0.90%	2.39%	5.75%	24.82%	66.14%
Out-partisan treatment, Accurate	0.79%	2.12%	5.16%	23.07%	68.86%
Out-partisan treatment: Underestimated	0.55%	1.47%	3.67%	18.03%	76.27%
Out-partisan treatment: Overestimated	0.75%	2.01%	4.92%	22.34%	69.97%
Full sample					
Control: Accurate on American norm	0.83%	2.27%	4.55%	20.53%	71.82%
Control: Underestimated American norm	1.64%	4.30%	8.10%	29.57%	56.39%
Control: Overestimated American norm	0.54%	1.47%	3.04%	15.07%	79.87%
American treatment: Accurate	0.67%	1.83%	3.72%	17.67%	76.12%
American treatment: Underestimated	1.02%	2.73%	5.41%	23.15%	67.69%
American treatment: Overestimated	0.35%	0.96%	2.00%	10.62%	86.08%

Predicted probabilities estimated from the results reported in Tables A13 and A14.

Table A16: Treatment effects on perceived mask effectiveness among partisans

	(1)	(2)
American norms treatment	0.099	0.226
	(0.116)	(0.131)
Co-partisan norms treatment	−0.028	0.146
	(0.115)	(0.131)
Out-partisan norms treatment	0.069	0.124
	(0.115)	(0.131)
Republican		−0.495***
		(0.071)
Conservatism		−0.185***
		(0.036)
Health trust		1.332***
		(0.099)
Media trust		0.276*
		(0.078)
N	2,519	2,512

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; ***p<0.005, **p<0.01; *p<0.05.

Table A17: Effect of American norms treatment on perceived mask effectiveness (control/American norms conditions only)

	(1)	(2)
American norms treatment	0.074	0.169
	(0.105)	(0.120)
Partisanship		−0.341***
		(0.093)
Conservatism		−0.245***
		(0.045)
Health trust		1.363***
		(0.122)
Media trust		0.372***
		(0.100)
N	1,488	1,469

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; ***p<0.005, **p<0.01; *p<0.05. Partisanship is measured as a three-point scale where 1=Democrat and 3=Republican (including leaners).

Table A18: Predicted probabilities of perceived mask effectiveness (main effects)

	Not at all accurate	Not very accurate	Somewhat accurate	Very accurate
Partisans				
Control	2.25%	4.73%	24.85%	68.17%
American treatment	1.81%	3.84%	21.49%	72.86%
Co-partisan treatment	1.95%	4.14%	22.65%	71.26%
Out-partisan treatment	2.00%	4.22%	22.98%	70.80%
Full sample				
Control	2.53%	5.00%	28.67%	63.79%
American treatment	2.15%	4.29%	25.96%	67.60%

Predicted probabilities estimated from the results reported in Tables A16 and A17.

Table A19: Treatment effects on mask-wearing intentions and perceived mask effectiveness by party among partisans

	Mask-wearing intentions		Mask effectiveness	
	(1)	(2)	(3)	(4)
American norms treatment	0.301	0.361*	0.097	0.232
	(0.175)	(0.181)	(0.190)	(0.202)
Co-partisan treatment	0.058	0.113	0.202	0.333
	(0.167)	(0.174)	(0.193)	(0.206)
Out-partisan treatment	0.184	0.182	0.128	0.142
	(0.168)	(0.175)	(0.188)	(0.199)
Republican	−1.833***	−0.903***	−2.228***	−0.897***
	(0.166)	(0.197)	(0.177)	(0.212)
American treatment × Republican	0.191	0.096	0.181	−0.014
	(0.244)	(0.251)	(0.253)	(0.265)
Co-partisan treatment × Republican	−0.152	−0.061	−0.305	−0.313
	(0.237)	(0.243)	(0.255)	(0.267)
Out-partisan treatment × Republican	−0.017	0.064	−0.060	−0.033
	(0.239)	(0.245)	(0.253)	(0.264)
Male		−0.494***		
		(0.089)		
Conservatism		−0.116***		−0.187***
		(0.033)		(0.036)
Health trust		1.153***		1.328***
		(0.085)		(0.099)
Media trust				0.277*
				(0.078)
N	2,519	2,513	2,519	2,512

Ordered logistic regression with standard errors in parentheses and cutpoints omitted; ***p<0.005, **p<0.01; *p<0.05.

Table A20: Predicted probabilities of mask-wearing intention by party

	Not at all	Not very often	Some of the time	Most of the time	All of the time
Control: Democrats	0.94%	1.86%	4.33%	18.33%	74.55%
Control: Republicans	2.28%	4.34%	9.29%	29.81%	54.29%
American treatment: Democrats	0.65%	1.31%	3.11%	14.15%	80.78%
American treatment: Republicans	1.45%	2.84%	6.40%	24.08%	65.03%
Co-partisan treatment: Democrats	0.84%	1.67%	3.91%	16.96%	76.63%
Co-partisan treatment: Republicans	2.17%	4.14%	8.92%	29.21%	55.56%
Out-partisan treatment: Democrats	0.78%	1.56%	3.67%	16.15%	77.84%
Out-partisan treatment: Republicans	1.79%	3.46%	7.64%	26.83%	60.28%

Predicted probabilities estimated from the results reported in Table A19.

Table A21: Predicted probabilities of perceived mask effectiveness by party

	Not at all accurate	Not very accurate	Somewhat accurate	Very accurate
Control: Democrats	1.64%	3.52%	20.17%	74.67%
Control: Republicans	3.94%	7.84%	33.65%	54.58%
American treatment: Democrats	1.31%	2.83%	17.06%	78.80%
American treatment: Republicans	3.19%	6.50%	30.41%	50.90%
Co-partisan treatment: Democrats	1.18%	2.57%	15.81%	80.44%
Co-partisan treatment: Republicans	3.86%	7.71%	33.36%	55.07%
Out-partisan treatment: Democrats	1.43%	3.08%	18.23%	77.26%
Out-partisan treatment: Republicans	3.55%	7.14%	32.05%	57.26%

Predicted probabilities estimated from the results reported in Table A19.

Table A22: Norm treatment effects by prior exposure to COVID fact-checks

	Mask-wearing intentions		Mask effectiveness	
	(1)	(2)	(3)	(4)
American norms treatment	0.415*	0.588*	0.132	0.253
	(0.210)	(0.228)	(0.210)	(0.239)
Co-partisan norms treatment	−0.204	−0.099	−0.179	−0.140
	(0.202)	(0.219)	(0.208)	(0.236)
Out-partisan norms treatment	0.090	0.298	0.208	0.468
	(0.202)	(0.221)	(0.210)	(0.242)
Wave 2 fact-check	−0.283	−0.234	−0.233	−0.192
	(0.156)	(0.170)	(0.161)	(0.183)
Wave 3 fact-check	0.136	0.242	0.021	0.058
	(0.157)	(0.170)	(0.161)	(0.184)
American treatment × Wave 2 fact-check	−0.021	0.065	−0.047	0.063
	(0.233)	(0.251)	(0.233)	(0.264)
Co-partisan treatment × Wave 2 fact-check	0.518*	0.555*	0.458*	0.634*
	(0.224)	(0.243)	(0.231)	(0.262)
Out-partisan treatment × Wave 2 fact-check	0.156	0.045	−0.235	−0.510
	(0.227)	(0.246)	(0.232)	(0.264)
American treatment × Wave 3 fact-check	−0.194	−0.393	−0.014	−0.109
	(0.233)	(0.252)	(0.233)	(0.265)
Co-partisan treatment × Wave 3 fact-check	−0.209	−0.197	−0.166	−0.074
	(0.224)	(0.243)	(0.231)	(0.262)
Out-partisan treatment × Wave 3 fact-check	−0.028	−0.190	−0.016	−0.128
	(0.227)	(0.246)	(0.232)	(0.264)
Male		−0.496***		
		(0.089)		
Republican		−0.445***		−0.499***
		(0.068)		(0.072)
Conservatism		−0.118***		−0.189***
		(0.033)		(0.036)
Health trust		1.146***		1.329***
		(0.085)		(0.099)
Media trust				0.284**
				(0.078)
N	2,519	2,513	2,519	2,512

Ordered logistic regression with robust standard errors in parentheses and cutpoints omitted; ***p<0.005, **p<0.01; *p<0.05.

Table A23: Predicted probabilities of mask-wearing by fact-check condition

	Not at all	Not very often	Some of the time	Most of the time	All of the time
Control: No fact-check	1.31%	2.58%	5.90%	22.90%	67.30%
Control: W2 fact-check	1.65%	3.22%	7.20%	25.97%	61.96%
Control: W3 fact-check	1.03%	2.05%	4.77%	19.75%	72.39%
American treatment: No fact-check	0.73%	1.47%	3.49%	15.56%	78.74%
American treatment: W2 fact-check	0.86%	1.73%	4.07%	17.55%	75.77%
American treatment: W3 fact-check	0.85%	1.70%	4.01%	17.34%	76.10%
Co-partisan treatment: No fact-check	1.45%	2.84%	6.42%	24.20%	65.10%
Co-partisan treatment: W2 fact-check	1.05%	2.09%	4.86%	20.00%	72.00%
Co-partisan treatment: W3 fact-check	1.38%	2.72%	6.18%	23.60%	66.11%
Out-partisan treatment: No fact-check	0.98%	1.94%	4.54%	19.04%	73.50%
Out-partisan treatment: W2 fact-check	1.18%	2.33%	5.37%	21.47%	69.65%
Out-partisan treatment: W3 fact-check	0.93%	1.85%	4.33%	18.39%	74.50%

Predicted probabilities estimated from the results reported in Table A22.

Table A24: Predicted probabilities of perceived mask effectiveness by fact-check condition

	Not at all accurate	Not very accurate	Somewhat accurate	Very accurate
Control: No fact-check	2.07%	4.41%	23.95%	69.57%
Control: W2 fact-check	2.50%	5.25%	26.90%	65.36%
Control: W3 fact-check	1.95%	4.18%	23.08%	70.79%
American treatment: No fact-check	1.61%	3.49%	20.25%	74.65%
American treatment: W2 fact-check	1.83%	3.93%	22.10%	72.14%
American treatment: W3 fact-check	1.70%	3.66%	20.97%	73.67%
Co-partisan treatment: No fact-check	2.37%	5.00%	26.08%	65.55%
Co-partisan treatment: W2 fact-check	1.54%	3.33%	19.55%	75.58%
Co-partisan treatment: W3 fact-check	2.41%	5.08%	26.33%	66.18%
Out-partisan treatment: No fact-check	1.30%	2.85%	17.34%	78.51%
Out-partisan treatment: W2 fact-check	2.60%	5.44%	27.54%	64.42%
Out-partisan treatment: W3 fact-check	1.40%	3.04%	18.25%	77.30%

Predicted probabilities estimated from the results reported in Table A22.

Balance tables and missingness

Table A25: Balance tests for experimental randomization

	Control	American	Democrat	Republican	p-value
University	43.7%	41.7%	40.7%	43.3%	.609
Age 18–34	109.0%	12.5%	14.2%	13.2%	.082
Age 35–44	14.6%	10.6%	13.8%	14.1%	.089
Age 45–54	12.9%	15.4%	16.8%	16.3%	.160
Age 55–64	28.9%	27.7%	24.9%	22.8%	**.032**
Age 65+	33.6%	33.9%	30.2%	33.6%	.387
Male	46.1%	44.0%	46.1%	47.9%	.534
Married	49.4%	52.3%	50.7%	50.7%	.748
Frequent church attendance	26.2%	27.8%	30.4%	26.9%	.308
Northeast	28.8%	30.6%	31.0%	32.4%	.496
South	28.9%	30.2%	31.6%	28.1%	.471
Midwest	23.4%	17.8%	19.9%	20.7%	.068
West	19.0%	21.4%	17.5%	18.8%	.288
Democratic	55.9%	52.1%	52.0%	53.9%	.386
Independent	12.6%	14.7%	15.9%	14.2%	.359
Republican	31.4%	33.1%	32.1%	31.8%	.910
Conservatism	3.8	4.0	4.0	3.8	.064
High-incidence area	25.2%	25.7%	27.2%	27.6%	.667
Cognitive Reflection Test	1.0	1.0	0.9	0.9	.630
Political knowledge	4.0	3.9	3.8	4.0	**.042**
Non-white	23.2%	26.5%	30.1%	25.6%	**.023**
Political interest	3.8	3.8	3.8	3.8	.539
Health trust	2.3	2.3	2.2	2.2	.401
Media trust	1.9	1.9	1.9	1.9	.939

Unweighted. p-values are calculated using χ^2 statistics for binary variables and F-tests for non-binary variables. Significant differences in bold ($p < .05$).

Table A26: Missingness in non-outcome variables

Variable	Control	American	Co-partisan	Out-partisan
Gender	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Party ID	8 (0.8%)	8 (1.1%)	0 (0%)	0 (0%)
Ideology	2 (0.2%)	0 (0%)	0 (0%)	0 (0%)
Health trust	3 (0.3%)	0 (0%)	3 (0.5%)	1 (0.16%)
Media trust	2 (0.2%)	0 (0%)	1 (0.16%)	0 (0%)
Estimated American norm	60 (6.1%)	38 (5.2%)	29 (4.7%)	28 (4.4%)
Estimated co-partisan norm	349 (35.6%)	148 (20.3%)	32 (5.2%)	30 (4.7%)
Estimated out-partisan norm	353 (36.0%)	147 (20.2%)	38 (6.2%)	36 (5.7%)

Missingness is higher in estimates of co-partisan and out-partisan norms in the control and American norms treatment conditions because those measures are not defined for independents.

In the partisans-only models, 6 observations were removed via listwise deletion from the mask-wearing analyses and 7 were removed from the mask effectiveness analyses due to missingness on one or more covariates. In the analyses containing norm estimates, an additional 161 observations experienced listwise deletion due to missingness on one or more norm estimates.

In the "full" models containing only respondents in the control and American norms conditions only, 19 observations were removed by listwise deletion in the mask-wearing analyses and 20 in the mask effectiveness analyses because of missingness on one or more covariates. In the analyses containing norm estimates, an additional 98 observations were removed by listwise deletion due to missingness on national norms estimates.

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