

Research Article

# How to encourage “Togetherness by Keeping Apart” amid COVID-19? The ineffectiveness of prosocial and empathy appeals

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**Abstract:** The COVID-19 pandemic is a major challenge facing societies around the world. Citizen engagement in “social distancing” is a key containment measure for curtailing the spread of the virus. But what kind of information should governments use for encouraging social distancing compliance? Using data from a pre-registered survey experiment among US residents ( $n = 1,502$ ), we examine how five distinct COVID-19 information cues—which each appeal to prosocial motivation and empathy in varying degree—affect people’s willingness to social distance. We find no significant differences across experimental conditions in terms of (a) the duration that respondents are willing to maintain social distancing, (b) intended social distancing behavior, or (c) COVID-19-related attitudes and beliefs. Our findings should not necessarily discourage decision-makers from priming prosocial motivation and empathy as means for promoting social distancing, but they do suggest a current need for more engaging medium than simple textual messages for such appeals.

**Keywords:** Coronavirus, COVID-19, Social distancing, Survey experiment

**Supplements:** [Open data](#), [Open materials](#), [Preregistered](#)

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The COVID-19 pandemic calls for collective action. The virus originated and first spread in the Hubei province of China in late 2019. After a period of rapid spread, Chinese authorities enacted a strict lockdown policy prohibiting people from leaving their home, without setting a defined end date (Hessler, 2020; Yang & Kubota, 2020). Similarly, in efforts to slow down the spread of the virus, governments across the globe are instructing citizens to maintain a physical distance from others and avoid crowds (i.e., “social distancing,” also referred to as “physical distancing”) (Beall, 2020; Briscese, Lacetera, Macis, & Tonin, 2020; Merelli, 2020; Politico, 2020). Complementing other containment measures, such as hand hygiene and widespread testing, public health authorities and experts agree that minimizing physical contact among people is a key measure for mitigating the spread of the coronavirus (Ahmed, Zviedrite, & Uzicanin, 2018; Chen, Yang, Yang, Wang, & Bärnighausen, 2020; ECDC, 2020; Markel, Lipman, Navarro, Sloan, Michalsen, Stern, & Cetron, 2007; Rashid, Ridda, King, Begun, Tekin, Wood, & Booy, 2015; WHO, 2020; Zhang, Jiang, Yuan, & Tao, 2020). But how can governments encourage citizens to engage in social distancing? What kind of public information is effective for eliciting social distancing compliance?

This article shows how different COVID-19 information cues affect intended social distancing compliance. Using a survey experiment, we expose a sample of 1,502 US residents to one of five information cues; these cues offer information that appeals to prosocial motivation and empathy in different ways and to varying extents. We estimate effects in relation to two primary outcomes: (1) duration (number of weeks) that respondents are

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willing to stay at home and avoid social contact, and (2) an index of intended social distancing behavior. We also examine effects on an index of COVID-19-related attitudes and beliefs, and we test for heterogeneous effects (by demographic characteristics, political affiliation, news consumption, prosocial motivation, and empathy).

Social distancing is not only self-beneficial but also involves collective beneficence. In the context of the COVID-19 pandemic, social distancing represents a prosocial behavior benefitting the health and lives of others, especially those most vulnerable to the virus. Social distancing compliance thus relates to both prosocial motivation and empathy.

Prosocial motivation is defined as “the desire to protect or improve the well-being of other people” (Grant & Berg, 2012, p. 28). Unlike self-interested motivation, prosocial motivation is thus born out of a consideration for others and fuels prosocial behaviors such as donating, cooperating, and helping. Research shows that prosocial motivation drives decisions that are beneficial to the collective and for attaining collective goals (De Dreu, Nijstad, & Knippenberg, 2008). Across various settings, exposure to information serving the perception that a particular behavior or task exerts a positive prosocial impact on others and society is found to arouse that behavior or improve task compliance (Grant, Campbell, Chen, Cottone, Lapedis, & Lee, 2007; Grant & Hofmann, 2011; Belle, 2013; Kropf & Blair, 2005; Pedersen, 2015). In the context of epidemic containment, research shows that promoting prosocial motivation may shift influenza vaccination decisions away from individual self-interest and towards the community optimum, reducing costs, morbidity, and mortality (Shim, Chapman, Townsend, & Galvani, 2012). Similarly, exploratory analyses show that an “impartial concern for the greater good” is strongly and positively associated with COVID-19-related public health intentions and beliefs (Everett, Colombatto, Chituc, Brady, & Crockett, 2020).

Empathy is often defined as “understanding another person’s experience by imagining oneself in that other person’s situation” (Hodges & Myers, 2007). Empathy makes one understand another person’s experience as if it were being experienced by the self, but without the self actually experiencing it. Research demonstrates how empathy produces altruistic motivation, thus evoking orientations toward increasing the welfare of others, especially those in need (Batson, Ahmad, & Lishner, 2009). Indeed, both empathy and exposure to empathy-inducing cues are found to promote behavior benefitting and protecting the health of vulnerable others (Del Canale, Louis, Maio, Wang, Rossi, Hojat, & Gonnella, 2012; Sassenrath, Diefenbacher, Siegel, & Keller, 2016). Directly related to the COVID-19 pandemic, recent work documents positive associations between empathy and social distancing in the US, UK, and Germany, and that an empathy appeal (i.e., video of an elderly male who no longer visits his chronically sick wife because of the outbreak) promotes social distancing adherence among German citizens (Pfattheicher, Nockur, Böhm, Sassenrath, & Petersen, 2020; see also Lunn, Timmons, Barjaková, Belton, Julianne, & Lavin, 2020; Utych & Fowler, 2020; Zettler, Schild, Lilleholt, & Böhm, 2020).

Thus, both prosocial motivation and empathy fuel a range of prosocial behaviors benefitting the health and well-being of others. Based on these insights, we theorize that COVID-19 information cues involving appeals to prosocial motivation and empathy regarding the health of others may have positive effects on both social distancing willingness and behavior. While this notion builds on past research, greater knowledge is needed about the utility of such information cues. To what extent can they be actively used for promoting social distancing—a key measure for curbing the spread of the coronavirus? Which kind of language is most effective for priming social distancing compliance through appeals to prosocial motivation and empathy? That is, are particular COVID-19 information cues that evoke prosocial motivation and empathy more effective than others for eliciting social distancing? We contribute to this important agenda using survey data involving random assignment to COVID-19 information cues that aims to induce prosocial motivation and empathy in different ways and to varying extents.

## Data and Methods

Our sample comprises US residents. Paid participants were recruited via Prolific—a commercial crowdworking platform similar to Amazon’s Mechanical Turk.<sup>1</sup> Prolific has a diverse participant pool with more than 70,000 vetted panelists and is suitable for online social science experimentation (Palan & Schitter, 2018). The survey included three attention check items, each one embedded in a separate item battery, and results indicate that

respondents exhibited a high level of attentiveness.<sup>2</sup> An institutional review board approved our study design, which was also preregistered at the AEA RCT Registry (AEARCTR-0005611); replication files are available at Harvard Dataverse.<sup>3</sup>

The survey was fielded, and all data collected, on April 3, 2020. By this time, the U.S. had led the world in the total (cumulative) number of confirmed cases for just over a week (McNeil, 2020). There was widespread agreement among public officials at various levels of government on the need for social distancing, although the public had heard somewhat mixed messages over the past several weeks. For example, several state governors (e.g., of Georgia, Florida) who had previously resisted calls for stay-at-home orders came to issue such orders during the week of April 3, bringing the total number of states with some sort of stay-at-home (or similar) order to 42 out of 50 (Fernandez, 2020). At the national level, President Trump had repeatedly expressed concern about the economic effects of social distancing, tweeting, for example, on March 22 that “WE CANNOT LET THE CURE BE WORSE THAN THE PROBLEM ITSELF” (@realDonaldTrump, 2020). President Trump then announced on March 29 that federal social distancing guidelines would remain in effect through April 30, after having repeatedly said during the prior week that he hoped to relax measures by Easter (April 12) (Shear, 2020). Because the pandemic had already advanced to a stage that had caused significant disruption to most American’s lives, our study tests the effect of messaging on social distancing among a public that is already fairly saturated with information about the pandemic and is already engaging to a large degree in social distancing behaviors (Bruce, Nguyen, Ballard, & Sanders, 2020; Fetzer et al., 2020; Wise, Zbozinek, Michelini, Hagan, & Mobbs, 2020). Thus, we would expect any effects of messaging to be potentially dampened compared to a point in the pandemic when people had less familiarity with the dangers associated with the virus.

The survey sample size was based on a priori power analysis. With five survey experimental conditions and balanced group sizes, 1,500 valid responses should power our study to enable detecting of effects of Cohen’s  $f > .10$  with high statistical power (power = .90; alpha = .05, two-tailed). We received usable data from 1,502 respondents with near-equal distribution across experimental conditions (the largest difference in number of respondents is two).<sup>4</sup>

### ***Experimental Design***

Our split ballot survey experiment appeared after three short pages of survey items collecting background information on participants. Respondents were exposed to a five-armed, parallel-design (between-subjects), individually randomized trial.

All respondents were presented with the following information about the COVID-19 situation in the US:

*“The coronavirus (COVID-19) situation is constantly changing, and we are getting new information every day. Public health officials don’t yet know exactly how long it will take to get the situation under control. Think for a moment about how your daily life is being affected by the disease outbreak.*

*We know that COVID-19 is spreading rapidly. It is true that many people survive the illness. But people with COVID-19 can start spreading the virus days before they realize they have it.”*

By random assignment, about one-fifth of the respondents only received this information, thus representing our control group. The other respondents were additionally treated to one of the following four information cues, all presented in bold font and presented immediately after the other text:

*Treatment 1: “Remember, your personal health is at stake. Even young, healthy adults who are exposed to the virus may get seriously ill and require intensive hospital treatment.”*

*Treatment 2: “Remember, you play a critical role in helping to stop the spread of the virus. Any of us could accidentally pass the virus on to a close friend or family member who is not in good health.”*

*Treatment 3: “Remember, you play a critical role in helping to stop the spread of the virus. Unless we all work together, the virus may spread to the people who are most likely to die from it.”*

*Treatment 4: “Remember, you play a critical role in helping to stop the spread of the virus. Unless we all work together, the virus may overwhelm our hospitals and they won’t be able to give everyone the treatment they need.”*

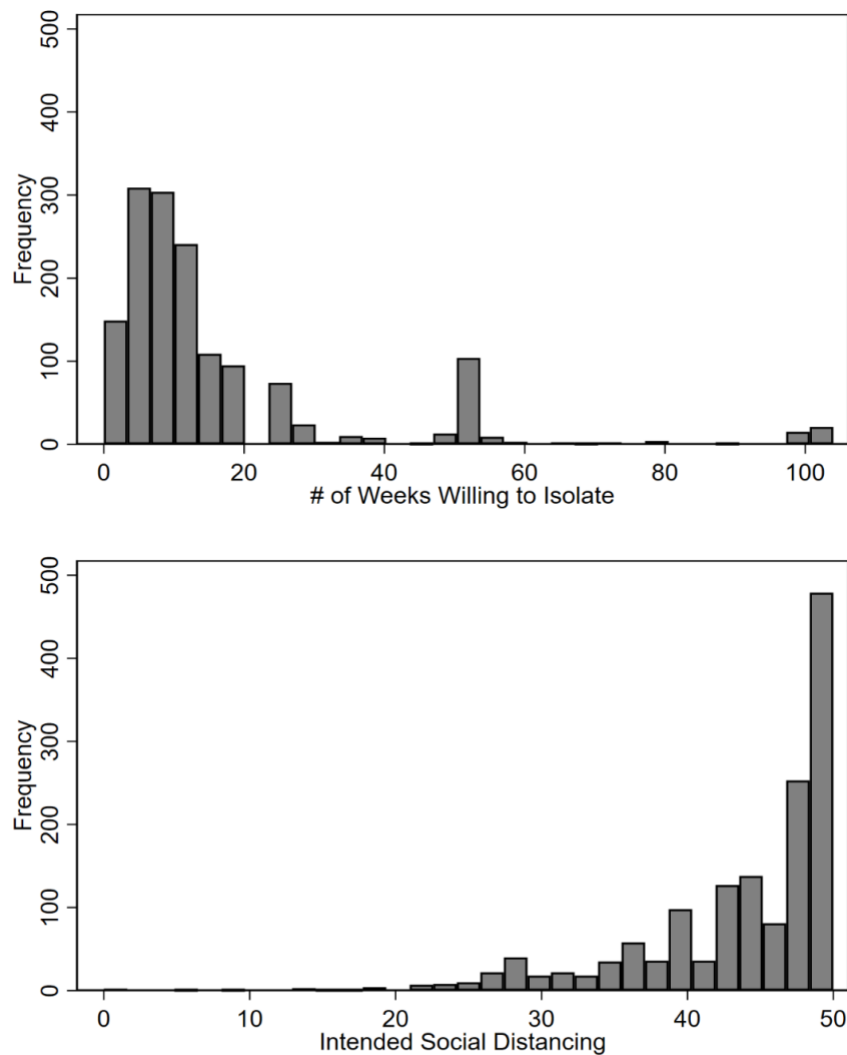
All versions of the text were constructed with the aim of appealing to a broad audience, including those who do not perceive themselves to be at high personal risk from the virus. The different treatment texts, however, appeal to prosocial motivation and empathy in different ways and to varying degrees. Compared to the others, treatment 1 appeals most directly to a sense of self-interest rather than to prosocial motivation or empathy. By referring to the respondent's personal health, it is particularly targeted at appealing to the self-interest of those least inclined to feel that the virus poses a serious risk to themselves. While the leading sentence of treatment 1 emphasizes self-interest, we also acknowledge that the information about the serious effects of the virus on young, healthy adults may serve as motivating information for people weighing prosocial concerns since this information highlights the danger of the virus to everyone. Treatment 2 appeals to concern for the people in one's life whom one typically care about the most. By emphasizing close friends and family, it relates to prosocial motivation and empathy for specific, familiar others (rather than for people in general). In contrast, Treatments 3 and 4 appeal more directly to a sense of broader collective responsibility; prosocial and emphatic concern for the well-being of other people in general. Treatment 3 highlights the critical nature of meeting this collective responsibility by mentioning the risk of death for fellow citizens in at-risk groups while treatment 4 describes the challenge we face at a systems level if so many people are simultaneously sick that they overwhelm the healthcare system. Thus, while both treatments appeal to prosocial motivation and empathy, treatment 3 is perceivably related more to a 'logic of appropriateness' than treatment 4, which is more in tune with a 'logic of consequentiality' (March & Olson, 2004).

### ***Measures***

We estimate effects in relation to two primary outcomes capturing distinct aspects of social distancing compliance. Both measures were constructed in a manner that was intended to mitigate the problem of a "ceiling effect," whereby variation in the variable is limited because most respondents indicate the maximum value of the variable. First, respondents were asked to report the maximum duration (number of weeks) for which they could see themselves maintaining social distancing, if officials advised it.<sup>5</sup> Exact item wording for all measures appears in the Appendix. We believe this measure of duration of willingness to socially distance is particularly salient for understanding the public's expectations and intentions since there has been considerable ambiguity regarding when social distancing measures might be relaxed. Furthermore, concerns have been repeatedly raised in the public discourse about the sustainability of maintaining aggressive social distancing practices for long periods of time (Geraghty, 2020; Brumfiel, 2020). In our sample, we observe a relatively high willingness to engage based on this measure of social distancing (mean = 16.9 weeks; SD = 19.7). The median respondent indicates they can see themselves socially distancing for 10 weeks, but many respondents indicated much longer time periods, as can be seen in the top panel of Figure 1. Some respondents entered extremely large numbers, and we did not want these few outliers to dominate our results. Thus, we winsorized the variable (values for 12 respondents were changed), such that the maximum value of the variable in our dataset is 104 weeks (two years); this winsorized version of the variable is used in all analyses.

For our second outcome measure, participants responded to five items capturing intended social distancing behavior within the next few weeks (possible range 0-10, anchored at 0 = 'strongly disagree' and 10 = 'strongly agree'). We identified the next few weeks as the time frame during which intended behavior should be described because that timeframe was long enough to include several days during which the applicability of current guidelines had recently been questioned by the President.<sup>6</sup> Sample items read "I will meet with friends or relatives who live outside my own household" and "I will make the fewest possible trips to the grocery store." We generated an additive index of social distancing based on the five items (Cronbach's  $\alpha = .73$ ). We again observe a relatively high willingness to engage in the type of social distancing reflected in this measure. The distribution is skewed and appears to be right-censored, but there is still substantial variation and the majority of responses do not hit the ceiling<sup>7</sup> of the additive scale (mean = 43.7; median = 46; SD = 7.3). The bottom half of Figure 1 shows a histogram for this variable.

**Figure 1**  
**Distribution Plots of Primary Outcome Measures**



As secondary outcomes, we estimate effects on a selection of COVID-19-related attitudes and beliefs that we capture using four survey items (possible range 0-10, anchored at 0 = ‘strongly disagree’ and 10 = ‘strongly agree’). The four items were: (a) “The COVID-19 pandemic is the single biggest threat to society in our time” (mean = 6.9; SD = 2.8); (b) “Reducing the number of deaths caused by COVID-19 is more important than economic concerns” (mean = 8.3; SD = 2.2) (c) “We have to keep the economy going even if this means more people die from COVID-19” (mean = 2.6; SD = 2.7); and (d) “The government should require all non-essential businesses in my area to close their on-site operations for at least the next two weeks” (mean = 8.5; SD = 2.2).

As mentioned, we perform subsequent sensitivity analyses testing for heterogeneous treatment effects. In particular, we test for differences by demographic characteristics, i.e., gender (female vs. male), age (below 35 vs. 35+), race (White vs. non-White), and education (associate degree or lower vs. bachelor’s degree or higher). Moreover, we test for differences by political affiliation (Democrats versus Republicans) and news consumption (those who say they have followed news about COVID-19 “very closely” versus those who indicate less attention to such news). Finally, we also test for differences among those exhibiting relatively high- and low-levels of prosocial motivation and empathy, each of which are measured based on previously-validated items (Grant, 2008; Konrath, Meier, & Bushman, 2018).<sup>8</sup>

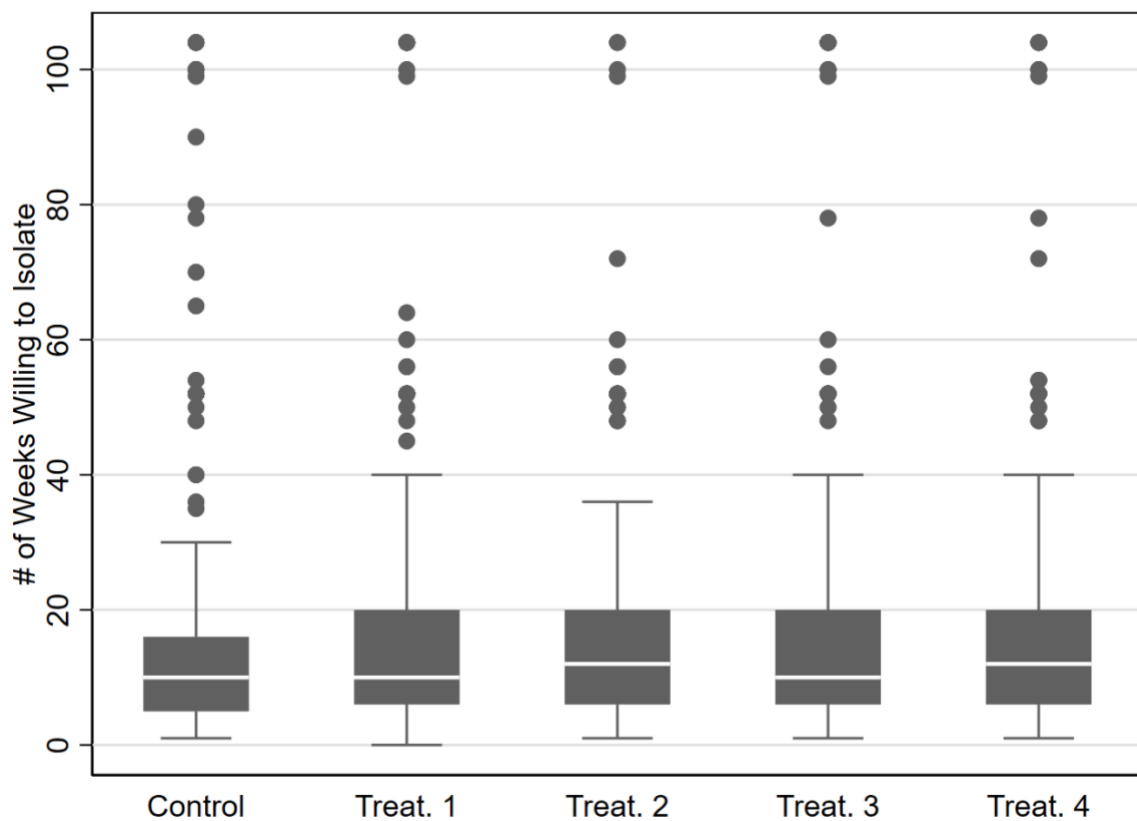
## Results

### *Social Distancing*

#### *Effects on the Duration Willingness*

A one-way ANOVA shows that duration of willingness to adhere to social distancing does not significantly differ (at Bonferroni critical value = .025)<sup>9</sup> among experimental conditions,  $F(4, 1497) = .10, p = .98$ . Figure 2 illustrates this finding. The estimated effect size, Cohen's  $f = .02$ , is well below .10—the benchmark typically used for a small effect. Dropping outliers (i.e., greater than two standard deviations from the mean) does not change the results.

**Figure 2**  
Social Distancing (Duration Willingness) Depending on Experimental Condition



Notes: For each experimental condition, a boxplot was constructed to indicate the quartile values of the outcome (top and bottom of boxes indicate 25<sup>th</sup> and 75<sup>th</sup> percentiles; white line indicates median; whiskers indicate minimum and maximum values no farther than 1.5 times the interquartile range from the box; outlier values depicted as dots).

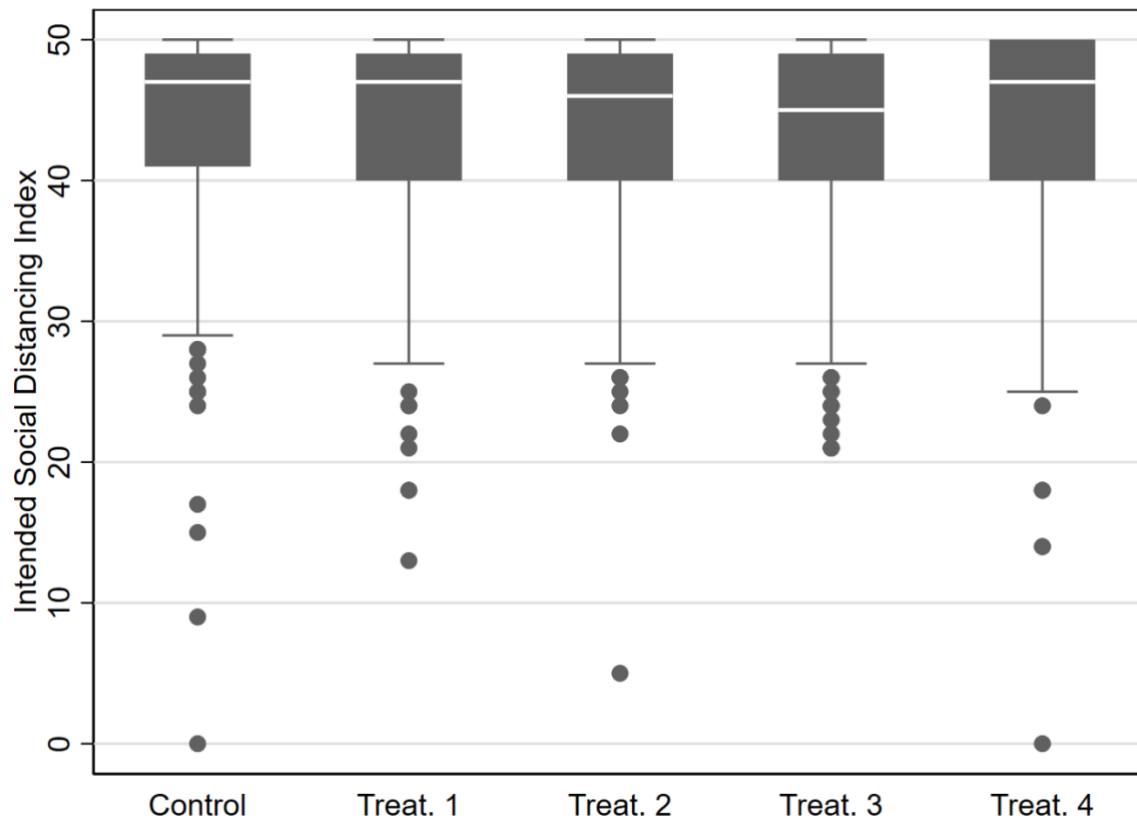
Linear regression analyses with robust standard errors produce similar results (see the Appendix, Table A-1). The null-finding is robust—also if controlling for demographics (gender, age, race, education) or dropping outliers.

#### *Effects on Social Distancing Behavior*

Looking at intended social distancing behaviors instead of duration of willingness does not change the general finding and take-away: Social distancing compliance does not appear to be affected significantly by our COVID-

19 informational cues (at Bonferroni critical value = .025). A one-way ANOVA provides no evidence that social distancing behavior—as captured by our index measure—differs between experimental conditions,  $F(4, 1494) = .22, p = .93$ . Relative to the typical benchmark for a small effect (.10), we find a negligible estimated effect size, Cohen's  $f = .02$ . Figure 3 illustrates this finding.

**Figure 3**  
**Social Distancing (Behavior) Depending on Experimental Condition**



Notes: For each experimental condition, a boxplot was constructed to indicate the quartile values of the outcome (top and bottom of boxes indicate 25<sup>th</sup> and 75<sup>th</sup> percentiles; white line indicates median; whiskers indicate minimum and maximum values no farther than 1.5 times the interquartile range from the box; outlier values depicted as dots).

As before, linear regression analysis (without and with control for demographics) does not change the result (Appendix, Table A-1). Neither does further analysis estimating effects separately for each of the individual index items (Appendix, Table A-2).

#### *Robustness Analyses*

To further probe the robustness of the null-findings, we have analyzed the data using both Kruskal-Wallis tests (accommodating non-normal distributions of outcomes)<sup>10</sup> and multivariate regression (accounting for covariance between the two outcome measures) (Appendix, Table A-2). The results are qualitatively similar to those produced using one-way ANOVA and OLS regression. We also consider whether we have found a precise null by examining the 90% confidence intervals from our initial regression models (Appendix, Table A-1). Based on the confidence intervals, we rule out the possibility that any of our treatments affected either of our outcomes by more than 0.2 standard deviation units.<sup>11</sup>

### *Subgroup Analyses*

In line with our preregistration analysis plan, we conduct subgroup analyses testing for heterogeneous effects by demographic characteristics, political affiliation, news consumption, prosocial motivation, and empathy.

We find no consistence evidence of heterogeneous treatment effects (Appendix, Tables A-3 and A-4). The results are suggestive of treatment 1 potentially being more effective at positively changing intended social distancing behaviors for men and for white respondents; however, the estimated effect sizes are small and do not reach significance when the dependent variable is duration of willingness to social distance. When looking at the duration of willingness to social distance, there is some evidence that those with relatively low levels of empathy appear to react more positively to treatment 1 (the most direct appeal to self-interest) and perhaps also to treatments 2 and 4, but once again this moderation effect disappears when looking at the other outcome measure (index of intended social distancing behaviors).

It is also interesting to note the extent to which these various demographic factors and attitudes covary directly with social distancing measures. Values of the intended social distancing behavior index are generally higher among women, Democrats, people who follow COVID-19 news very closely, people with high prosocial motivation, and people who indicate high levels of empathy. Significant associations are generally absent for the duration-based measure of willingness to distance, with one notable exception: highly empathetic respondents say they can see themselves isolating for eight weeks longer, on average.

### ***COVID-19-related Attitudes and Beliefs***

Given that many social distancing behaviors were required by government mandate at the time of our study and that behaviors may be difficult to change, we also test for any effects of our treatments on four distinct measures of COVID-19 related attitudes and beliefs. We again find almost entirely null results (Appendix, Table A-5). For each measure of an attitude or belief, the model F-test is insignificant, indicating we cannot reject the null hypothesis that all treatments had no effect.

## **Discussion and Conclusion**

Using data from a pre-registered survey experiment design among 1,502 US residents, we find that COVID-19 information cues—priming prosocial motivation and empathy in different ways and to varying extents—are not associated with substantial differences in social distancing compliance. Whether analyzing the duration that respondents are willing to adhere to social distancing, an index of intended social distancing behavior, or items on COVID-19-related attitudes and beliefs, we observe no significant differences in means across our five experimental conditions (at  $p < .05$ ). Sensitivity analyses reveal similar results. We detect no substantive pattern of variation in primary outcomes across experimental conditions for particular subpopulations of respondents. Our COVID-19 information cues do not shape reported social distancing, not even among the individuals who may be least likely to engage in social distancing (i.e., males, younger people, those with less education, Republicans, and those have not followed the news about the COVID-19 situation very closely). The lack of detectable effects, even among populations that we might expect to be less inclined to socially distance or less saturated with prior messaging, casts doubt on the notion that public officials can improve on existing efforts by targeting dissemination of messages to specific groups (perhaps because the topic of COVID-19 has so dominated our society that virtually everyone has already been saturated with messages).

What are the implications of these findings to research and practice? In terms of theory contribution, previous research demonstrates the effects of information that primes the perception that a particular behavior or task has a prosocial impact on others and society (Grant et al., 2007; Grant & Hofmann, 2011; Belle, 2013; Kropf & Blair, 2005; Pedersen, 2015; Shim et al., 2012). Expanding on these insights, this article delineates the potential scope boundaries of such approaches. The COVID-19 pandemic represents a public health crisis associated both with widespread public concern and with massive media coverage about the outbreak and the importance of social distancing. Thus, our findings suggest that informational cues targeting prosocial motivation and empathy may shape judgements and decision-making across a range of settings, but perhaps mostly for issues that are of lower salience and to which people tend to devote less deliberation and conscious thought. Put differently, such informational cues may be most effective at altering weakly-held or weakly-informed opinions and their associated behaviors.



Or perhaps a main factor driving our results is the timing of our data collection. Prosocial information cues may have been effective in convincing the public of the need for ongoing social distancing behaviors during earlier stages of the pandemic. However, by the time our survey was fielded (April 3), these behaviors were already widely being practiced and additional messages of this nature may have lost their potency. This would suggest a type of diminishing returns, whereby initial returns to prosocial messaging are substantial, but after the public has been saturated with such messages, further informational cues push people no further toward adherence to social distancing (nor do they spark a backlash). As such, our estimates may be considered lower-bound estimates (i.e., surveying the same individuals a few weeks prior may have resulted in discernable differences across experimental conditions). On the other hand, although we observe relatively high mean levels of social distancing across outcome measures, the responses still exhibit substantial variation. In part, this is the result of employing measures that were constructed with the intent of mitigating “ceiling effects” (i.e., that everybody were already highly compliant with social distancing recommendations). Our measure of duration of willingness to socially distance takes as a given that many people are already staying home as much as possible but reveals substantial heterogeneity in terms of how long people see themselves continuing such measures provided that officials continue to advise staying at home. Though our index of intended social distancing behavior is more likely subject to a ceiling effect, we still find substantial variation by including questions about activities that may be allowable under stay-at-home orders, such as making more than the necessary number of trips to the grocery store or declining to encourage others to adhere to social distancing guidelines. The fact that our outcome measures exhibit substantial variation even under conditions of fairly strict stay-at-home orders suggests that they may offer a measurement approach appropriate for other studies of compliance with social distancing recommendations.

Another point for consideration is the intensity of our prosocial appeals. Some other COVID-19-related studies have employed higher-intensity treatments, such as posters or videos, and have found evidence that they promote social distancing.<sup>12</sup> On this basis, information aimed at priming of prosocial motivation and empathy may be effective means for ensuring social distancing compliance, but transmitting this information via text alone may not be sufficient. Observable effects may require more visual imagery. Supporting this notion, another COVID-19-related study (Utych & Fowler, 2020) finds that text treatments highlighting the risk to older adults or to younger adults have no discernable effects on contamination-reducing behavior (i.e., intent related to hand-washing, coughing in one’s elbow, and staying at home) in a sample of US Mturkers.

Relatedly, our findings suggest the need for future research on the psychological and socio-structural mechanisms explaining why specific subpopulations of individuals (e.g., men, Republicans) are less engaged in social distancing. Such insights could help inform the design of interventions that may effectively encourage social distancing among the individuals who are least disposed toward such behavior.

In terms of insights for practice, this article offers some good news. Although we do observe variance, most of the individuals in our sample of US residents appear cognizant about the importance of social distancing. As for helping to mitigate the spread of the coronavirus, many respondents report being highly engaged in social distancing behavior, and many are reportedly willing, if officials advised it, to maintain social distancing for several weeks. Moreover, our experimental (null) findings should not necessarily discourage public authorities from appealing to prosocial motivation and empathy in their continued efforts to have people engage in and maintain social distancing. We believe this to be true for the present COVID-19 pandemic, as well as for similar virus outbreaks that may occur in the future. As mentioned, our estimates may be lower bound estimates at worst, and we find no indications of any harmful or negative treatment effects. Another approach suggested by Barari et al. (2020) is to focus messaging on ideas for how to make isolation “easier and more frictionless” (p. 14) rather than focusing only on the dangers presented by leaving home. Finally, we cannot dismiss the potential power of a “messenger effect”—informational cues from, say, politicians or public health officials may have substantially greater effects on social distancing compliance, especially among residents of their jurisdiction, than information cues from a group of unfamiliar researchers. In speeches to their nations, monarchs in Denmark, Sweden, and the UK have addressed the importance of community spirit and prosocial behavioral responsibility in the face of the COVID-19 situation. In the US, similar endeavors to motivate collection action and unify the people should rest, ideally, with the presidency.

## Notes

1. For our study, participants were recruited to complete a five-minute survey on “Coronavirus (COVID-19) Perceptions” in exchange for \$0.55. One reason we sourced our respondents through Prolific rather than Amazon’s Mechanical Turk is that Prolific has put in place a set of extensive measures to guard against a single individual setting up multiple user accounts (see Bradley, 2018).
2. Attention checks took the form of “This is an attention check. Please click [specified response option varying across attention check items].” 94% of respondents (1,410) passed all three attention checks, and 99.9% (1,501) passed at least two of the three checks.
3. The survey was approved by the Institutional Review Board for Protection of Human Subjects in Research (IRB) at American University (protocol #: IRB-2020-299), and respondents gave informed consent to participate in research. Preregistration is available at <https://www.socialscisceregistry.org/trials/5611>, and replication materials are posted at <https://doi.org/10.7910/DVN/1LIIDV>.
4. Partial responses from five participants were discarded because they dropped out prior to treatment. One respondent completed the survey twice, so we discarded that person’s second set of responses.
5. Answers to this item were entered into an open textbox (which required a numerical input) because we did not want to prime respondents to have any particular maximum value in mind based on a set of pre-constructed response options.
6. Specifically, President Trump had publicly indicated that restrictions might be loosened in time for Easter (only 9 days away when the survey was fielded), before eventually walking back this suggestion on March 29.
7. 24% of respondents indicate maximum social distancing on all five measures.
8. Responses to the prosocial motivation and empathy items were captured on a five-point Likert scale, and these variables were each converted to binary variables in order to sort respondents into groups based on high- versus low- expression of the trait. Prosocial motivation is captured by an index comprising an adapted version of a four-item scale by Grant (2008) (Cronbach’s  $\alpha = .92$ ). A summative prosocial motivation index was turned into a binary variable indicating whether the index (range: 4-20) takes on a value of 17 or greater (62% of responses), a threshold which indicates the average response was greater than the “somewhat agree” option. Empathy is captured by the Single Item Trait Empathy Scale (SITES)—an item developed and validated by Konrath et al. (2018). A binary empathy variable was created to indicate whether the respondents “strongly agree” with this item.
9. We use an alpha level of .05 and correct for two tests since we conduct one F-test for each of two primary outcomes. Thus, Bonferroni critical value is computed as  $.05/2=.025$ .
10. Kruskal-Wallis tests generate a p-value of .51 (chi-squared=3.29; df=4) when the outcome is duration of willingness to distance and a p-value of .41 (chi-squared=3.98; df=4) when the outcome is the intended social distancing behaviors index.
11. This approach for assessing the precision of our null is equivalent to conducting two one-sided hypothesis tests with an alpha of .05 (Rainey, 2014). Using .2 standard deviation units as the threshold for our equivalence bounds (+/- 3.93 units for our duration measure and +/- 1.45 units for our intended social distancing behavior index), we find consistent evidence of equivalence since the 90% confidence intervals for treatment effects are fully contained within the upper and lower equivalence bounds in every instance.
12. Lunn et al. (2020) finds that informational posters depicting photographs of real people along with text describing transmission to vulnerable people or large numbers of people can motivate social distancing in Ireland. Pfattheicher et al. (2020) shows that a video inducing empathy for those most vulnerable to the virus promotes the motivation to adhere to physical distancing in Germany.

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## Appendix

### Survey Items

Willingness to adhere to social distancing (single item)

*“What is the longest amount of time you could see yourself staying at home as much as possible and avoiding all social contact (i.e., adhering to so-called “social distancing”)?”*

*If officials advised it, I could see myself generally staying at home and avoiding social contact for up to [text box requiring whole-number] weeks.”*

Social distancing behavior (five items, randomized order)

*“To what extent do you agree with the following statements? During the next few weeks...*

*(a) I will meet with friends or relatives who live outside my own household. [reversed]*

*(b) I will make the fewest possible trips to the grocery store.*

*(c) I will be at places where other people will also be (café, restaurant, specialty shops, church, etc.). [reversed]*

*(d) I will avoid all social gatherings (i.e., adhere to so-called “social distancing”).*

*(e) I will strongly encourage others to avoid all social contact (i.e., adhere to so-called “social distancing”).”*

[Response options: 0-10 slider, anchored at Strongly disagree and Strongly agree]

COVID-19-Related Attitudes and Beliefs (four items, randomized order)

*“To what extent do you agree with the following statements?*

*(a) The COVID-19 pandemic is the single biggest threat to society in our time.*

*(b) Reducing the number of deaths caused by COVID-19 is more important than economic concerns.*

*(c) We have to keep the economy going even if this means more people die from COVID-19.*

*(d) The government should require all non-essential businesses in my area to close their on-site operations for at least the next two weeks. “*

[Response options: 0-10 slider, anchored at Strongly disagree and Strongly agree]

Political affiliation (single item)

*“What is your preferred political party?”*

[Response options (randomized order): Republican, Democratic, Other]

News consumption (single item)

*“How closely have you been following news about coronavirus (COVID-19)?”*

[Response options: Very closely, Fairly closely, Not too closely, Not at all closely]

Prosocial Motivation (four items, randomized order)

*“To what extent do you agree with the following statements?*

*(a) I care about benefiting others through my actions.*

*(b) I want to help others through my actions.*

*(c) I want to have a positive impact on others through my actions.*

*(d) It is important to me to do good for others through my actions.”*

Empathy (single item, included in battery with prosocial motivation items, randomized order)

*“To what extent do you agree with the following statements?*

*(a) I am an empathetic person.”*

[Response options: Strongly disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Strongly agree]

**Table A-1. Effects on Social Distancing**

	(1) Duration		(2) Duration	(3) Duration w/o Outliers	(4) Dist. Index		(5) Dist. Index
	b/se	90% ci	b/se	b/se	b/se	90% ci	b/se
Treat. 1	0.451 (1.726)	(-2.389, 3.292)	0.254 (1.749)	1.834 (1.143)	0.094 (0.591)	(-0.879, 1.067)	-0.085 (0.578)
Treat. 2	-0.200 (1.633)	(-2.888, 2.488)	-0.044 (1.626)	2.351* (1.144)	-0.178 (0.597)	(-1.161, 0.804)	-0.140 (0.584)
Treat. 3	-0.389 (1.696)	(-3.180, 2.402)	-0.260 (1.686)	0.931 (1.082)	-0.417 (0.585)	(-1.381, 0.546)	-0.388 (0.572)
Treat. 4	-0.444 (1.646)	(-3.152, 2.265)	-0.137 (1.664)	1.441 (1.075)	-0.131 (0.629)	(-1.167, 0.904)	-0.275 (0.614)
Female			-1.530 (1.007)				2.569** (0.376)
Non-Binary Gender			13.781* (6.191)				3.476** (1.129)
Age (10-Yr. Increments)			0.363 (0.415)				0.495** (0.139)
White			1.109 (1.114)				0.354 (0.404)
Education			-0.486 (0.356)				0.016 (0.134)
Constant	17.064** (1.262)		17.550** (2.236)	13.028** (0.766)	43.819** (0.432)		40.537** (0.843)
F-statistic	0.100		1.328	1.264	0.236		8.746
F P-value	0.983		0.217	0.282	0.918		0.000
R-sqr	0.000		0.013	0.003	0.001		0.043
N	1502		1489	1453	1499		1486

*Notes.* \*  $p < 0.05$ , \*\*  $p < 0.01$  (two-tailed). Robust standard errors in parentheses; for models 1 & 4, 90% confidence intervals also shown in parentheses under column labeled “90% ci” (lower bound, upper bound). For models 1-3, the dependent variable indicates the maximum number of weeks the respondents can imagine themselves isolating. For models 4-5, the dependent variable is an index of intended social distancing behaviors. In model 3, all observations with values of the dependent variable more than two standard deviations from the mean ( $> 56$  weeks) are dropped (note that values of this dependent variable larger than 104 weeks (two years) were winsorized (replaced with the value 104) prior to calculating the mean and standard deviation for identifying outliers).

**Table A-2. Individual Items from Social Distancing Index and Multivariate Regression**

	(1)	(2)	(3)	(4)	(5)	(6)	
	Item 1	Item 2	Item 3	Item 4	Item 5	Duration	Dist. Index
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Treat. 1	-0.072 (0.205)	0.027 (0.141)	-0.314 (0.171)	-0.204 (0.159)	-0.115 (0.171)	0.443 (1.610)	0.094 (0.595)
Treat. 2	-0.060 (0.204)	0.094 (0.135)	0.128 (0.196)	-0.124 (0.151)	-0.081 (0.167)	-0.200 (1.608)	-0.178 (0.594)
Treat. 3	0.096 (0.203)	0.031 (0.129)	-0.071 (0.179)	-0.224 (0.154)	-0.200 (0.171)	-0.389 (1.608)	-0.417 (0.594)
Treat. 4	-0.152 (0.199)	-0.164 (0.155)	-0.117 (0.182)	-0.227 (0.160)	-0.037 (0.173)	-0.402 (1.612)	-0.131 (0.596)
Constant	1.602** (0.147)	8.846** (0.100)	1.258** (0.134)	9.207** (0.101)	8.625** (0.123)	17.064** (1.139)	43.819** (0.421)
F-statistic	0.444	0.781	1.785	0.809	0.407	0.095	0.216
F P-value	0.777	0.538	0.129	0.519	0.804	0.984	0.930
R-sqr	0.001	0.003	0.004	0.002	0.001	0.000	0.001
N	1499	1500	1500	1500	1500	1499	

Notes: \*  $p < 0.05$ , \*\*  $p < 0.01$  (two-tailed). Robust standard errors in parentheses (robust option not used for model 6). Model 6 is a multivariate regression.



**Table A-3. Heterogeneous Effects by Demographic Characteristics**

	DV: Duration				DV: Behavior Index			
	(1) Female b/se	(2) 35+ b/se	(3) White b/se	(4) College b/se	(5) Female b/se	(6) 35+ b/se	(7) White b/se	(8) College b/se
Treat. 1	1.146 (2.466)	2.200 (2.199)	-3.028 (2.970)	-1.158 (2.857)	1.299 (0.926)	-0.004 (0.728)	-1.964 (1.040)	-0.343 (0.900)
Treat. 2	0.652 (2.306)	0.001 (2.027)	-1.617 (3.074)	-1.912 (2.739)	0.884 (0.917)	-0.573 (0.739)	-1.269 (0.980)	-1.148 (0.952)
Treat. 3	1.340 (2.473)	-0.232 (2.035)	-1.142 (3.175)	-1.342 (2.865)	0.352 (0.874)	-0.897 (0.731)	-0.868 (0.930)	-1.122 (0.918)
Treat. 4	1.297 (2.386)	1.585 (2.157)	-0.726 (3.008)	-1.126 (2.754)	0.442 (1.008)	-0.558 (0.781)	-1.115 (1.006)	-0.309 (0.968)
Moderator	0.504 (2.499)	2.222 (2.669)	-0.536 (2.936)	-2.952 (2.626)	4.147** (0.826)	0.448 (0.915)	-0.614 (0.894)	-0.500 (0.880)
Mod. X T1	-1.594 (3.477)	-4.581 (3.568)	5.364 (3.680)	2.801 (3.551)	-2.800* (1.174)	0.177 (1.242)	3.086* (1.257)	0.757 (1.196)
Mod. X T2	-1.895 (3.179)	-0.559 (3.414)	2.158 (3.642)	3.071 (3.365)	-1.952 (1.158)	1.006 (1.247)	1.559 (1.232)	1.792 (1.213)
Mod. X T3	-3.512 (3.299)	-0.430 (3.607)	0.844 (3.771)	1.748 (3.513)	-1.474 (1.137)	1.240 (1.215)	0.559 (1.195)	1.236 (1.191)
Mod. X T4	-2.624 (3.302)	-4.867 (3.387)	0.445 (3.615)	1.215 (3.394)	-1.221 (1.238)	0.890 (1.305)	1.418 (1.284)	0.316 (1.274)
F-statistic	0.498	0.546	0.608	0.291	6.776	1.222	1.365	0.505
F p-value	0.877	0.842	0.791	0.978	0.000	0.277	0.199	0.872
R-sqr	0.002	0.003	0.003	0.002	0.038	0.007	0.008	0.003
N	1472	1501	1492	1501	1469	1498	1489	1498

Notes: \*  $p < 0.05$ , \*\*  $p < 0.01$  (two-tailed). Robust standard errors in parentheses. Moderator variable for each model listed below model number.

**Table A-4. Heterogeneous Effects by Other Attitudes/Behaviors**

	DV: Duration				DV: Behavior Index			
	(1) Democrat b/se	(2) News b/se	(3) Prosoc. b/se	(4) Empathy b/se	(5) Democrat b/se	(6) News b/se	(7) Prosoc. b/se	(8) Empathy b/se
Treat. 1	-3.242 (3.649)	3.386 (2.438)	2.695 (2.687)	4.373* (2.098)	2.183 (1.931)	0.169 (0.866)	0.482 (1.099)	0.846 (0.849)
Treat. 2	-2.106 (3.832)	0.270 (2.198)	1.532 (2.427)	2.889 (1.908)	2.755 (1.767)	-0.312 (0.877)	0.500 (1.069)	0.433 (0.849)
Treat. 3	0.331 (4.367)	-0.528 (2.096)	-1.601 (2.240)	1.471 (1.816)	1.411 (1.828)	-0.636 (0.842)	-0.351 (1.064)	0.368 (0.804)
Treat. 4	-0.122 (4.132)	0.002 (2.169)	0.847 (2.337)	3.115 (1.823)	2.912 (1.781)	-0.769 (0.963)	-0.627 (1.131)	-0.035 (0.882)
Moderator	-0.345 (3.511)	1.814 (2.531)	2.875 (2.418)	8.183** (2.609)	4.755** (1.552)	2.592** (0.851)	2.867** (0.920)	3.480** (0.840)
Mod. X T1	2.715 (4.110)	-6.041 (3.436)	-3.560 (3.510)	-8.491* (3.512)	-2.555 (2.035)	-0.075 (1.162)	-0.645 (1.286)	-1.684 (1.158)
Mod. X T2	2.304 (4.270)	-0.926 (3.270)	-2.761 (3.263)	-6.873* (3.334)	-3.238 (1.879)	0.349 (1.170)	-1.083 (1.276)	-1.545 (1.173)
Mod. X T3	0.003 (4.807)	0.587 (3.458)	2.059 (3.257)	-3.688 (3.504)	-2.283 (1.941)	0.884 (1.137)	-0.015 (1.251)	-1.515 (1.147)
Mod. X T4	0.190 (4.518)	-0.878 (3.300)	-2.004 (3.236)	-7.683* (3.379)	-3.586 (1.917)	1.410 (1.219)	1.059 (1.328)	0.096 (1.209)
F-statistic	0.385	0.601	0.846	1.871	2.482	8.574	5.499	5.885
F p-value	0.943	0.797	0.574	0.052	0.008	0.000	0.000	0.000
R-sqr	0.002	0.004	0.004	0.012	0.026	0.047	0.036	0.034
N	1236	1502	1501	1501	1233	1499	1498	1498

Notes: \*  $p < 0.05$ , \*\*  $p < 0.01$  (two-tailed). Robust standard errors in parentheses. Moderator variable for each model listed below model number.

**Table A-5. Effects on COVID-19-Related Attitudes and Beliefs**

	(1) Biggest Threat b/se	(2) Reduce Deaths b/se	(3) Protect Economy b/se	(4) Close Business b/se
Treat. 1	0.020 (0.238)	-0.375* (0.185)	0.057 (0.210)	-0.284 (0.184)
Treat. 2	0.103 (0.231)	-0.216 (0.176)	0.412 (0.223)	-0.134 (0.167)
Treat. 3	-0.116 (0.228)	-0.285 (0.179)	0.137 (0.212)	-0.244 (0.173)
Treat. 4	-0.106 (0.229)	-0.088 (0.172)	0.169 (0.221)	-0.322 (0.180)
Constant	6.946** (0.164)	8.445** (0.121)	2.431** (0.147)	8.682** (0.118)
F-statistic	0.326	1.361	0.968	1.093
F p-value	0.861	0.245	0.424	0.359
R-sqr	0.001	0.004	0.003	0.003
N	1502	1502	1502	1502

*Notes:* \*  $p < 0.05$ , \*\*  $p < 0.01$  (two-tailed). Robust standard errors in parentheses.