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When does knowing better mean doing better? Trust in President Trump and in scientists moderates the relation between COVID-19 knowledge and social distancing

Javier A. Granados Samayoa[1], Benjamin C. Ruisch[2], Courtney A. Moore[1], Shelby T. Boggs[1], Jesse T. Ladanyi[1], & Russell H. Fazio[1]

[1] Department of Psychology, The Ohio State University, Columbus, Ohio, USA

[2] Institute of Psychology, Leiden University, 2300 RB Leiden, The Netherlands

Correspondence concerning this article should be addressed to Russell H. Fazio, Department of Psychology, The Ohio State University, 1835 Neil Avenue, Columbus, Ohio 43210. Telephone: 614-688-5408. Email: fazio.11@osu.edu.

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Abstract

In response to the COVID-19 pandemic, scientists have sought to better understand the psychological characteristics associated with adoption of preventative behaviors. Several studies point to knowledge about the virus, trust in government officials, and trust in scientists as reliable predictors of social distancing, yet the exact nature of the relations between these predictor variables remains unexplored. Examining these relations in a study involving 998 participants, we found that less trust in former President Trump's ability to guide the nation through the COVID-19 crisis and greater trust in scientists predicted greater COVID-19 knowledge. In turn, greater COVID-19 knowledge predicted greater social-distancing behavior, and did so most strongly among those who reported (1) relatively low levels of trust in Trump and (2) relatively high levels of trust in scientists. These findings add a layer of complexity to our understanding of how knowledge about an issue and trust in authority figures shape behavior, suggesting that in addition to predicting the amount of knowledge people have on a certain issue, trust may play role in influencing the perceived validity of that knowledge as a basis for behavior. The implications of this work for campaigns aimed at increasing compliance with scientific guidelines are discussed.

Keywords: trust in scientists; trust in government; knowledge; misinformation; COVID-19; social distancing; Donald Trump

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1. Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has quickly spread around the globe, leaving millions of people infected with the coronavirus disease 2019 (COVID-19). Even with the development of vaccines for COVID-19, scientists and government officials have continued to encourage the adoption of preventative behaviors to slow the virus' spread, with social distancing—the intentional physical separation between people—perhaps being chief among them. Despite these pleas and the danger of the virus, evidence suggests many individuals are not social distancing (Cook, 2020).

To understand adherence to social distancing guidelines, researchers have conducted large-scale studies. One variable that has received attention is people's knowledge about the virus. Indeed, failure to comply with scientific recommendations is sometimes believed to be the result of a knowledge deficit (Schultz, 2002). Stated differently, researchers and policy makers sometimes assume that if people *knew better*, they would *do better*. Consistent with this belief, self-reported COVID-19 knowledge predicts self-reported social distancing (Qazi et al., 2020), and objective knowledge predicts self-reported and virtually-simulated distancing behavior (Fazio et al., 2021a).

Other work suggests that trust in government officials and scientists also predicts social distancing. Greater trust in scientists reliably predicts preventative behavior, including social distancing, across different nations and populations (e.g., Dohle, Winger, & Schreiber, 2020; Plohl & Musil, 2020)—likely reflecting the virtually unanimous support for social distancing within the scientific community. However, no such unanimity exists among government officials. For example, in Germany—where Chancellor Angela Merkel and the federal states aligned in their support for preventative measures (Bennhold & Eddy, 2020)—trust in politicians

predicts greater social distancing (Dohle et al., 2020). Conversely, in the U.S.—where former President Trump downplayed the virus' severity (Paz, 2020)—trust in the former President predicts *less* distancing (Fazio et al., 2021a).

This research suggests that virus knowledge and trust in both government officials and scientists play a role in understanding social-distancing behavior.[1] However, our understanding of these factors—and how they may interact or interrelate with one another—remains limited. For example, does COVID-19 knowledge predict social distancing irrespective of trust in government leaders and scientists? That is, when people know better, will they invariably do better? Or might knowledge promote distancing only among those who trust the source of that information (i.e., scientists) and distrust competing sources of (mis)information (e.g., former President Trump)? This study provides a unique opportunity to advance our understanding of how scientists and politicians influence individuals' knowledge concerning a public health crisis and, ultimately, their behavioral responses. We can examine how trust in various public officials and the knowledge that individuals accrue combine to shape behavior in a consequential context.

We propose a two-step model in which trust influences knowledge, and the subsequent impact of knowledge on social-distancing behavior itself depends on trust. First, we predict that objectively-assessed COVID-19 knowledge will be negatively associated with trust in former President Trump's ability to guide the nation through the COVID-19 crisis [2] and positively associated with trust in scientists (e.g., because trusting Trump promotes attention to the misinformation he has communicated, whereas trusting scientists promotes attention to

[1] Though COVID-19 knowledge and trust in authority figures are certainly related constructs, they are conceptually and empirically separable (see Supplemental Material for a relevant analysis and discussion).
[2] Calvillo et al. (2020) provide evidence for a causal chain involving political ideology, approval of President Trump, objectively-assessed COVID-19 knowledge, news discernment, and perceived vulnerability to the virus. Similar to what we report here, their data suggest that greater approval of President Trump is associated with less accurate COVID-19 knowledge. However, they did not examine social-distancing behavior.

scientifically-based information). Furthermore, accurate COVID-19 knowledge should promote distancing. However, this relation may be more complex than it appears on its surface. Once knowledge is acquired, it must be deemed valid and meaningful if it is to be used. Thus, we predict that COVID-19 knowledge will interact with (1) trust in former President Trump, such that the knowledge-distancing relation will be attenuated among those highest in trust in Trump (e.g., due to discounting this knowledge), and (2) trust in science, such that the knowledge-distancing relation will be strongest among those highest in trust in science (because they should view this knowledge as more meaningful).

2. Current Research

We collected data in two waves using the Mechanical Turk platform during a time when some states had begun to ease restrictions, but social distancing was still widely encouraged (Wave 1: May 7-8, 2020; Wave 2: June 9, 2020).

Social distancing was assessed using a virtual behavioral measure in which participants are asked to place themselves relative to others in graphical depictions of a variety of realistic scenarios. To complement this novel measure, we also employed a retrospective self-report measure of social distancing. Because self-reports are particularly susceptible to social-desirability concerns and memory biases (Leary & Kowalski, 1990; Ross, 1989), the behavioral measure served as our primary outcome measure. Indeed, recent longitudinal data demonstrate that the virtual behavioral measure is a valid predictor of individuals' likelihood of actually contracting COVID-19, and even does so to a greater extent than a self-report measure of social distancing (Fazio et al., 2021b). However, the interactions reported below regarding the moderating effects of trust in former President Trump and trust in scientists on the relation

between COVID knowledge and social distancing are largely unchanged if self-reports of distancing are used instead. We report these analyses in the Supplemental Material (SM).

Among other measures (see Fazio et al., 2021a), participants completed a 13-item COVID-19 knowledge test, reported their trust in former President Trump and in scientists, and completed demographic questions.

To provide a more comprehensive picture of the evidence, we conducted a pooled analysis across the two waves. To account for differences across time, the data were standardized within wave, and wave was entered as a factor in the analyses. The regression models revealed no significant interactions with wave (p's > 0.16), and thus, this variable is not discussed further.

All relevant measures, manipulations, and exclusions are reported. Study materials, data, and syntax files can be retrieved online: https://osf.io/6gzxd/?view_only=cf218ebfd8ec4ead826637b15e1df95f.

3. Methods

3.1 Participants

Participation was restricted to U.S. workers with 500+ approved HITs and a minimum approval rate of 95%. Sample sizes were chosen to ensure stable correlation estimates (Schönbrodt & Perugini, 2013). A sensitivity analysis revealed that we were 80% powered to detect a small effect ($f^2 = 0.007$; Faul, Erdfelder, Lang, & Buchner, 2007).

In total, 999 MTurk workers completed a ten-minute study for $1.00 (Wave 1 N = 497; Wave 2 N = 502). All participants provided informed consent. One participant was excluded for missing data, leaving 998 participants (445 females, 548 males, 1 not listed, 4 not reported; Age: M = 38.4, SD = 12.1; Political orientation: M = 3.7 on a 1 (Extremely liberal) to 7 (Extremely conservative) scale, SD = 1.8).

Although not nationally representative, the MTurk population is considerably more demographically and ideologically diverse than the college students often used in psychological research (e.g., Paolacci & Chandler, 2014). Furthermore, MTurk samples perform similarly to non-MTurk samples across many tasks and measures (Berinsky, Huber, & Lenz, 2012). Indeed, established relations in the literature (e.g., between disgust sensitivity and perceived vulnerability to disease) are replicated in these data (Fazio et al., 2021a), providing evidence for the validity of these measures in this study. In light of this, and given that our aim is examining relations between our target predictors and outcome, not in assessing the absolute frequency of behaviors in the population, we judged the MTurk sample as providing an appropriate test of our hypotheses.

3.2 Social-Distancing Behavior

Social distancing was assessed through ten graphical scenarios in which participants virtually "distanced" themselves from others (e.g., by moving an interactive slider). For example, participants used a slider to indicate the distance they would leave between themselves and a passerby on the street. In another scenario, they chose between a circuitous but isolated park path versus a crowded but more-direct route. In yet another, they were presented an aerial image of a crowded beach and asked to click on the spot where they would position themselves. All measures are available at http://psychvault.org/social-distancing-measures/. We standardized and averaged the ten measures to index social-distancing behavior (Wave 1 $\alpha = 0.82$; Wave 2 $\alpha = 0.80$).

3.3 COVID-19 Knowledge

To measure COVID-19 knowledge, we employed a 13-item instrument consisting of correct information ("Symptoms of COVID-19 / the coronavirus can appear up to 14 days after

exposure to the virus") and misinformation ("Spraying chlorine on your body will protect you even if COVID-19 / the coronavirus has already entered your system") about the origin, transmission, prevention, and treatment of COVID-19 created using information disseminated by the World Health Organization and Center for Disease Control and Prevention (Faasse et al., 2020). For Wave 2, two items were slightly altered for clarity given developing information about the coronavirus. Participants marked each item as true or false. The total number of correct responses served as our index of COVID-19 knowledge (Wave 1 $\alpha = 0.84$; Wave 2 $\alpha = 0.82$).

3.4 Trust in Former President Trump's Ability to Handle COVID-19 Crisis

We assessed trust in former President Trump's ability to effectively deal with the COVID-19 crisis with the item "How much do you trust President Trump to lead us effectively through the current COVID-19 crisis?", which was rated on a seven-point scale from 0 (Not at all) to 6 (Very much).

3.5 Trust in Scientists

Trust in scientists was assessed using a shortened version of the Trust in Science and Scientists Inventory (Nadelson et al., 2014). To trim the instrument, we selected the 11 (of 21) items with the highest corrected item-total correlations in the original scale-development data. For Wave 2, the item with the lowest item-total correlation was removed. Participants rated their agreement with statements such as "We should trust the work of scientists" on a five-point scale from 1 (Strongly disagree) to 5 (Strongly agree). The average rating served as the measure of trust in scientists (Wave 1 $\alpha = 0.90$; Wave 2 $\alpha = 0.92$).

4. Results

We first examined the predictors of knowledge of factual information about COVID-19. To do so, we simultaneously regressed COVID-19 knowledge on trust in former President

Trump's ability to deal with the COVID-19 crisis and trust in scientists. As hypothesized, greater trust in Trump predicted less COVID-19 knowledge, β = -0.18 (95% CI: -0.24, -0.13), $t(995)$ = -6.44, $p < 0.001$. Conversely, greater trust in scientists predicted more knowledge, β = 0.56 (95% CI: 0.50, 0.62), $t(995)$ = 19.48, $p < 0.001$. Together, these variables accounted for approximately 47% of the variance in COVID-19 knowledge.

Next, we turned to the index of social distancing behavior. We examined the moderating effects of trust on the knowledge-distancing relation by entering the interaction terms between COVID-19 knowledge scores and (1) trust in former President Trump and (2) trust in scientists into the regression model above. The model revealed significant main effects of trust in former President Trump, β = -0.077 (95% CI: -0.15, -0.0038), $t(992)$ = -2.06, p = 0.039, trust in scientists, β = 0.22 (95% CI: 0.13, 0.31), $t(992)$ = 4.85, $p < 0.001$, and COVID-19 knowledge, β = 0.18 (95% CI: 0.08, 0.28), $t(992)$ = 3.52, $p < 0.001$. However, these effects were qualified by significant interactions between trust in Trump and COVID-19 knowledge, β = -0.10 (95% CI: -0.19, -0.013), $t(992)$ = -2.25, p = 0.025, and trust in scientists and COVID-19 knowledge, β = 0.10 (95% CI: 0.0050, 0.20), $t(992)$ = 2.06, p = 0.039.

Decomposing these interactions revealed that among those low in trust in Trump (1 *SD* below the mean), higher COVID-19 knowledge scores significantly predicted greater social distancing, β = 0.28 (95% CI: 0.15, 0.42), $t(992)$ = 4.09, $p < 0.001$. Among those relatively high in trust in Trump (1 *SD* above the mean), however, the knowledge-distancing relation was not significant, β = 0.081 (95% CI: -0.05, 0.21), $t(992)$ = 1.20, p = 0.23. Conceptualized differently, at relatively high levels of knowledge (1 *SD* above the mean), greater trust in former President Trump was significantly associated with less social distancing, β = -0.17 (95% CI: -0.28, -0.068),

$t(992) = -3.25$, $p = 0.0012$, whereas this was not the case at low levels of knowledge (1 *SD* below the mean), $\beta = 0.023$ (95% CI: -0.097, 0.14), $t(992) = 0.38$, $p = 0.70$ (see Figure 1).

[Figure 1 should be inserted here]

Turning to the interaction involving trust in scientists, higher COVID-19 knowledge scores significantly predicted greater social distancing among those high in trust in scientists (1 *SD* above the mean), $\beta = 0.28$ (95% CI: 0.11, 0.46), $t(992) = 3.21$, $p = 0.0013$. However, among those low in trust in scientists (1 *SD* below the mean), the relation between COVID-19 knowledge and social distancing behavior was not significant, $\beta = 0.078$ (95% CI: -0.020, 0.17), $t(992) = 1.57$, $p = 0.12$. Focusing instead on the simple effects of trust in scientists, at relatively high levels of knowledge (1 *SD* above the mean), greater trust in scientists was significantly associated with greater social distancing, $\beta = 0.31$ (95% CI: 0.21, 0.42), $t(992) = 5.75$, $p < 0.001$, whereas this was greatly attenuated at relatively low levels of knowledge (1 *SD* below the mean), $\beta = 0.11$ (95% CI: -0.037, 0.26), $t(992) = 1.48$, $p = 0.14$ (see Figure 2).[3]

[Figure 2 should be inserted here]

4.1 Additional Exploratory Analyses

The analyses reported above clarify the antecedents and consequences of COVID-19 knowledge. However, our measure of knowledge consisted of two components: true and false statements. Obtaining high scores on the knowledge assessment, then, required that people

[3] The results remain substantively the same when statistically controlling for age and sex in these analyses. See the Supplemental Material for more information.

endorse the correct information contained in the true statements and reject the misinformation contained in the false statements. Given that—relative to correct information—misinformation tends to differ in its origin (i.e., the source), characteristics (e.g., more sensational) and psychological underpinnings (Gilbert, 1991), we thought it informative to conduct a series of additional analyses to detect any different relations with our other variables of interest. First, we found the expected significant correlation between endorsement of the true statements and rejection of the false statements: the more correct information people endorsed, the more misinformation they rejected, $r(996) = 0.52$, 95% CI [0.46, 0.58], $p < 0.001$.

Next, we regressed the number of true statements endorsed on trust in former President Trump and trust in scientists simultaneously. Interestingly, trust in Trump did not account for significant unique variance in endorsement of correct information, $\beta = -0.050$ (95% CI: -0.11, 0.010), $t(992) = -1.45$, $p = 0.15$. In contrast, greater trust in scientists predicted greater endorsement of correct information, $\beta = 0.43$ (95% CI: 0.36, 0.51), $t(992) = 12.52$, $p < 0.001$. We then ran a similar simultaneous regression model predicting the number of false statements rejected. Greater trust in former President Trump predicted *less* rejection of misinformation, $\beta = -0.22$ (95% CI: -0.27, -0.16), $t(992) = -7.48$, $p < 0.001$, whereas greater trust in scientists predicted *greater* rejection of misinformation, $\beta = 0.52$ (95% CI: 0.46, 0.58), $t(992) = 17.77$, $p < 0.001$.

We next examined social distancing behavior, testing the interactions between (1) endorsement of correct information and (2) rejection of misinformation with each of the two trust variables. In addition to the main effects of trust in Trump and trust in scientists noted earlier, the model revealed a main effect of endorsement of correct information, $\beta = 0.22$ (95% CI: 0.13, 0.32), $t(992) = 4.82$, $p < 0.001$. Most importantly, whereas the interaction between endorsement

of correct information and trust in former President Trump was not statistically significant, β = -0.0087 (95% CI: -0.087, 0.069), $t(992) = -0.22$, $p = 0.83$, the interaction with trust in scientists was significant, $\beta = 0.15$ (95% CI: 0.063, 0.25), $t(992) = 3.33$, $p < 0.001$ (see Figure 3). The interaction and simple effects paralleled what we observed for the global measure of COVID knowledge (see SM for details).

[Figure 3 should be inserted here]

Lastly, we regressed social distancing on trust in former President Trump, trust in scientists, rejection of misinformation, and the interactions between rejection of misinformation and each trust variable. Here, the results revealed a significant main effect of rejection of misinformation, $\beta = 0.12$ (95% CI: 0.019, 0.22), $t(992) = 2.33$, $p = 0.020$, a non-significant interaction between rejection of misinformation and trust in scientists, $\beta = 0.072$ (95% CI: -0.026, 0.17), $t(992) = 1.44$, $p = 0.15$, and a significant interaction between rejection of misinformation and trust in Trump, $\beta = -0.12$ (95% CI: -0.21, -0.034), $t(992) = -2.71$, $p = 0.007$ (see Figure 4). Again, the interaction and simple effects paralleled what we observed for the global measure of COVID knowledge (see SM).

[Figure 4 should be inserted here]

5. Discussion

Consistent with our theoretical model, COVID-19 knowledge and trust in authority figures have a complex relation in predicting social distancing. First, trust in prominent authority

figures is linked to acquisition of factual information: lower trust in former President Trump's ability to handle the COVID-19 crisis and greater trust in scientists predicted greater COVID-19 knowledge. To assess the relative contributions of correct information and misinformation, we decomposed the COVID-19 knowledge measure into these two constituent elements. Interestingly, whereas trust in scientists predicted both endorsement of correct information and rejection of misinformation, trust in Trump only related to misinformation acceptance/rejection. That is, people's trust in former President Trump did not predict their endorsement of correct information, but it did relate positively to their acceptance of misinformation. These findings suggest that when it comes to the acquisition of accurate knowledge, trusting scientists steers people toward correct information and away from misinformation, whereas trusting authority figures that promote misinformation (namely, former President Trump) specifically influences people's relationship with misinformation.

The data also indicate that accurate COVID-19 knowledge predicts the degree to which people engage in social distancing: the more knowledgeable they are, the greater distance the place between themselves and others. Perhaps the most important contribution of this work, however, is revealing the interactive effect of knowledge and trust. First, the knowledge-distancing relation was moderated by trust in Trump, such that among those reporting low levels of trust, greater knowledge was associated with greater distancing. Among those reporting high levels of trust in Trump, that relation was significantly attenuated. Moreover, the influence of COVID-19 knowledge on social distancing was also moderated by people's trust in scientists. Among those with high trust in scientists, COVID-19 knowledge predicted greater distancing. In contrast, among those low in trust in scientists, that relation was null. The moderating effect of trust in scientists on the relation between accurate COVID-19 knowledge and social distancing

appears to be largely driven by its interaction with endorsement of correct information. Thus, in addition to being linked to the endorsement of correct information, trusting scientists also appears to validate those who have relatively greater levels of correct information, resulting in the greatest levels of social distancing. On the other hand, the moderating effect of trust in former President Trump appears to be largely driven by its interaction with rejection of misinformation. Trust in former President Trump, then, is linked to less rejection of misinformation, and also attenuates the influence that greater rejection of misinformation has on social distancing.

For some readers, the interactions between trust and knowledge reported here may appear contrary to other findings in the literature. For example, the attitude change literature suggests that when people receive persuasive messages, those low in knowledge about an issue base their opinion on peripheral cues—such as characteristics of the source (Petty & Wegener, 1998; Wood & Kallgren, 1988). Based on this work, one might hypothesize that the largest effects of trust should be found among those low in knowledge, which is not consistent with our data.

However, other research provides evidence of greater polarization among individuals high in knowledge. For example, Drummond and Fischoff (2017) found the widest political and religious gaps in beliefs on controversial science-related issues (e.g., the big bang theory) among those who had greater scientific literacy and more education. The apparent discrepancy may be a function of the focus of the research. The work on persuasion suggests that attitudes change most among those low in knowledge following a message delivered by a likeable source (a relative change). However, absent a persuasion attempt, those high in knowledge appear to be characterized by more polarized attitudes on these issues (their absolute standing). Given that the current research focused on assessing absolute standing (rather than relative changes in response

to a message) with regard to social distancing, its consistency with the work of Drummond and Fischoff is quite sensible.

Importantly, our results have implications for campaigns aimed at increasing compliance with social-distancing directives. First, they suggest that efforts to promote greater trust in scientists may prove beneficial both by improving the public's knowledge about the central issue and by validating this knowledge. The more people trust in scientists, the more they should be exposed to authoritative sources—and once they acquire the information, the more likely they should be to act on it. Our results also speak to the importance of battling misinformation as greater trust in former President Trump —a consistent purveyor of misinformation (Paz, 2020)—both predicted poorer COVID-19 knowledge and dampened the effect of knowledge on behavior.

Returning to the question posed in the introduction, when people know better, do they do better? Our findings suggest this is not necessarily the case. Consequently, any campaign aimed at increasing compliance with social-distancing directives should employ a multi-pronged approach. Currently, health agencies in the United States have launched initiatives to promote social distancing that largely focus on providing information to the public. For example, the Centers for Disease Control and Prevention have created public service announcements and social media kits to provide information about the symptoms and prevention of COVID-19 (Centers for Disease Control and Prevention, 2020a), and the front page of their COVID-19 website prominently features a section titled "Get the Facts about Coronavirus" (Centers for Disease Control and Prevention, 2020b). At the state level, Oregon—among others—launched a campaign that, in addition to connecting citizens with resources, focused on delivering information about the transmission and symptoms of the virus (State of Oregon, 2020). However,

previous research suggests that providing corrective information may have no effect or even backfire (Nyhan & Reifler, 2015). Our results suggest that these campaigns can be optimized by not only providing accurate information, but also prominently featuring material that promotes the value of science and employing strategies that encourage the rejection of misinformation (Fazio, 2020). More broadly, this study's findings may inform future campaigns aimed at improving compliance with scientific guidelines, whether they be the result of a future crisis or an attempt to promote a healthier lifestyle.

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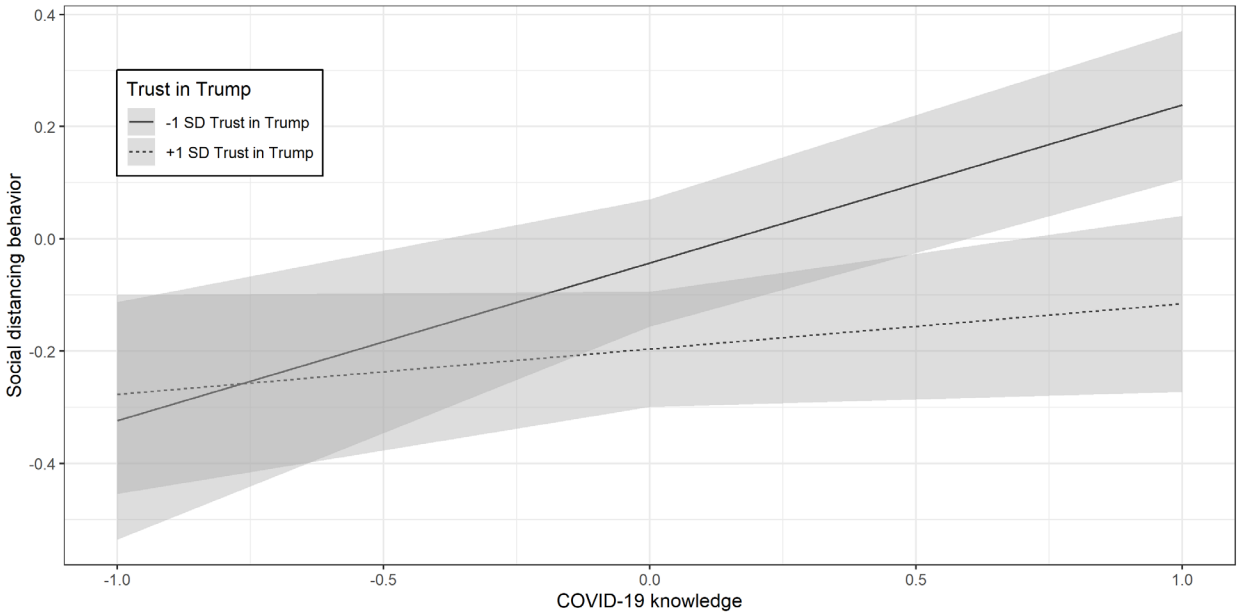
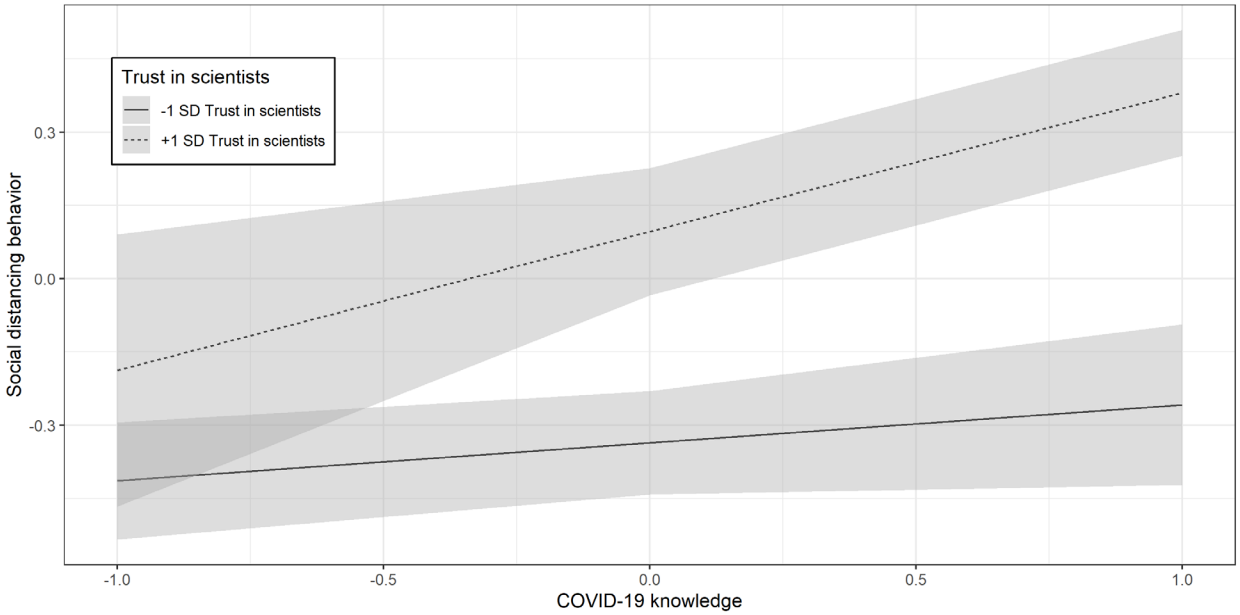
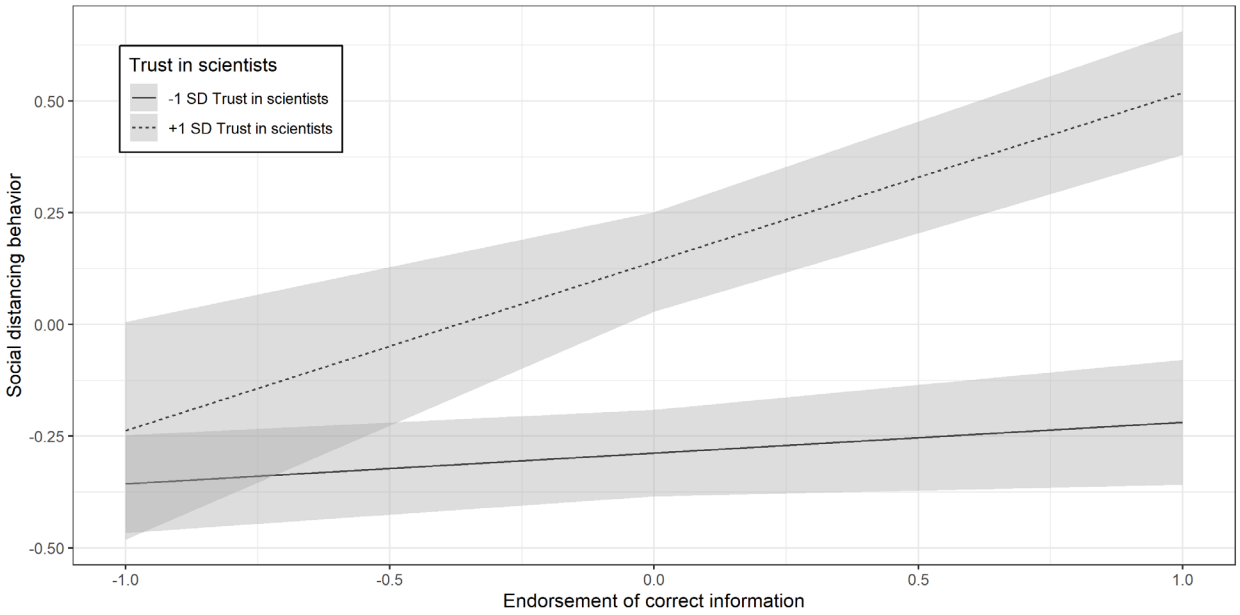

Trust in Trump
-1 SD Trust in Trump
+1 SD Trust in Trump
Social distancing behavior
0.4
0.2
0.0
-0.2
-0.4
-1.0
-0.5
0.0
0.5
1.0
COVID-19 knowledge


Trust in scientists
-1 SD Trust in scientists
+1 SD Trust in scientists
Social distancing behavior
0.3
0.0
-0.3
-1.0
-0.5
0.0
0.5
1.0
COVID-19 knowledge


Trust in scientists
-1 SD Trust in scientists
+1 SD Trust in scientists
Social distancing behavior
0.50
0.25
0.00
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-0.50
-1.0
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0.0
0.5
1.0
Endorsement of correct information

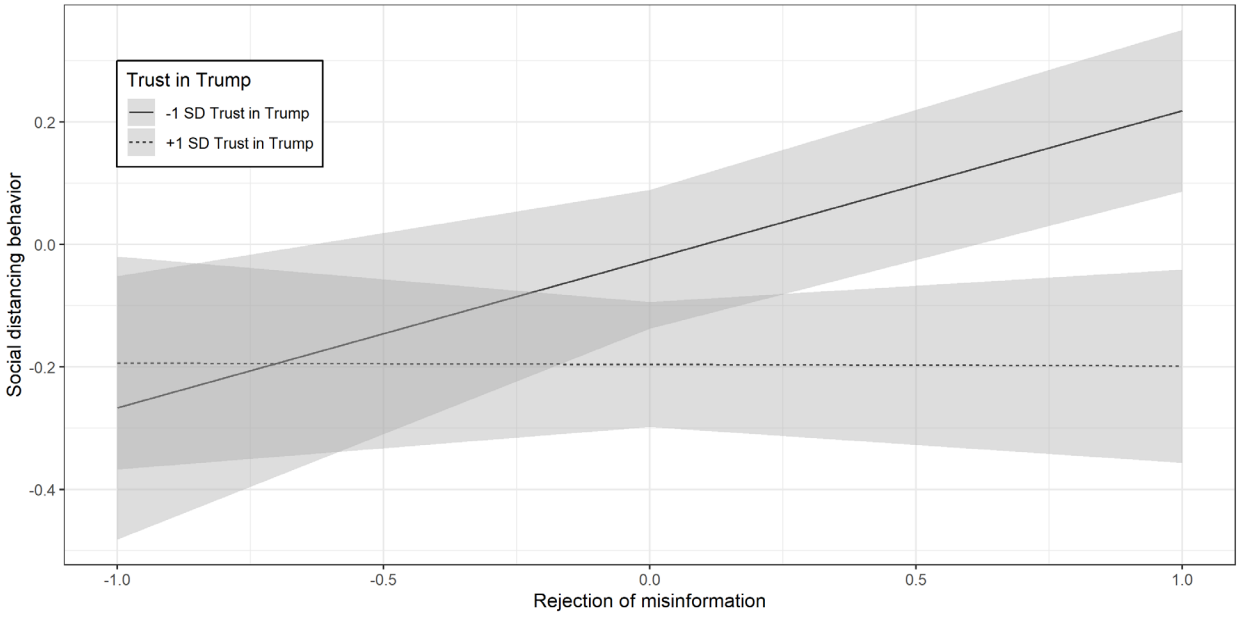
Trust in Trump
-1 SD Trust in Trump
+1 SD Trust in Trump
Social distancing behavior
0.2
0.0
-0.2
-0.4
-1.0
-0.5
0.0
0.5
1.0
Rejection of misinformation

Figure 1. Social distancing by COVID-19 knowledge scores, trust in former President Trump, and their interaction, adjusting for trust in scientists and the interaction between knowledge and trust in scientists. Higher numbers indicate greater distancing.

Figure 2. Social distancing by COVID-19 knowledge, trust in scientists, and their interaction, adjusting for trust in Trump and the interaction between knowledge and trust in Trump. Higher numbers indicate greater distancing.

Figure 3. Social distancing by endorsement of correct information, trust in scientists, and their interaction, controlling for trust in Trump and the interaction between correct information endorsement and trust in Trump. Higher numbers indicate greater distancing.

Figure 4. Social distancing by rejection of misinformation, trust in Trump, and their interaction, controlling for trust in scientists and the interaction between misinformation-rejection and trust in scientists. Higher numbers indicate greater distancing.