Beliefs about COVID-19 in Canada, the U.K., and the U.S.A.: A novel test of political polarization and motivated reasoning

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Abstract

What are the psychological consequences of the increasingly politicized nature of the COVID-19 pandemic in the United States relative to similar Western countries? In a two-wave study completed early (March) and later (December) in the pandemic, we found that polarization was greater in the U.S. (N=1,339) than in Canada (N=644) and the U.K. (N=1,283). Political conservatism in the U.S. was strongly associated with engaging in weaker mitigation behaviors, lower COVID-19 risk perceptions, greater misperceptions, and stronger vaccination hesitancy. Although there was some evidence that cognitive sophistication was associated with increased polarization in the U.S. in December (but not March), cognitive sophistication was nonetheless consistently negatively correlated with misperceptions and vaccination hesitancy across time, countries, and party lines. Furthermore, COVID-19 skepticism in the U.S. was strongly correlated with distrust in liberal-leaning mainstream news outlets and trust in conservative-leaning news outlets, suggesting that polarization may be driven by differences in information environments.

Key words: COVID-19; motivated reasoning; political polarization; cognitive reflection; attitudes
Introduction

As the SARS-CoV-2 virus has spread across the globe, concern about the virus has increased as well. For example, Gallup estimated that in early-to-mid February only 36% of United States residents were somewhat or very worried about being exposed to the novel coronavirus, but this number rose to 60% by early-to-mid March (Newport, 2020) and has remained consistently high until the end of 2020 (Gallup, 2020). Nonetheless, there have been numerous news reports indicating that many people have not been taking the COVID-19 disease seriously in, for example, the United States (Jacobo, 2020; Schnell, 2020), the United Kingdom (BBC, 2020; Dalton, 2020), and Canada (Bryden, 2020; Hensley, 2020). Furthermore, there is evidence that misinformation about COVID-19 has proliferated on social media (Frenkel et al., 2020; Russonello, 2020), suggesting that belief in harmful misperceptions may be contributing to this problem (Enders et al., 2020). There is also concern that misinformation may hurt effort to vaccinate the public and therefore extend or undermine the effort to eradicate the disease (Beckett, 2021; Bridge & Roumeliotis, 2020; Levine, 2020).

Given that having even a vaguely accurate understanding of the risk posed by COVID-19 is presumably a central first step toward mobilizing the behavior changes necessary to save lives, it is therefore important to understand why people differ in their opinions about COVID-19. Furthermore, COVID-19 presents a unique opportunity to test psychological theories about political polarization and science beliefs in the context of a novel test case.

Political partisanship

One of the most salient apparent sources of disagreement surrounding COVID-19 is political partisanship. In the United States, President Donald Trump has vacillated on the level of threat that the nation is facing. Although Trump declared a state of emergency on March 13th, he has been notably skeptical about the risk posed by the virus. For example, he said that the country is “in very good shape” on February 14th (Politifact & Greenberg, 2020), likened it to the common flu on March 9th (Montanaro, 2020), and, on March 24th when it was clear that the virus has spread throughout the country, he nonetheless proposed that the U.S. be “reopened” by Easter (Ballhaus et al., 2020) (a proposal he later backtracked on; (Sink et al., 2020). Similar messaging has come from other elite Republicans and conservative media outlets such as Fox News (Costa, 2020; Grynbaum & Abrams, 2020). Consistent with this messaging, a Pew poll from early-to-mid March estimated that most (59%) Democrats viewed COVID-19 to be a major threat to the health of the U.S. population whereas only a minority (33%) of Republicans agreed. There is also evidence that physical distancing was less frequent among younger adults who are Republican relative to Democratic (Leventhal et al., 2020) and there are anecdotal reports Trump supports who do not believe that COVID-19 is “real” despite contracting the disease (Falzone, 2020).

Interestingly, COVID-19 represents a sort of natural experiment: An identical crisis (in form) is being faced by other culturally similar countries, but without the seemingly extreme politicization that has occurred in the U.S. For example, although there have been disagreement about the effectiveness and quality of Prime Minister Boris Johnson’s response to the pandemic in the United Kingdom (Crace, 2020), Johnson has nonetheless primarily deferred to experts (Harris, 2020). This stands in stark contrast to Trump, who has frequently contradicted even his own experts (Sink & Parker, 2020).
A more ambiguous comparison to the polarization in the U.S. comes from Canada. Prime Minister Justin Trudeau has not faced the same level of criticism as Trump (with some exceptions; Chase, 2020) – in fact, it has been argued that Trudeau’s response has been better than Trump’s (Ibbitson, 2020; Maher, 2020). Furthermore, an early study of Twitter behavior from Canadian Member’s of Parliament found no evidence that members from any party were downplaying the pandemic (Merkley et al., 2020). However, so-called “culture wars” in the U.S. tend to spill over into Canadian politics and there is evidence that political ideology (although not political party membership) correlates with perceptions of COVID-19 severity in Canada (with conservatives viewing it as less severe; Merkley et al., 2020).

These apparent cross-country differences allow us to test whether political ideology per se (i.e., across countries) is associated with beliefs about COVID-19 (and, notably, rejection or skepticism of it) or whether this is relatively unique to the polarized political environment of the United States.

Cognitive Sophistication
In addition to being a matter of public health and policy, COVID-19 is a scientific issue. Relevant experts and organizations such as the World Health Organization and American Center for Disease Control have warned extensively about the substantial risks to public health posed by COVID-19. Furthermore, many of the misperceptions about COVID-19 are similar to common misconceptions about science (and, in particular, medical science); for instance, that simple remedies (e.g., Vitamin C) are sufficient to cure diseases. Interestingly, the politicization of COVID-19 (at least in the U.S.) also brings it in parallel with other scientific topics. For example, there are striking parallels between messaging from President Trump (and others) in the U.S. around COVID-19 and the history of climate change skepticism – where some contrarians have moved from denying global warming entirely to arguing that the solutions are (instead) too costly (Edelman, 2020). Thus, we also draw on research that focuses on science-related beliefs to better understand misperceptions about COVID-19.

Given the salience of politically divisive topics like climate change, it is perhaps unsurprising that research on why people believe what they believe about science has focused on the role of political ideology (Gauchat, 2012; Kahan, 2013; Kahan et al., 2012; Linden, Leiserowitz, & Maibach, 2017; McCright, 2011; McCright & Dunlap, 2011; Pennycook, Cheyne, Koehler, & Fugelsang, 2019; Rutjens, Sutton, & van der Lee, 2018; Scheufele, 2014). There are a variety of theories that make somewhat different claims in this space, but a common feature is that anti-science beliefs are largely cultural. For example, historical evidence shows that conservative think-tanks actively politicized global warming (undermining scientists and relevant experts) (Brulle, 2013; Dunlap & Jacques, 2013; Jacques et al., 2008); this polluted information environment is then transmitted to the general public and interacts with the ideology of individuals such that political conservatives are motivated to accept anti-science attitudes (e.g., to protect their political identities; Kahan et al., 2012; Kahan et al., 2017).

Again, here, a comparison across countries where the cultural transmission of anti-science messaging seems to be differing (with greater skepticism about COVID-19 in the United States) allows for a novel test of this longstanding perspective. This is important because there has recently been some criticism of the focus on ideology as a causal factor in the context of science beliefs because it is likely that those beliefs about science also proceed
through what might be consider more ‘typical’ information processing routes. For example, early theories about public understanding of science focused on the role of one’s basic science knowledge—referred to as knowledge deficit models. This perspective argues that people hold anti-science beliefs largely because they do not possess enough basic scientific knowledge to properly understand novel science-related claims (Allum et al., 2008; Sturgis & Allum, 2004). The claim that follows is that providing people with basic scientific knowledge will then lead to an increase in acceptance of science. In support of this, some recent research suggests that teaching people about the basic science behind genetically modified foods (McPhetres et al., 2019) and climate change (Ranney & Clark, 2016) can actually lead to positive belief changes. Given that the current threat is a virus, it seems that fundamental biological and scientific knowledge might be especially relevant in assessing and responding to the threat.

Although the knowledge-deficit model has been criticized (Simis et al., 2016), research in other areas has converged on a similar conclusion: Not all reasoning is politically motivated and being more cognitively sophisticated (including, but not limited to, basic scientific knowledge) facilitates the adoption of accurate and pro-scientific beliefs. For example, people who are more reflective and analytic (as opposed to relying more on their intuitions) are more likely to endorse evolution (Gervais, 2015), and vaccination (Sarathchandra et al., 2018) and are less likely to believe in superstitions (Pennycook et al., 2012), conspiracies (Swami et al., 2014), and fake news (Pennycook & Rand, 2019b). Relatedly, people who are more receptive to pseudo-profound bullshit (i.e., they rate random sentences filled with buzzwords as profound) are more likely to believe in the efficacy of non-evidence-based alternative medicines and general conspiracy theories (Pennycook, Cheyne, et al., 2015) as well as fake news (Pennycook & Rand, 2019c). Finally, being able to understand probabilities and numbers (i.e., numeracy; Peters et al., 2006) has been shown to be important for a variety of decisions, but most notably in medical contexts (Lipkus & Peters, 2009). Factors such as basic science knowledge, cognitive reflection, numeracy, and bullshit skepticism represent a set of related but unique cognitive competencies that apparently facilitate the adoption of pro-scientific beliefs. For simplicity, we will collectively refer to them as “cognitive sophistication” here.

Given the conflicting perspectives offered by this past research, it is unclear how cognitive processing will function in the context of COVID-19. In addition to helping to guide COVID-19 interventions, this may also shed light on basic theoretical question of what shapes peoples beliefs about science, particularly as it relates to the relative roles of ideology versus cognitive sophistication (McPhetres & Pennycook, 2020).

Identity-protective cognition

Thus far, we have discussed the roles of cognitive sophistication and political polarization. However, there is another prominent theory that we have yet to address: Identity-protective cognition (Drummond & Fischhoff, 2017; Kahan, Jenkins-Smith, & Braman, 2011; Kahan et al., 2012; Kahan et al., 2017; Landrum, Lull, Akin, Hasell, & Jamieson, 2017). This account proposes that ideology and cognitive sophistication actually interact to predict attitudes about science and misinformation, such that individuals who have the strongest reasoning capacities are the most politically polarized (this is sometimes referred to as “motivated System 2 reasoning”). For example, whereas Democrats who are the most reflective and numerate believe that the risks associated with climate change are greater than those who
are more intuitive and innumerate, the opposite pattern is evident among Republicans (Kahan et al., 2012). That is, the more cognitively sophisticated Republicans are actually less likely to hold beliefs that are consistent with the scientific consensus on climate change (see also: Drummond & Fischhoff, 2017; Kahan, 2013).

This research, however, faces the same criticism as research on the broad role of ideology on science beliefs: It tends to focus on a small number of issues and it is therefore unclear how generalizable it is to other scientific issues. Indeed, recent evidence indicates that there is very little evidence that cognitive sophistication is associated with increased anti-science attitudes, even in cases where such attitudes are politically congenial (McPhetres & Pennycook, 2020; Pennycook et al., 2020). This research shows that, even if cognitive sophistication interacts with ideology when predicting some (but not all or even most) anti-science attitudes, the general pattern is that people who are better at reasoning are usually less likely to hold beliefs counter to scientific consensus. Furthermore, recent work in the context of political misinformation (“fake news”) shows that cognitive sophistication is associated with an increased capacity to discern between true and false content regardless of whether it is consistent or inconsistent with one’s political identity (B. Bago et al., 2019; Pennycook & Rand, 2019b). This is consistent with the work cited above that shows the benefits of cognitive sophistication (and analytic thinking specifically) for accurate belief formation (Pennycook, Fugelsang, et al., 2015).

To summarize, the COVID-19 crisis offers a unique possible test of two competing accounts: Does cognitive sophistication lead to more accurate beliefs overall or is it primarily used to support ideologically motivated reasoning and, therefore, increased political polarization?

Study 1

For Study 1, we investigated these issues using three parallel preregistered surveys using quota-sampling of residents from the U.S. (N = 689) and the U.K. (N = 642), in addition to a convenience sample of residents from Canada (N = 644) – all via the polling firm Prolific (see supplementary materials, Table S1, for full demographic breakdown). The survey is therefore not nationally representative; however, the samples all came from the same source which allows for a relatively clean comparison. The survey was completed on March 24th, 2020. Our data, materials, and preregistration is available on the Open Science Framework: OSF. All non-preregistered analyses are labelled as post-hoc. We report all manipulations, measures, and exclusions in these studies.

Method

Participants

We recruited 750 participants each in Canada, the U.K., and the U.S. via Prolific on March 24th, 2020. The U.K. and U.S. samples were recruited with quota-matching to approximate the national populations (via census data) across age, sex, and ethnicity. Prolific does not offer quota-matching for Canadian samples. In total, 753 (Canada), 765 (U.K.), and 759 (U.S.) entered the survey. However, some participants did not complete the survey (N’s = 5, 11, 17) and some did not indicate residing in the target country (N’s = 2, 1, 1). We also included 3 attention check questions (see OSF for full materials; Berinsky, Margolis, & Sances,
2014). Following our preregistration, we removed participants who failed 2 or more of these (N’s = 104, 111, 52). This left us with final sample sizes of 644 (Canada), 642 (U.K.), and 689 (U.S.). Full demographic breakdowns can be found in Table S1 of the supplementary materials.

Materials and Procedure

Full materials and a copy of the Qualtrics survey file can be found on the OSF and descriptive statistics are available in the supplementary materials (Table S2). Measures are listed in order of presentation, unless otherwise stated. At the beginning of the study, participants were told that we had a number of questions about COVID-19, “the novel coronavirus that has recently been declared a global pandemic by the World Health Organization.” We then informed the participants that we will refer to COVID-19 as “coronavirus” throughout the survey for simplicity.

**COVID-19 behavior change intentions.** Participants were asked to rate the extent to which they intended to change their behavior in light of the coronavirus outbreak using a sliding scale from 0 (strongly disagree) to 100 (strongly agree) (Jordan et al., 2020). We first asked 7 questions about stopping the spread through cleanliness (we didn’t mention the term cleanliness) (e.g., “wash my hands more often”, “stop hugging other people”, “try my hardest to avoid touching my face), followed by 5 questions related to sickness (e.g., “stay home if I am feeling even a little bit sick”, “cover my mouth when I cough and sneeze”). We then asked 10 questions about social distancing and, specifically, things that they were intending to avoid (e.g., “going to restaurants”, “going to the grocery store”). This was done on a scale from 0 (I will make no effort to avoid this activity) to 100 (I will completely avoid this activity). We also asked people to indicate which of these 10 activities they would engage in even if there was no coronavirus outbreak (e.g., some people may not go to restaurants regardless of the virus). We did not preregister any re-analysis of the data using this extra question, however. Indeed, the full behavior change intention measure was quite reliable across all three countries: Cronbach’s α = .86 (Canada), .85 (U.K.), and .88 (U.S.). At the very beginning of the study, participants were asked to select “67” on a sliding scale to ensure that their browser/device allowed them to use sliders. We exclude data for the intentions measure for 2 participants from the U.K. and 2 from the U.S. because they failed this check question (those who answered 66 or 68 were also retained, deviating from our preregistration).

**COVID-19 risk perceptions.** We asked 8 questions related to risk perceptions (e.g., “The coronavirus poses a major threat to the public”, “I think the situation with the coronavirus is overblown (reverse scored”)”). The scale had acceptable reliability in all three countries: Cronbach’s α = .73 (Canada), .77 (U.K.), and .83 (U.S.). We also asked three “personal” risk questions as an exploratory measure (e.g., “Because of my age and/or pre-existing conditions, I am likely to have serious symptoms if I were to contract the coronavirus”) – however, we did not preregister any analyses for this measure. Participants responded on a scale from 1 (strongly disagree) to 7 (strongly agree), with 4 (neither agree nor disagree) as the scale midpoint. We also included two exploratory questions about the trade-off between being coronavirus restrictions and the economy (e.g., “The country should *not* be shut down because of the coronavirus – the economic costs are too high”). The risk perception questions were randomized with the misperception questions.
COVID-19 misperceptions. For misperceptions, we created a large list (k = 21) of falsehoods that have been spread about COVID-19 based on various news reports and fact-checking efforts. The misperceptions that we discovered fit broadly into four possible categories (see Table S3 in the supplementary materials), but we will focus on the overall misperception measure for simplicity (it was reliable in all three countries: Cronbach’s α = .80 (Canada), .79 (U.K.), and .84 (U.S.). Although each falsehood was not believed by a particularly large proportion of individuals (with a few exceptions), most participants held at least one misperception (61% in Canada, 69% in the U.K., and 66% in U.S.). A full breakdown of the individual items can be found in supplementary materials (Table S3). The low overall rate of belief in specific misperceptions was paralleled by widespread agreement about the risks posed by COVID-19 (% agreement: 86% in Canada, 87% in the U.K., and 82% in U.S.) and also widespread agreement with behavior change intentions (% agreement: 89% in Canada, 91% in the U.K., and 90% in U.S.). Our samples may under-estimate the proportion of misperceptions which, at any rate, are a moving target and subject to change over time and depending on how questions are worded. For example, a Pew survey from early-to-mid March found that 23% of polled Americans believe that COVID-19 was likely to have been created intentionally in a lab (Schaeffer, 2020) – much higher than the 13% implied here with our “the coronavirus was created in a lab” question (see Table S3).

National leadership. Finally, we asked people 10 questions about how happy they are with the leadership of their respective countries. The questions were identical for the three countries except that the leader was exchanged: Prime Minister Trudeau / Prime Minister Johnson / President Trump. The questions asked about a variety of factors (e.g., “[Leader] is a good source of information regarding the coronavirus”, “[Leader] is doing all he can to prevent further spread of the coronavirus”], etc.). We also asked 4 exploratory questions that relate to nationalism (e.g., “[America] is the most prepared nation with respect to the coronavirus outbreak”). For brevity, we do not report these results here.

Cognitive sophistication. The four cognitive sophistication measures were presented in a random order for each participant. After each of the three tests (i.e., excluding the bullshit receptivity measure), participants were asked to estimate their accuracy.

We assessed science knowledge using 17 true/false question test (McPhetres & Pennycook, 2020; Miller, 2004) with questions like “Electrons are smaller than atoms” and “Antibiotics kill viruses as well as bacteria” (this was the only item with direct relevance for COVID-19). The science knowledge test was sufficiently reliable in each country: Cronbach’s α = .74 (Canada), .74 (U.K.), and .77 (U.S.).

To assess the disposition to engage in analytic and reflective thinking, we used a 6-item Cognitive Reflection Test (Frederick, 2005). The CRT consists of questions that trigger an automatic intuitive answer that is incorrect (e.g., “If you are running a race and pass the person in second place, what place are you in?” – the intuitive answer is 1st place but the correct answer is 2nd place) and therefore requires reflection to override (Pennycook et al., 2016). Our measure consisted of a re-worded version of the original 3 items (Shenhav et al., 2012) and 3 items from a non-numeric CRT (we excluded the ‘hole’ item; Thomson & Oppenheimer, 2016). The CRT was sufficiently reliable in each country: Cronbach’s α = .70 (Canada), .70 (U.K.), and .72 (U.S.).
Numeracy was assessed using 3 items from the Berlin Numeracy Test (Cokely et al., 2012) and 3 items from the Lipkus numeracy scale (Lipkus et al., 2016). The questions all pertained to understanding probabilities that varied in difficulty (e.g., “Imagine we are throwing a five-sided die 50 times. On average, out of these 50 throws how many times would this five-sided die show an odd number (1, 3 or 5)?”). The numeracy test was sufficiently reliable in each country (albeit marginally so in Canada): Cronbach’s α = .65 (Canada), .71 (U.K.), and .73 (U.S.).

Finally, we included a measure of one’s general receptivity to bullshit (Pennycook, Cheyne, et al., 2015). This consisted of 5 sentences that were randomly using a corpus of buzzwords (e.g., “The invisible is beyond new timelessness”) – i.e., pseudo-profound bullshit. Participants rated the profundity of the sentences on a 5-point scale from 1 (not at all profound) to 5 (very profound). This scale was then reverse-scored to put it in-line with the other cognitive sophistication measures. The bullshit receptivity scale, despite using a specific form of bullshit, correlates with a wide range of epistemically suspect beliefs (including belief in fake news; (Pennycook & Rand, 2019c) and therefore appears to measure general receptivity to bullshit.

For simplicity (and following our preregistration), we report the overall results with the omnibus measure of cognitive sophistication. For this, we z-scored each measure and took the mean of the four measures. The reliability of the four measure was similar to the reliabilities for the individual sub-scales in each country (using the 4 means as variables in the analysis): Cronbach’s α = .66 (Canada), .71 (U.K.), and .69 (U.S.). Alternatively, creating a composite measure of cognitive sophistication by simply taking each individual item from the subscales produces higher reliability [Cronbach’s α = .84 (Canada), .85 (U.K.), and .86 (U.S.)] but this does not equally weight the individual sub-scales. Thus, we report results for the omnibus measure that weighs each sub-scale equally.

Trust. As additional exploratory measures (their analyses were not included in the preregistration), we asked the participants to indicate their degree of trust in various information sources using a 5-point scale from “none at all” to “a great deal”. Participants from all countries were first asked about the following sources: Friends and family, Social networking sites (e.g., Facebook, Twitter), Scientists, Medical experts, The Center for Disease Control (note: this was incorrectly given to participants from all 3 countries despite being American-specific), and Medical doctors (e.g., general practitioners). We then asked them to indicate how much they trust various news sources specific to their own country. We created two composite variables based on the correlation between political conservatism (described below) and trust in the various news outlets. Those outlets that conservatives trusted more were coded as “conservative media” (U.S.: Fox News, Breitbart; U.K.: Daily Mail, The Times, The Daily Telegraph, and The Sun; Canada: Rebel Media) and those outlets that liberals trusted more were coded as “liberal media” (U.S.: CNN, MSNBC, New York Times, Washington Post, NPR, CBS News, ABC News, NBC News; U.K.: The Guardian, Channel 4; Canada: Global News, CBC, Toronto Star, Globe and Mail).

Political ideology. Participants in all three countries were then asked two questions about political ideology that were then combined to create our conservatism measure: “On social issues I am: (1) Strongly Liberal, (2) Somewhat Liberal, (3) Moderate, (4) Somewhat Conservative, and (5) Strongly Conservative” and “On economic issues I am: (1) Strongly
Liberal, (2) Somewhat Liberal, (3) Moderate, (4) Somewhat Conservative, and (5) Strongly Conservative”.

In addition to the ideology measure, we also asked several country-specific questions. Participants in each country were asked about which federal party they align with (options changing depending on their country). They were also asked 3 questions about the national leadership in their respective country: 1) a feeling thermometer (0 = extremely unfavorable feeling; 100 = extremely favorable feeling), 2) strength of support or opposition (1 = strongly oppose; 7 = strongly support), and 3) likelihood of voting for the leader in the future (1 = extremely unlikely, 7 = extremely likely).

In the U.S. sample, we also included a continuous political partisanship measure where participants indicated their stance given the following options: Strongly Democratic, Democratic, Lean Democratic, Lean Republican, Republican, Strongly Republican. Notably, this was very highly correlated with political ideology, \( r = .82 \). Nonetheless, as post hoc robustness tests, we will report parallel analyses for partisanship where appropriate.

Demographics. Finally, at the end of the survey we asked a variety of demographic questions. This included age, education, income, gender, and two questions about general health.

Results

Political ideology

To investigate the differential impact of political polarization, we correlated the same measure of political ideology (mean of social and economic liberal-conservatism) with our COVID-19 attitude and behavior measures across the three countries. As is evident from Table 1, political conservatism was associated with misperceptions in all three countries. However, this correlation was stronger in the U.S. than in the U.K. (correlations in Canada and the U.S. did not significantly differ, although the correlation was nominally larger in the U.S.; Table 2). The same pattern held for perceptions of COVID-19 risk and self-reported behavior change intentions: Political conservatives in the U.S. and Canada appear to have been taking COVID-19 less seriously than liberals, but the same pattern was not evident in the U.K. (indeed, ideology did not significantly predict risk perceptions or change intentions in the U.K.). The correlation between ideology and behavior change intentions was smaller, but nonetheless divergent between U.S. and U.K. Ideology was also a stronger predictor of COVID-19 risk perceptions in the U.S. than Canada once demographics (age, gender, income, education, and overall health) were controlled for (see Table S4 in supplementary materials – all other findings were identical with demographics included).
Table 1. Zero-order correlations between primary measures in Canada (N = 644), United Kingdom (N = 642), and United States of America (N = 689).

|          | 1          | 2          | 3          | 4          | 5          | 6          |
|----------|------------|------------|------------|------------|------------|------------|
| Canada   |            |            |            |            |            |            |
| 1. Misperceptions | -         |            |            |            |            |            |
| 2. COVID Risk     | -0.34***  |            |            |            |            |            |
| 3. Change Intentions | -0.26***   | 0.50***    |            |            | -0.17***   |            |
| 4. Conservatism   | 0.27***    | -0.26***   | -0.17***   |            |            |            |
| 5. Conserv. Media Trust | 0.22***   | -0.14***   | -0.08      | 0.17***    |            |            |
| 6. Liberal Media Trust | -0.18***  | 0.13***    | 0.17***    | -0.21***   | 0.09*      |            |
| 7. Cognitive Sophistication | -0.34***  | 0.002      | -0.03      | -0.11**    | -0.08*     | -0.02      |
| U.K.     |            |            |            |            |            |            |
| 1. Misperceptions | -         |            |            |            |            |            |
| 2. COVID Risk     | -0.29***  |            |            |            |            |            |
| 3. Change Intentions | -0.10*    | 0.44***    |            |            |            |            |
| 4. Conservatism   | 0.14**     | -0.02      | 0.07       |            |            |            |
| 5. Conserv. Media Trust | 0.05      | 0.06       | 0.12**     | 0.24***    |            |            |
| 6. Liberal Media Trust | -0.20***  | 0.23***    | 0.15***    | -0.20***   | 0.48***    |            |
| 7. Cognitive Sophistication | -0.40***  | -0.11***   | -0.10*     | -0.19***   | -0.10***   | 0.09*      |
| U.S.     |            |            |            |            |            |            |
| 1. Misperceptions | -         |            |            |            |            |            |
| 2. COVID Risk     | -0.40***  |            |            |            |            |            |
| 3. Change Intentions | -0.20***  | 0.52***    |            |            |            |            |
| 4. Conservatism   | 0.31***    | -0.36***   | -0.15***   |            |            |            |
| 5. Conserv. Media Trust | 0.39***   | -0.26***   | -0.06      | 0.55***    |            |            |
| 6. Liberal Media Trust | -0.21***  | 0.35***    | 0.22***    | -0.45***   | -0.16***   |            |
| 7. Cognitive Sophistication | -0.46***  | 0.04       | -0.05      | -0.17***   | -0.25***   | 0.03       |

*** p < .001, ** p < .01, * p < .05

Table 2. Multiple regression analyses (B and 95% Confident Intervals) comparing the correlation between key DVs and ideology across countries (with USA as a baseline). Conservatism was standardized (z-scored) within country prior to analysis. Canada (N = 644), United Kingdom (N = 642), and United States of America (N = 689).

|                | Misperceptions | COVID Risk  | Change Intentions |
|----------------|---------------|-------------|------------------|
| Conservatism   | 0.31***       | -0.36***    | -0.15***         |
|                | [0.24, 0.38]  | [-0.43, -0.28] | [-0.23, -0.08]   |
| Conservatism:U.K. | -0.17**    | 0.34***     | 0.22***          |
|                | [-0.28, -0.07] | [0.23, 0.44] | [0.11, 0.33]     |
| Conservatism:Canada | -0.05      | 0.10        | -0.02            |
|                | [-0.15, 0.06] | [-0.00, 0.21] | [-0.13, 0.09]    |
| N              | 1975          | 1975        | 1971             |
| R2             | 0.06          | 0.07        | 0.02             |
Notably, a post-hoc analysis found that trust in conservative news outlets in the U.S. and Canada (but not the U.K.) correlated significantly with higher misperceptions and weaker COVID risk perceptions (see Table 1). Trust in liberal news outlets in all three countries was associated with fewer misperceptions and higher COVID risk perceptions, suggesting that a potential source of polarization is specifically contrasting narratives in right-wing versus mainstream (“liberal-leaning”) media coverage in the U.S. and Canada. In fact, when liberal and conservative media trust are entered into a multiple regression analysis with conservatism in the U.S. sample, the former are significant predictors of misperceptions (liberal media trust: $\beta = -.13, p = .001$; conservative media trust: $\beta = .34, p < .001$) and political conservatism is no longer predictive ($\beta = .07, p = .143$). It should be noted, that the outlets in the “liberal” category, such as the New York Times and Washington Post in the U.S. and BBC and the Guardian in the U.K., tend to be higher quality (Pennycook & Rand, 2019a). Thus, although causality cannot be determined with our cross-sectional design, differential exposure to low-versus-high quality content relating to COVID-19 appears to be a source of political polarization.

Cognitive sophistication

To test whether cognitive sophistication is also a strong and consistent predictor of beliefs – and, in particular, misperceptions – we also had our participants complete a battery of tests consisting of a 17-item basic science knowledge test (McPhetres & Pennycook, 2020; Miller, 2004), a 6-item Cognitive Reflection Test (Frederick, 2005) as a measure of analytic (versus intuitive) thinking, a 5-item Bullshit Receptivity test (Pennycook, Chyne, et al., 2015), and a 6-item numeracy test (Cokely et al., 2012; Lipkus et al., 2016). We present the correlations between our outcomes and the constituent measures of cognitive sophistication in the supplementary materials (Table S5).

As is evident from Table 1, overall cognitive sophistication (the composite of the 4 measures, equally weighted) was a strong negative predictor of COVID-19 misperceptions ($r$’s = -.34, -.40, -.46 in Canada, the U.K., and the U.S., respectively). In a post-hoc comparison of effect sizes using an $r$-to-$z$ transformation, cognitive sophistication more strongly predicted misperceptions than did ideology for the U.S., $z = 3.44, p < .001$ – and U.K. samples, $z = 5.50, p < .001$ (this was only marginally significant in the Canadian sample, $z = 1.63, p = .052$). Interestingly, cognitive sophistication was not a strong or consistent predictor of COVID-19 risk perceptions or behavior change intentions (Table 1). Thus, even though individuals who are better at reasoning are less likely to believe falsehoods surrounding COVID-19 (which itself correlated with other COVID-19 attitudes), the factors that determine how seriously they are taking the crisis (beyond ideology) are more uncertain (see also Erceg et al., 2020; Stanley et al., 2020).

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1 Collinearity does not appear to be a problem here, VIF for conservatism = 1.78. The parallel analysis using political partisanship produces the same result: liberal media trust: $\beta = -.13, p = .002$, conservative media trust: $\beta = .35, p < .001$, Republican partisanship: $\beta = .05, p = .288$.
2 The parallel analysis comparing cognitive sophistication and political partisanship in the U.S. produced the same result (the former being a stronger predictor of misperceptions than the latter): $z = 3.29, p < .001$.
Table 3. Multiple regression analyses (B and 95% Confident Intervals) interacting political conservatism and cognitive sophistication in the prediction of our key dependent variables. Conservatism and cognitive sophistication were standardized (z-scored) within country prior to analysis.

**Canada**

|                     | Misperceptions | COVID Risk | Behavior Changes | Leadership |
|---------------------|----------------|------------|------------------|------------|
| Conservatism        | 0.23***        | -0.26***   | -0.18***         | -0.35***   |
|                     | [0.16, 0.30]   | [-0.33, -0.18] | [-0.25, -0.10] | [-0.42, -0.28] |
| Cognitive Sophistication | -0.31***   | -0.03      | -0.05            | -0.03      |
|                     | [-0.38, -0.24] | [-0.10, 0.05] | [-0.13, 0.03]   | [-0.10, 0.05] |
| Conservism:CogSoph  | < 0.01        | < 0.01     | < 0.01           | 0.01       |
|                     | [-0.07, 0.08]  | [-0.08, 0.07] | [-0.08, 0.07]   | [-0.06, 0.08] |
| N                   | 644           | 644        | 644              | 644        |
| R2                  | 0.17          | 0.07       | 0.03             | 0.12       |

**UK**

|                     | Misperceptions | COVID Risk | Behavior Changes | Leadership |
|---------------------|----------------|------------|------------------|------------|
| Conservatism        | 0.06           | -0.04      | 0.06             | 0.44***    |
|                     | [-0.01, 0.14]  | [-0.12, 0.04] | [-0.02, 0.14]   | [0.37, 0.51] |
| Cognitive Sophistication | -0.39***   | -0.11**    | -0.09*           | 0.02       |
|                     | [-0.47, -0.32] | [-0.19, -0.03] | [-0.17, -0.01] | [-0.05, 0.10] |
| Conservism:CogSoph  | -0.04          | < 0.01     | -0.07            | 0.02       |
|                     | [-0.12, 0.04]  | [-0.08, 0.09] | [-0.15, 0.01]   | [-0.06, 0.09] |
| N                   | 642           | 642        | 640              | 642        |
| R2                  | 0.17          | 0.01       | 0.02             | 0.19       |

**USA**

|                     | Misperceptions | COVID Risk | Behavior Changes | Leadership |
|---------------------|----------------|------------|------------------|------------|
| Conservatism        | 0.24***        | -0.36***   | -0.17***         | 0.68***    |
|                     | [0.17, 0.30]   | [-0.43, -0.29] | [-0.24, -0.09] | [0.62, 0.73] |
| Cognitive Sophistication | -0.42***   | -0.02      | -0.07            | -0.02      |
|                     | [-0.48, -0.35] | [-0.09, 0.05] | [-0.15, 0.00]   | [-0.08, 0.03] |
| Conservism:CogSoph  | 0.02           | -0.06      | -0.05            | 0.02       |
|                     | [-0.05, 0.08]  | [-0.13, 0.01] | [-0.12, 0.03]   | [-0.04, 0.08] |
| N                   | 689           | 689        | 687              | 689        |
| R2                  | 0.27          | 0.13       | 0.03             | 0.46       |

*** p < 0.001; ** p < 0.01; * p < 0.05.
Identity-protective cognition

Next, we examined whether cognitive sophistication leads to more accurate beliefs overall, or whether it is primarily used to support motivated reasoning (thereby increasing political polarization). To test this, we interacted ideology and cognitive sophistication separately for our four dependent variables in the three samples (see Table 3). Although political ideology was a predictor of COVID-19 beliefs and misperceptions in Canada and the U.S. (as described above), we found no evidence whatsoever for an interaction between ideology and cognitive sophistication for any measure in any country (all $\beta$’s < .06). The result is clear: Cognitive sophistication is associated with decreased misperceptions about COVID-19 for liberals and conservatives alike (and to the same degree) in all three countries – and is unrelated to risk perceptions and prevention behavior intentions regardless of ideology. We repeated this analysis using our continuous political partisanship measure in the U.S. sample and it produced the same null interactions (all $\beta$’s < .04, $p$’s > .340). We found no evidence that cognitive sophistication exacerbates ideological or partisan differences in the context of COVID-19 beliefs and attitudes. Post-hoc tests also revealed that neither liberal ($\beta = -.03, p = .318$) or conservative ($\beta = -.01, p = .712$) media trust significantly interacted with cognitive sophistication when predicting misperceptions in the U.S.

Study 2

Study 1 found that, even in the relatively early days of the COVID-19 pandemic in the global west, political polarization was greater in the U.S. than in the U.K and (less robustly) Canada. Despite this polarization, however, we found no evidence that cognitive sophistication was associated with stronger political polarization – contrary to the identity-protective cognition account. Indeed, cognitive sophistication was a better predictor of misperceptions than was political ideology in all three countries. There are, however, two major criticisms of these data. First, since the study was completed at the end of March, it can be argued that sufficient time had not yet passed for political polarization to take a strong hold and impact people’s thinking. Second, our measure of political ideology did not directly assess how much people identify with partisan groups, and thus could be considered a relatively weak proxy for political motivation. Therefore, we ran an updated version of the study, also preregistered, using the same Prolific quota-sampling in the U.S. (N = 697) and the U.K. (N = 641) on December 9th-15th, 2020.3 Our data, materials, and preregistration is available on the OSF. All non-preregistered analyses are labelled as post-hoc.

Method

Participants

We recruited 750 participants in the U.K. and the U.S. via Prolific on December 9th and 15th, 2020. The samples were recruited with quota-matching to approximate the national populations (via census data) across age, sex, and ethnicity. In total, 771 (U.K.), and 783 (U.S.) entered the survey. However, some participants did not complete the survey (N’s = 19, 21) and

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3 Both samples were launched on December 9th; however, a glitch in the Prolific website paused the U.K. sample after ~160 individuals completed the survey and the problem was not fixed until December 14th, at which time we simply re-ran the entire batch from the U.K. starting on the 15th (this was necessary to maintain the quota-sampling).
some did not indicate residing in the target country (N’s = 1, 1). As in Study 1, we also included 3 attention check questions. Following our preregistration, we removed participants who failed 2 or more of these (N’s = 108, 61). This left us with final sample sizes of 641 (U.K.) and 697 (U.S.). Full demographic breakdowns can be found in Table S1 of the supplementary materials.

**Materials and Procedure**

Full materials and a copy of the Qualtrics survey file can be found on the OSF and descriptive statistics are available in the supplementary materials (Table S6). Measures were identical to Study 1, unless otherwise specified.

**COVID-19 mitigation behaviors.** Given that the survey was run 10 months into the U.S./U.K. pandemic, the relevant behavior intentions were less about behavior change intentions and more about maintenance of mitigation behaviors. In any case, these questions were administered in the same way as in Study 1 except that we updated them based on newer recommendations and asked about their mere intentions to engage in the behaviors (as opposed to increase behaviors, as in Study 1). Specifically, we asked about mask wearing, limiting visits with friends and family, hand washing, avoiding public spaces that are indoors, staying home if they feel sick, and getting tested for COVID-19 if they feel sick. We also asked 10 questions about social distancing and avoiding specific public places (e.g., going to bars, restaurants, the gym, and avoiding airports, socializing in small gatherings, etc.). At the very beginning of the study, participants were asked to select “67” on a sliding scale to ensure that their browser/device allowed them to use sliders. We exclude data for the intentions measure for 1 participant from the U.K. and 6 from the U.S. because they failed this check question (1 who put 66 was retained). The full behavior change intention measure was reliable across both countries: Cronbach’s α = .90 (U.K.), and .92 (U.S.).

**COVID-19 vaccination intentions.** We added the following question: “If the federally approved COVID-19 vaccination was available to you for free, would you get vaccinated?” with the following response options: Definitely not get it, Probably not get it, Unsure, Probably get it, Definitely get it. We also asked several exploratory questions about both COVID-19 and seasonal flu vaccines, as well as questions about past history with COVID-19 (e.g., whether they’ve contracted it). We will focus on the COVID-19 vaccination intention question for the present investigation.

**COVID-19 risk perceptions.** We decreased our number of risk items from 8 to 4 (all worded such that a higher score indicates lower risk – we reverse scored the measure for ease of interpretation). The scale had acceptable reliability in both countries: Cronbach’s α = .82 (U.K.), and .89 (U.S.). We also asked two “personal” risk questions, as in Study 1.

**COVID-19 misperceptions.** For misperceptions, we cut the list to 12 items that were particularly salient at the time the study was run (see Table S7). We will again focus on the overall misperception measure (it was reliable in both countries: Cronbach’s α = .82 (U.K.), and .91 (U.S.). We also added two broad misperception-like questions about whether COVID-19 is a hoax and if it has been overblown by the media. Our preregistration stated that if these correlated > .80 with the overall misperception measure, they would be added to the scale. However, they were not (r’s < .71). Unlike in Study 1, a majority (57% in both countries) of our participants did not hold a single misperception (although note that we asked fewer questions in this case).
National leadership. Finally, we asked people 4 questions about how happy they are with the leadership of their respective countries (relating specifically to COVID-19). For brevity, we do not report these results here.

Cognitive sophistication. We used the same cognitive sophistication measures as in Study 1, except the science knowledge test was shortened to 8 items. Each scale had roughly acceptable reliability in both countries. CRT: Cronbach’s α = .69 (U.K.), and .74 (U.S.); Numeracy: Cronbach’s α = .66 (U.K.), and .71 (U.S.); BSR: Cronbach’s α = .87 (U.K.), and .89 (U.S.); Science knowledge: Cronbach’s α = .67 (U.K.), and .68 (U.S.). As in Study 1, we report the overall results with the omnibus measure of cognitive sophistication. The reliability of the four measure was similar to the reliabilities for the individual sub-scales in each country (weighing each sub-scale equally): Cronbach’s α = .69 (U.K.), and .67 (U.S.).

Trust. As in Study 1, we asked the participants to indicate their degree of trust in various information sources using a 5-point scale from “none at all” to “a great deal”. Unlike in Study 1, we preregistered an analysis using the media trust questions. In particular, we first correlated political conservatism (described below) with trust in the various news outlets and then created two composite measures based on the pattern of correlations. Those outlets that conservatives trusted more were coded as “conservative media” (U.S.: Fox News, Breitbart, Newsmax, One American News; U.K.: Daily Mail, The Times, The Daily Telegraph, and The Sun) and those outlets that liberals trusted more were coded as “liberal media” (U.S.: CNN, MSNBC, New York Times, Washington Post, NPR, CBS News, ABC News, NBC News; U.K.: BBC, The Guardian, Channel 4). There were three outlets that did not correlate with ideology in the U.K. sample (Metro, Sky News, ITV News) and they were not included in our analyses. All four measures had good reliability: Cronbach’s α = .96 (liberal media, U.S.), .83 (liberal media, U.K.), .87 (conservative media, U.S.), .82 (conservative media, U.K.).

Political ideology and partisan identification. Our ideology measures were the same as in Study 1, with a few exceptions. First, we revised the ideology question so that it said “left/liberal” and “right/conservative” to clarify the nature of the question. Second, we asked participants in the U.S. about who they voted for in the 2020 election (and what method they used). This is an exploratory measure. Second, and more importantly, we included a partisan identification measure (Leach et al., 2008). The scale included 14 questions, such as “I feel solidarity with [selected Political Party]”, “I am similar to the average member of the [selected Political Party]”. Given that there are multiple political parties in the U.K. and that this measure was included to more directly test the identity-protective cognition account (which makes a stronger prediction in the U.S. than U.K.), we preregistered that we would focus our partisan identification measure on American individuals who identify with the Democratic or Republican parties. We asked individuals who initially identified as “Independent” to determine if they “Lean Democrat”, “Lean Republican” or are “True Independents” – those who leaned in one direction were included in the larger set of Democrats/Republicans for the analysis. Finally, we removed a constant of 8 for Democrats to reverse score the mean. We then added a constant of 7 for Republicans so that the full scale mean would vary continuously from 1 (indicating strongest identification with the Democratic Party) to 14 (indicating strongest identification with the Republican Party). The scale had high reliability across party lines: Cronbach’s α = .95 (Democrats), and .97 (Republicans).

Demographics. We asked the same demographic questions as in Study 1.
Results

Political ideology

To investigate the differential impact of political polarization, we correlated the same measure of political ideology (mean of social and economic liberal-conservatism) with our COVID-19 belief and behavior measures across both countries. As is evident from Table 4, political conservatism was associated with misperceptions in both countries. However, this correlation was over twice as strong in the U.S. than in the U.K. (Table 5). The same pattern held for perceptions of COVID-19 risk, vaccination intentions, and self-reported behavior behavioral intentions (e.g., mask wearing, social distancing): Political conservatives in the U.S. appear to have been taking COVID-19 much less seriously, but the same pattern was not as evident in the U.K. (indeed, ideology does not significantly predict vaccination and behavioral intentions in the U.K.). Ideology was also a stronger predictor of COVID-19 risk perceptions in the U.S. than the U.K. once demographics (age, gender, income, education, and overall health) were controlled for (see Table S8 in supplementary materials – all other findings were identical with demographics included). The party identification measure had similar correlations as political ideology in the U.S. sample.

Interestingly, as in Study 1, there was a divergence between the countries in terms of trust in the news media. In both countries, trust in liberal media outlets was association with lower misperceptions, stronger intentions to engage in appropriate behaviors and to get vaccinated, and a stronger sense of the risk of COVID-19 (although these correlations tended to be stronger in the U.S.). As in Study 1, trust in “conservative” media outlets was generally not associated with our key DVs in the U.K., but were strongly associated in the U.S. Furthermore, as in Study 1, media trust was, if anything, a stronger predictor than political ideology for misperceptions in the U.S. In fact, conservative media trust was twice as strong of a predictor of misperceptions than political ideology in a multiple regression analysis (that also included liberal media trust): liberal media trust: $\beta = -.33, p < .001$, conservative media trust: $\beta = .38, p < .001$, conservatism: $\beta = .18, p < .001^4$. This accords with the idea that political polarization in the U.S. (but not the U.K.) has been – at least in part – driven by the often problematic coverage of the issue in the conservative media ecosystem.

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4 The parallel analysis using party identification produces a similar result: liberal media trust: $\beta = -.33, p < .001$, conservative media trust: $\beta = .49, p < .001$, Republican Party identification: $\beta = .05, p = .264$. 
Table 4. Zero-order correlations between primary measures in United Kingdom (N = 641) and United States of America (N = 697). Party identification is scored such that a higher score indicates a stronger identification with the Republican Party and a lower score indicates a stronger identification with the Democratic Party (and is therefore restricted to individuals who identify with either the Democratic or Republican Party).

|                | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| U.K.           |         |         |         |         |         |         |         |         |
| 1. Misperceptions| -       |         |         |         |         |         |         |         |
| 2. COVID Risk  | -.47*** |         |         |         |         |         |         |         |
| 3. Vaccination Intentions | -.53*** -.38*** | - |         |         |         |         |         |
| 4. Mitigation behaviors | -.31*** .48*** .31*** | - |         |         |         |         |         |
| 5. Conservatism | .21*** -.18*** -.06 -.02 | - |         |         |         |         |         |
| 6. Conserv. Media Trust | .01 .04 .07 .03 | .29*** | - |         |         |         |         |
| 7. Liberal Media Trust | -.31*** .28*** .30*** .14*** -.16*** .53*** | - |         |         |         |         |         |
| 8. Cognitive Sophistication | -.43*** .08* .22*** -.003 -.13** -.08* .14*** | - |         |         |         |         |         |
| U.S.           |         |         |         |         |         |         |         |         |
| 1. Misperceptions| -       |         |         |         |         |         |         |         |
| 2. COVID Risk  | -.72*** | -       |         |         |         |         |         |         |
| 3. Vaccination Intentions | -.55*** .47*** | - |         |         |         |         |         |
| 4. Mitigation behaviors | -.52*** .59*** .47*** | - |         |         |         |         |         |
| 5. Conservatism | .51*** -.54*** -.35*** -.36*** | - |         |         |         |         |         |
| 6. Conserv. Media Trust | .48*** -.43*** -.16*** -.16*** .47*** | - |         |         |         |         |         |
| 7. Liberal Media Trust | -.42*** .39*** .42*** .37*** -.43*** -.05 | - |         |         |         |         |         |
| 8. Cognitive Sophistication | -.35*** .17*** .21*** .07 -.14*** -.27*** .03 | - |         |         |         |         |         |
| 9. Party Identification | .42*** -.47*** -.34*** -.36*** .76*** .39*** -.58*** -.03 | - |         |         |         |         |         |

*** p < .001, ** p < .01, * p < .05

Table 5. Multiple regression analyses (B and 95% Confident Intervals) comparing the correlation between key DVs and ideology across countries (with USA as a baseline). Conservatism was standardized (z-scored) within country prior to analysis. United Kingdom (N = 641), United States of America (N = 697).

|                | Misperceptions | COVID Risk | Vaccination Intention | Mitigation Behaviors |
|----------------|---------------|------------|-----------------------|----------------------|
| Conservatism   | 0.51***       | -0.54***   | -0.35***              | -0.36***             |
|                | [0.44, 0.58]  | [-0.61, -0.47] | [-0.42, -0.28] | [-0.43, -0.29] |
| Conservatism:U.K. | -0.21***    | 0.25***    | 0.20***               | 0.23***              |
|                | [-0.40, -0.20] | [0.26, 0.45] | [0.19, 0.40] | [0.23, 0.44] |
| N              | 1338          | 1338       | 1338                  | 1334                 |
| R2             | 0.16          | 0.17       | 0.07                  | 0.07                 |
Cognitive sophistication

As is evident from Table 4, overall cognitive sophistication (see supplementary materials for sub-scale analysis; Table S9) was a strong negative predictor of COVID-19 misperceptions ($r$'s = -.43, -.36 in the U.K. and U.S., respectively) and, unlike Study 1, also correlated (albeit weakly) with stronger risk perceptions ($r$'s = .08, .17 in the U.K. and U.S., respectively). In the U.K. sample, as in Study 1, cognitive sophistication more strongly predicted misperceptions than did ideology, $z = 4.53, p < .001$, and the same was true for vaccination intentions, $z = 3.15, p = .001$ (these were post hoc tests). However, unlike Study 1, this was not the case in the U.S. sample – in fact, conservatism was a stronger predictor than cognitive sophistication for both misperceptions, $z = 3.51, p < .001$, and vaccination intentions, $z = 2.95, p = .002$ (these were also post hoc tests). What might explain this difference? There are several small mundane differences between Study 1 and 2, such as the different misperception questions and our slightly shorter cognitive sophistication measure. A more likely explanation, however, is that political polarization genuinely increased between March and December. Indeed, there was a noticeable increase in the correlation between political ideology and risk perceptions (which were measured similarly in both studies) in Study 2 ($r = -.54$) relative to Study 1 ($r = -.36$). The same shift is evident in the correlation between ideology and behavior intentions ($r = -.15$ in Study 1, $r = -.36$ in Study 2). Our data indicates substantial polarization around COVID-19 in the U.S. – even relative to our earlier survey in March.

Identity-protective cognition

The foregoing suggests that COVID-19, as of December 2020, represents an even stronger test case for the identity-protective cognition account than it was in Study 1. For this, we interacted ideology and cognitive sophistication separately for our four key dependent variables – focusing, in this case, on the more polarized context of the U.S. (see Table 6). As noted earlier, we administered an additional measure of party identification as a stronger test for the predicted interaction between cognitive sophistication and partisanship (in predicting COVID-19 beliefs and behaviors; see Table 6).

First, there were no interactions between ideology/identity and cognitive sophistication for vaccination intentions, indicating that cognitive sophistication is associated with a stronger likelihood of getting vaccinated for liberals/Democrats and conservatives/Republicans alike. However, there were some significant interactions with the other measures (and, most notably, with political identity for misperceptions). To clarify the underlying interactions, Table 7 reports the correlation between cognitive sophistication and the four COVID-19 measures separately for strong Democrats and strong Republicans (as determined by having a mean score above “agreement” on the identification scale for the respective groups – this was a post-hoc analysis). This analysis shows, consistent with Study 1, that cognitive sophistication is associated with decreased misperceptions about COVID-19 for both groups; however, this correlation is notably weaker for strong Republicans than it is for strong Democrats. Furthermore, COVID-19 risk perceptions and behavior intentions (e.g., mask wearing) were

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5 We forgot to preregister it. In any case, this was a replication of an analysis reported in Study 1.
6 A parallel analysis separating participants based on a single-item affiliation with political party question produced a similar result. Correlation between cognitive sophistication and misperceptions: Democrats, $r(350) = -.40, p < .001$; Republicans, $r(136) = -.17, p = .046$; Independents, $r(181) = -.45, p < .001$. 

nominally negatively correlated with cognitive sophistication among strong Republicans (although these correlations were not significant). Thus, although cognitive sophistication is not significantly associated with beliefs and behaviors about COVID-19, political partisanship does seem to be counteracting and undermining the generally positive influence of having strong reasoning skills.

**Table 6.** Multiple regression analyses (B and 95% Confident Intervals) interacting political conservatism and cognitive sophistication in the prediction of our key dependent variables (U.S. data only). Measures were standardized (z-scored) prior to analysis.

| Measures                  | Misperceptions | COVID Risk | Vaccination Intentions | Mitigation Behaviors |
|---------------------------|----------------|------------|------------------------|----------------------|
| Conservatism              | 0.47***        | -0.53***   | -0.33***               | -0.36***             |
|                           | [0.40, 0.53]   | [-0.59, -0.47] | [-0.40, -0.26]        | [-0.43, -0.29]       |
| Cognitive Sophistication  | -0.29***       | 0.09**     | 0.17***                | 0.02                 |
|                           | [-0.35, -0.23] | [0.03, 0.16]  | [0.10, 0.24]          | [-0.06, 0.09]        |
| Conservatism x CogSoph    | -0.01          | -0.06*     | -0.05                  | -0.10**              |
|                           | [-0.07, 0.05]  | [-0.13, 0.00] | [-0.12, 0.02]        | [-0.18, -0.03]       |
| N                         | 697            | 697        | 697                    | 693                  |
| R2                        | 0.34           | 0.30       | 0.15                   | 0.14                 |

*** p < 0.001; ** p < 0.01; * p < 0.05.

**Table 7.** Zero-order correlations between cognitive sophistication and primary measures among relatively strong Democrats (N = 208) and strong Republicans (N = 127), based on party identification.

| Measures                  | Misperceptions | COVID Risk | Vaccination Intentions | Mitigation Behaviors |
|---------------------------|----------------|------------|------------------------|----------------------|
| Strong Democrats          | -.43***        | .32***     | .18*                   | .24**                |
| Strong Republicans        | -.21*          | -.07*      | .13                    | -.17                 |
The foregoing is broadly consistent with the identity-protective cognition account. However, given the strength of the correlations with media trust relative to political ideology and partisan identification in the U.S., we also performed a post-hoc test including media trust as a control (see Table 8). This analysis revealed that partisan identification did not interact with cognitive sophistication once liberal and conservative media trust (and their interactions with cognitive sophistication) were included in the regression for misperceptions. There was similarly no interaction between partisan identification and cognitive sophistication for vaccination intentions or mitigation behaviors (although it did remain for risk perceptions). In fact, the most consistent predictor across our measures was trust in liberal media outlets.

**Table 8.** Multiple regression analyses (B and 95% Confident Intervals) interacting political conservatism and media trust with cognitive sophistication in the prediction of our key dependent variables (U.S. data only). Measures were standardized (z-scored) prior to analysis.

|                          | Misperceptions  | COVID Risk   | Vaccination Intentions | Mitigation Behaviors |
|--------------------------|----------------|--------------|------------------------|----------------------|
| Party Identification     | 0.11**         | -0.27***     | -0.09                  | -0.21***             |
|                          | [0.03, 0.19]   | [-0.36, -0.18] | [-0.19, 0.01]         | [-0.31, -0.11]       |
| Cognitive Sophistication | -0.24***       | 0.09**       | 0.14***                | 0.01                 |
|                          | [-0.30, -0.18] | [0.03, 0.16]  | [0.07, 0.22]           | [-0.07, 0.09]        |
| Party ID:CogSoph         | 0.08           | -0.12**      | -0.01                  | -0.07                |
|                          | [-0.002, 0.16] | [-0.21, -0.03] | [-0.11, 0.09]         | [-0.17, 0.03]        |
| Liberal Media Trust      | -0.31***       | 0.23***      | 0.30***                | 0.19***              |
|                          | [-0.38, -0.24] | [0.15, 0.30]  | [0.21, 0.38]           | [0.10, 0.27]         |
| Lib Med Trust:CogSoph    | 0.04           | 0.02         | -0.08                  | 0.03                 |
|                          | [-0.03, 0.11]  | [-0.06, 0.09] | [-0.16, 0.01]         | [-0.05, 0.12]        |
| Conserv. Media Trust     | 0.34***        | -0.26***     | -0.10*                 | -0.07                |
|                          | [0.27, 0.40]   | [-0.33, -0.18] | [-0.19, -0.02]        | [-0.16, -0.01]       |
| Con Med Trust:CogSoph    | -0.12***       | 0.13***      | -0.05                  | -0.03                |
|                          | [-0.18, -0.06] | [0.06, 0.19]  | [-0.13, 0.03]         | [-0.11, 0.05]        |
| N                        | 590            | 590          | 590                    | 586                  |
| R2                       | 0.49           | 0.39         | 0.22                   | 0.18                 |

*** p < 0.001; ** p < 0.01; * p < 0.05.

**Discussion**

Anecdotal evidence indicates that partisanship has played a more significant role in the early stages of the public discourse surrounding the COVID-19 pandemic in the United States than in the United Kingdom. Our results support this conclusion: Political ideology was a stronger predictor of beliefs and attitudes relating to COVID-19 (including risk perceptions, behavior change intentions, misperceptions, and support for national leadership) in the U.S. than in the U.K. Interestingly, Canada and the U.S. were more similar although there was nonetheless some evidence that polarization was greater in the U.S. Furthermore, polarization
seems to have increased markedly in the interim between March and December 2020, particularly in the U.S.

Our results demonstrate the potentially life-and-death consequences of the politicization that has occurred in the United States. Our work is consistent with a substantial body of work on the important role that the media and political elites play in forming public opinion (Baum & Potter, 2008; Carmichael & Brulle, 2017; Lewis, 2001; Simon & Jerit, 2007; Zaller, 1992). For example, Carmichael and Brulle (2017) found that elite cues (e.g., from prominent politicians) predicted changes in public opinion about climate change from 2002 to 2013 and that media coverage was also influential, although itself highly influenced by elite cues. It is possible (if likely) that the same factors are important in the context of beliefs about COVID-19. In our data, distrust in liberal media (and trust in the conservative media) were as strongly associated – and in some cases more strongly correlated – with COVID-19 beliefs and behavioral intentions than was political ideology and partisan identification!

**Consequences of analytic thinking**

Despite this political polarization, cognitive sophistication – i.e., the quality of one’s reasoning – was consistently associated with lower misperceptions. In the U.K. and in the early survey in the U.S., cognitive sophistication was a stronger predictor of resistance to misperceptions than was political ideology. Although this reversed by December in the U.S., we found no evidence in any country that cognitive sophistication was associated with stronger misperceptions – thus, at least in terms of avoiding falsehoods about COVID-19, improving scientific literacy and reasoning skills seems an important pathway for inoculation even in the face of political polarization. Still, the contrast between the March and December studies illustrates how increasing polarization in public discourse can undermine the influence of reasoning skills – in particular, the correlation between cognitive sophistication and our various outcome measures was weaker among people who identified with the Republican Party following around ten months of political polarization.

This research resonates with an important claim of science deficit models: That teaching people the basics of science will lead to more acceptance and positive-attitude change. There is some evidence demonstrating the effectiveness of this approach with genetically modified foods (McPhetres et al., 2019) and climate change (Ranney & Clark, 2016). Other research suggests that communicating basic facts, such as the level of scientific consensus around climate change (Linden et al., 2017) is also effective in promoting acceptance of anthropogenic global warming. However, it is also clear that even if this is effective in the aggregate, it is likely to be undermined if political polarization is sufficiently strong.

We also observed an interesting pattern that both supports the conclusions of this research and suggests limits to it: Greater levels of cognitive sophistication was strongly associated with reduced levels of misconceptions and stronger vaccination intentions, but not with behaviour change intentions or mitigation behaviors. This accords with recent work showing that conspiratorial ideation and belief in pseudoscience did not relate to compliance to official COVID-19 recommendations (Díaz & Cova, 2020). This seems to suggest that being reflective, numerate, skeptical, and having basic science knowledge (or some combination of these things) is important for the ability to identify false information about the virus, but it may not be enough
to determine what behaviours are most effective or to motivate one to change their behaviours (apart from those that are strongly linked to misperceptions, such as vaccination intentions).

The foregoing highlights some interesting questions with respect to effective science communication. Given the complexity and level of uncertainty regarding the risks, dangers, and future outcomes of the COVID-19 pandemic, science communicators may wish to focus on communicating consistent behaviours rather than teaching people how the virus works or trying to provide information on risk levels, transmission, or other complex factors. Particularly given the current uncertainty, clear and consistent messages regarding what people should and shouldn’t do seems paramount. Fortunately, this seems to be a major focus of recent efforts. For example, there is some evidence that framing prevention behaviors as benefiting others is more effective than framing them as beneficial for oneself (Jordan et al., 2020), and that emphasizing empathy promotes physical distancing (Pfattheicher et al., 2020).

Evaluating the evidence for identity-protective cognition

Our data indicate parallels between COVID-19 and global warming. Specifically, global warming is one of the few scientific issues where beliefs are more consistently predicted by political ideology (in the U.S.) than cognitive sophistication (McPhetres & Pennycook, 2020). Although this was not apparently the case early on in the pandemic (Study 1) – or even later on in the U.K. – politicization of COVID apparently increased to such an extent that (in the U.S.) ideology and partisan identification became stronger predictors of misperceptions than reasoning skills. Furthermore, we found an interaction between cognitive sophistication and partisan identification among U.S. participants in Study 2, indicating that reasoning skills were more weakly related to having accurate COVID-19 beliefs among Republicans. This is a common finding for climate change as well (Kahan et al., 2012; Kahan et al., 2017; McPhetres & Pennycook, 2020; Pennycook, Cheyne, et al., 2020).

Given that identity-protective cognition is a favored explanation for polarization around climate change (Kahan, 2012; Kahan et al., 2017), do our results indicate that ideology plays a causal role in the formation of false beliefs about COVID-19? There is some reason to be skeptical of this claim. First, trust in news media was a more consistent predictor of misperceptions than political ideology or partisan identification in the U.S. In fact, in Study 2 when polarization was the greatest, both conservative and liberal media trust were three times as strong of predictors of misperceptions as partisan identification. This is of particular importance because partisans engage with different media sources and, therefore, it is possible that polarization is not a result of identity-protective cognition per se, but rather differential exposure to different messaging about COVID-19 (for further discussion of the confounded nature of group difference comparisons in the context of partisan bias, see Druckman & McGrath, 2019; Tappin et al., 2020c).

Furthermore, recent research has shown that cases where cognitive sophistication is associated with increase polarization may be attributable to differences in prior factual beliefs (Tappin et al., 2020a, 2020b). For example, a recent study found that experimentally manipulating reasoning led people to increase the coherence between their prior beliefs about climate change and their evaluation of arguments for or against anthropogenic global warming (Bence Bago et al., 2020). In short, cognitive sophistication may interact with polarization simply because people who tend to be more willing to engage in analytic thinking are more
likely to have strong prior beliefs about political topics. Given that it is not irrational to consider priors when updating beliefs (e.g., Gerber & Green, 1999), partisan “bias” could emerge from differences in information environments and even absent any causal influence of political identities on cognitive processing. Of course, the question of how our identities influence selection into information environments is a critical one.

Another revealing finding from Study 2 was that cognitive sophistication as associated with lower misperceptions even for people who strongly identified with the Republican Party. This is important because identity-protective cognition does not only predict an interaction, but opposing main effects; i.e., people who are better at reasoning should be more likely to believe things that are consistent with their ideology (McPhetres & Pennycook, 2020; Pennycook et al., 2020). Notably, there is some indication that this is occurring (albeit not particularly robustly) in the context of COVID risk perceptions and mitigation behaviors in Study 2. It seems that identity-protective cognition may not be sufficient to cause people to believe falsehoods per se, but it may have impacts on more ephemeral factors like the general sense of worry that someone has about a months-long issue. Further work is needed to verify this potential finding, however.

Conclusion

The COVID-19 pandemic reveals a great deal about the strengths and weaknesses of human psychology. Social scientists have a responsibility to learn as much as possible about people beliefs, attitudes, and behaviors relating to the global pandemic so that we can be more prepared the next time that humanity has to face similar struggles. The present work indicates that political polarization can occur quite rapidly and even in the face of a collective crisis (as in the U.S.), but also that it is not inevitable (as in the U.K.). Furthermore, at least in terms of misperceptions, our findings further support past research on the importance of nurturing competency in cognitive processing as a pre-inoculation against polarized messaging from political elites and vested interests. However, our results also highlight how particularly strong political polarization can blunt the positive effects of analytic thinking – thus, improving the quality of people’s thinking without addressing the underlying political polarization may have limited effectiveness in some cases. Future research should continue to track these developments and further investigate pragmatic long-term interventions that can increase people’s basic reasoning competencies in the face of political polarization.

Acknowledgments

We would like to thank Antonio A. Arechar for assistance executing the experiments. We also gratefully acknowledge funding from the Ethics and Governance of Artificial Intelligence Initiative of the Miami Foundation, the William and Flora Hewlett Foundation, Reset (a project of Luminate), the John Templeton Foundation, the Canadian Institute of Health Research, and the Social Sciences and Humanities Research Council of Canada.

Competing interests

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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Supplementary Materials
for
Beliefs about COVID-19 in Canada, the U.K., and the U.S.A.:
A novel test of political polarization and motivated reasoning

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Table S1. Demographic breakdown by country.

|                      | Study 1 |           |           | Study 2 |           |
|----------------------|---------|-----------|-----------|---------|-----------|
|                      | Canada  | U.K.      | U.S.A.    | U.K.    | U.S.A.    |
| Included N           | 644     | 642       | 689       | 641     | 697       |
| Mean age             | 31.4    | 46.1      | 45.6      | 46.3    | 45.8      |
| Gender               |         |           |           |         |           |
| Male                 | 322     | 306       | 336       | 304     | 330       |
| Female               | 313     | 330       | 345       | 333     | 358       |
| Other                | 9       | 6         | 8         | 4       | 9         |
| Education            |         |           |           |         |           |
| Less than high school degree | 6   | 18        | 5         | 22      | 2         |
| High school graduate | 59      | 105       | 60        | 110     | 70        |
| Some college but no degree | 127 | 137       | 159       | 125     | 156       |
| Associate degree in college (2-year) | 60 | 40        | 70        | 48      | 69        |
| Bachelor's degree in college (4-year) | 296 | 227       | 272       | 222     | 261       |
| Master's degree      | 84      | 85        | 95        | 86      | 113       |
| Doctoral degree      | 5       | 21        | 12        | 17      | 12        |
| Professional degree (JD, MD) | 7   | 9         | 15        | 9       | 14        |
| Ideology             |         |           |           |         |           |
| Liberal              | 415     | 278       | 388       | 286     | 373       |
| Moderate             | 136     | 203       | 144       | 192     | 152       |
| Conservative         | 93      | 161       | 157       | 163     | 172       |

Table S2. Descriptive statistics for major variables in Study 1.

|                      | Canada |           |           | U.K.  |           |           | U.S.A. |           |
|----------------------|--------|-----------|-----------|-------|-----------|-----------|--------|-----------|
|                      | Mean   | Median    | SD        | Mean  | Median    | SD        | Mean   | Median    |
| Misperc_Opt          | 2.01   | 1.88      | 0.68      | 2.10  | 2.00      | 0.67      | 2.03   | 1.88      |
| Misperc_Pess         | 2.33   | 2.25      | 0.86      | 2.35  | 2.25      | 0.90      | 2.22   | 2.00      |
| Misperc_MAGIC        | 1.55   | 1.25      | 0.71      | 1.55  | 1.25      | 0.76      | 1.54   | 1.25      |
| Misperc_Consp        | 1.73   | 1.25      | 0.95      | 1.93  | 1.50      | 1.06      | 1.90   | 1.50      |
| Misperc_Total        | 1.95   | 1.86      | 0.55      | 2.03  | 1.95      | 0.57      | 1.98   | 1.86      |
| Behav_Clean          | 83.12  | 85.83     | 14.42     | 85.17 | 89.17     | 15.33     | 83.71  | 88.00     |
| Behav_Sick           | 81.85  | 84.00     | 12.99     | 81.39 | 83.20     | 13.26     | 84.35  | 87.20     |
| Behav_Distancing     | 87.45  | 91.00     | 12.51     | 90.91 | 94.10     | 11.65     | 88.58  | 92.50     |
| Behav_Total          | 84.88  | 86.62     | 10.49     | 87.00 | 89.45     | 9.98      | 86.18  | 88.90     |
| COVID19 Risk         | 5.81   | 5.88      | 0.78      | 5.93  | 6.13      | 0.82      | 5.67   | 5.88      |
| National Leaders     | 4.66   | 4.70      | 1.14      | 4.08  | 4.10      | 1.39      | 2.57   | 1.70      |
| Cognitive Reflection | 0.68   | 0.67      | 0.29      | 0.62  | 0.67      | 0.29      | 0.62   | 0.67      |
| Numeracy             | 0.65   | 0.67      | 0.26      | 0.63  | 0.67      | 0.29      | 0.58   | 0.50      |
| Sci Knowledge        | 0.74   | 0.76      | 0.18      | 0.72  | 0.76      | 0.18      | 0.74   | 0.76      |
| BS Receptivity (rev) | 3.70   | 3.80      | 0.97      | 3.54  | 3.60      | 1.11      | 3.64   | 3.80      |
| Conservatism         | 2.34   | 2.00      | 0.95      | 2.76  | 3.00      | 0.94      | 2.52   | 2.50      |
Table S3. Percent of participants who agree with various misperceptions about COVID-19 across the three countries for Study 1.

|                                | Optimistic                                                                 | Pessimistic                                                                  | Magical                                                                 | Conspiratorial                                                                 |
|--------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------|
|                                | The seasonal flu is just as dangerous as the coronavirus.                  | Dogs and cats can contract and spread the coronavirus.                       | Vitamin C can cure the coronavirus.                                      | The coronavirus was created in a lab.                                           |
|                                | You can only spread the coronavirus if you feel sick.                     | The vast majority of people who contract the coronavirus will need to be    | Holding your breathe for 10 seconds without discomfort is an effective   | Coronavirus was created to be a bio-weapon.                                     |
|                                | The coronavirus does not survive on plastic or steel for longer than a    | hospitalized.                                                                | way to test if you have coronavirus.                                     | A cure for the coronavirus has already been discovered but is being         |
|                                | few minutes.                                                              | The coronavirus will kill most people who contract it.                      |                                                                          | suppressed by people who want the pandemic to continue.                     |
|                                | Coronavirus symptoms are short lived.                                      | Most people are very likely to contact the coronavirus simply from           |                                                                          | The coronavirus is probably a hoax.                                            |
|                                | Warm weather effectively stops the coronavirus from spreading.            | leaving their house and going for a walk.                                  |                                                                          |                                                                                 |
|                                | You can tell almost immediately (within a day) if you have                |                                                                             |                                                                          |                                                                                 |
|                                | contracted the coronavirus.                                               |                                                                             |                                                                          |                                                                                 |
|                                | The virus is relatively large, so any type of mask can filter it out.     |                                                                             |                                                                          |                                                                                 |
|                                | The coronavirus only stays alive on your hand for about 5-10 minutes.     |                                                                             |                                                                          |                                                                                 |
|                                | The coronavirus is not airborne.                                           |                                                                             |                                                                          |                                                                                 |
|                                |                                                                             |                                                                             |                                                                          |                                                                                 |
| **Mean**                       | 11.8% 16.8% 20.3%                                                         | 12.7% 9.7% 12.2%                                                            | 1.2% 2.8% 1.7%                                                           | 7.0% 11.8% 12.8%                                                              |
|                                | 3.0% 2.2% 1.6%                                                            | 3.0% 4.7% 4.4%                                                             | 6.5% 10.3% 6.4%                                                         | 4.7% 9.4% 11.3%                                                              |
|                                | 3.0% 4.7% 4.4%                                                             | 7.3% 12.6% 10.0%                                                           | 0.6% 0.9% 0.2%                                                          | 3.6% 4.7% 3.6%                                                              |
|                                | 6.5% 15.6% 8.3%                                                           | 1.7% 3.1% 1.6%                                                             | 4.2% 3.1% 3.3%                                                          | 0.6% 1.1% 1.7%                                                              |
|                                |                                                                             | 4.2% 7.3% 4.7%                                                             |                                                                          |                                                                                 |
|                                |                                                                             | 21.1% 15.3% 16.4%                                                          |                                                                          |                                                                                 |
|                                | **Mean** 7.0% 9.0% 7.8%                                                   | **Mean** 8.5% 8.9% 8.7%                                                    | **Mean** 2.4% 4.2% 2.7%                                                 | **Mean** 4.0% 6.7% 7.4%                                                      |
|                                |                                                                             |                                                                             |                                                                          |                                                                                 |
Table S4. Multiple regression analyses (β and 95% Confident Intervals) comparing the correlation between key DVs and ideology across countries (with USA as a baseline) with demographic controls (Study 1). Conservatism was standardized (z-scored) within country prior to analysis.

| Variable                  | Misperceptions | COVID Risk | Change Intentions |
|---------------------------|----------------|------------|-------------------|
| Conservatism              | .34***         | .35***     | -.17***           |
| Conservatism:U.K.         | -.11**         | .19***     | .13***            |
| Conservatism:Canada       | -.03           | .07*       | .02               |
| Age                       | -.15***        | .04        | .16***            |
| Male                      | -.03           | -.09***    | -.17***           |
| Education                 | -.07**         | .03        | .01               |
| Income                    | -.14***        | .06*       | .10***            |
| Health                    | .01            | -.05*      | -.003             |
| N                         | 1947           | 1947       | 1943              |
| R2                        | 0.10           | 0.08       | 0.08              |

Table S5. Correlations (Pearson’s r) individual measures of cognitive sophistication and COVID-19 measures (3 countries combined; N = 1970) in Study 1.

|                          | Cognitive Reflection | Numeracy | Sci Knowledge | BS Receptivity (rev) |
|--------------------------|----------------------|----------|---------------|-----------------------|
| Misperceptions           | -.235**              | -.252**  | -.416**       | -.251**               |
| COVID Risk               | -.022                | -.04     | .060**        | -.054*                |
| Change Intentions        | -.031                | -.060**  | -.013         | -.060**               |

** p < .01, * p < .05

Note that BS Receptivity is reverse-scored such that a higher score = lower BS receptivity.

Table S6. Descriptive statistics for major variables in Study 2.

|                      | U.K.       | U.S.A.     |
|----------------------|------------|------------|
|                      | Mean | Median | SD  | Mean | Median | SD  |
| Misperc_Total        | 1.99  | 1.83   | 0.73| 2.13  | 1.75   | 1.07|
| Behav_Total          | 83.15 | 87.13  | 15.23| 84.30 | 89.73  | 16.70|
| COVID19 Risk         | 2.33  | 2.00   | 1.17| 2.12  | 1.75   | 1.28|
| Vaccination Intention| 4.16  | 5.00   | 1.20| 3.84  | 4.00   | 1.38|
| Cognitive Reflection  | 0.63  | 0.67   | 0.29| 0.57  | 0.67   | 0.31|
| Numeracy             | 0.62  | 0.67   | 0.27| 0.54  | 0.50   | 0.29|
| Sci Knowledge        | 0.69  | 0.75   | 0.24| 0.68  | 0.75   | 0.25|
| BS Receptivity (rev) | 3.62  | 3.60   | 1.03| 3.56  | 3.60   | 1.09|
| Conservatism         | 2.72  | 3.00   | 0.92| 2.59  | 2.50   | 1.17|
| Partisan ID          |        |        |     | 5.79  | 4.21   | 3.76|
| Liberal Media Trust  | 2.99  | 3.00   | 0.93| 2.83  | 3.00   | 1.04|
| Conserv. Media Trust | 2.17  | 2.00   | 0.76| 1.77  | 1.50   | 0.85|
Table S7. Percent of participants who agree with various misperceptions about COVID-19 across the two countries for Study 2.

| Misperceptions                                                                 | U.K.   | U.S.   |
|--------------------------------------------------------------------------------|--------|--------|
| The seasonal flu is just as dangerous as COVID-19.                              | 19.5%  | 17.5%  |
| The coronavirus that causes COVID-19 was engineered as a bioweapon in a Chinese lab. | 9.7%   | 16.6%  |
| COVID-19 is being used to cover up harmful health effects associated with exposure to 5G wireless technology. | 0.9%   | 4.2%   |
| Drugs such as hydroxychloroquine are effective in treating patients who have been infected with COVID-19. | 11.2%  | 14.5%  |
| Regularly rinsing your nose with a saline solution can help protect people from infection with the coronavirus that causes COVID-19. | 3.1%   | 6.7%   |
| The vast majority of people who contract COVID-19 will need to be hospitalized. | 4.4%   | 12.2%  |
| Holding your breath for 10 seconds without discomfort is an effective way to test if you have COVID-19. | 3.3%   | 6.2%   |
| Wearing masks doesn’t help to prevent infection from COVID-19.                 | 10.5%  | 10%    |
| The cure for COVID-19 has already been discovered but is being suppressed by people who want the pandemic to continue. | 2.5%   | 9.5%   |
| Bill Gates is responsible for creating the coronavirus that causes COVID-19.   | 0.9%   | 3.7%   |
| Doctors are being paid/forced to report all deaths as COVID-19 deaths.         | 9.7%   | 15.5%  |
| Some people are getting infected with COVID-19 at testing centers intentionally because authorities want to inflate the number of cases. | 1.9%   | 6.6%   |
| **Mean**                                                                      | **6.5%** | **10.3%** |

Table S8. Multiple regression analyses (β and 95% Confident Intervals) comparing the correlation between key DVs and ideology across countries (with USA as a baseline) with demographic controls (Study 2). Conservatism was standardized (z-scored) within country prior to analysis.

|                           | Misperceptions | COVID Risk | Vaccination Intention | Mitigation Behaviors |
|---------------------------|----------------|------------|------------------------|----------------------|
| Conservatism              | .544***        | -.550***   | -.382***               | -.392***             |
| Conservatism:U.K.         | -.200***       | .241***    | .198***                | .212***              |
| Age                       | -.149***       | .090**     | .129***                | .222***              |
| Male                      | -.044          | -.066**    | .095***                | -.082**              |
| Education                 | -.031          | -.033      | .033                   | -.003                |
| Income                    | -.116***       | .019       | .131***                | .003                 |
| Health                    | .027           | -.063*     | .044                   | -.087**              |
| N                         | 1321           | 1321       | 1321                   | 1317                 |
| R2                        | 0.19           | 0.18       | 0.11                   | 0.13                 |
Table S9. Correlations (Pearson’s $r$) individual measures of cognitive sophistication and COVID-19 measures (2 countries combined; $N = 1970$) in Study 2.

|                          | Cognitive Reflection | Numeracy | Sci Knowledge | BS Receptivity (rev) |
|--------------------------|----------------------|----------|---------------|-----------------------|
| Misperceptions           | - .270**             | - .291** | - .328**      | - .226**              |
| COVID Risk               | .088**               | .083**   | .110**        | .073**                |
| Vaccination Int.         | .174**               | .184**   | .181**        | .078**                |
| Mitigation Beh.          | .016                 | -.024    | .052          | .046                  |

** $p < .01$, * $p < .05$

Note that BS Receptivity is reverse-scored such that a higher score = lower BS receptivity.