

# The unique roles of threat perception and misinformation accuracy judgments in the relationship between political orientation and COVID-19 health behaviors

Vincenzo J. Olivett<sup>1</sup>  | Heather M. Maranges<sup>2</sup> | David S. March<sup>1</sup> 

<sup>1</sup>Department of Psychology, Florida State University, Tallahassee, Florida, USA

<sup>2</sup>Department of Human Development and Family Science, The Family Institute, Florida State University, Tallahassee, Florida, USA

## Correspondence

Vincenzo J. Olivett, Department of Psychology, Florida State University, Tallahassee, FL, USA.

Email: [olivett@psy.fsu.edu](mailto:olivett@psy.fsu.edu)

## Abstract

Not everyone engages in COVID-19 related preventative health behaviors (PHB; e.g., mask wearing, social distancing) despite their demonstrated effectiveness for mitigating the spread of COVID-19. In the United States, for instance, PHBs emerged as (and remain) a partisan issue. The current work examines partisan gaps in PHB by considering both informational and perceptual factors related to COVID-19. Specifically, we focus on politically motivated belief in COVID-19 (mis)information and simultaneously consider the roles of physical threat and disgust perception. We find that poor performance in misinformation accuracy judgments and subsequently lower COVID-19 threat perceptions sequentially predict less PHB engagement. In Study 1 ( $N = 87$  US undergraduate students), higher conservatism predicted lower COVID-19 threat perceptions but not COVID-19 disgust perceptions. Study 2 ( $N = 168$  US undergraduate students) replicated this effect, while demonstrating that the relationship between stronger conservatism and lower engagement in PHB was mediated by higher accuracy judgments of COVID-19 misinformation and, in turn, lower perceptions of COVID-19 threat but not disgust. This suggests that considering threat perception is essential to understanding how politically motivated endorsement of COVID-19 misinformation shapes PHB.

## 1 | INTRODUCTION

Preventative health behaviors (PHB) were (and are) critical for mitigating the spread of COVID-19. Both nonpharmaceutical interventions (e.g., mandatory face masks) and reduced social interactions helped diminish viral growth rate (Bo et al., 2021). Yet many people disregard preventative measures and policies, largely due to non-health-related social reasons. In the United States, for instance, willingness to engage in social distancing became closely aligned with political identity such that self-identifying Republicans (vs. Democrats) and 2016 Trump (vs. Clinton) voters less frequently socially distanced and engaged in other PHB (Hsiehchen et al., 2020). Uncovering mechanisms by which PHB engagement emerged as a

partisan issue is particularly important given its link to detrimental health outcomes (Gollwitzer et al., 2020).

Some have hypothesized that partisan-driven differences in PHB result from differential exposure to and endorsement of COVID-19 (mis)information. This view is plausible, indirectly implied by extant data, and likely partially correct. Yet we suggest that it is underspecified and misses an important part of the story as considering only informational factors renders an incomplete model of a more complex psychological process. Informational factors, like uptake of misinformation, do not directly influence judgments and behaviors. Instead, they influence the attitudes and perceptions that drive the subsequent judgments and behaviors (Bechler et al., 2021; Fazio & Zanna, 1981; Friedkin, 2010). Consequently, prior research may be

spuriously implying a direct relationship between exposure to or belief in misinformation and PHB (e.g., Green & Murphy, 2021). In our view, this relationship can be explained by accounting for COVID-19 threat (and possibly disgust) perceptions. That is, partisan differences in misinformation uptake do not directly influence behaviors but are instead mediated by theoretically downstream threat or disgust perception. It is therefore essential to consider the role of misinformation beliefs *distinct* from that of threat/disgust perception in influencing people's decisions to engage in COVID-19 PHB.

In the current work, we propose a model that considers the role of both informational and perceptual factors in the link between political orientation and PHB. We argue that relatively more conservative people may less frequently engage in PHB due to (mis)information-driven perceptions of COVID-19 as relatively less physically threatening. We first narrow which perceptual factor of COVID-19 (i.e., threat vs. disgust) is more strongly associated with political orientation. Then, crucially, we test a model relying on the idea that, (1) partisans may differentially judge the accuracy of (mis)information about COVID-19, which (2) leads to differential perceptions of COVID-19 as threatening, and, subsequently, (3) differences in responding to the pandemic with PHB. We test whether partisan differences in PHB emerge from differential accuracy judgments of dubious COVID-19 information and their implications for COVID-19 threat perception. It is our expectation that this model will offer more granular insights on how to promote PHB.

## 1.1 | Motivated uptake of COVID-19 information

News coverage of the pandemic continues to be highly politicized and polarized (Hart et al., 2020), leaving an ostensibly nonpolitical health matter susceptible to ideologically motivated processes (Bolsen et al., 2014). Across domains, partisans seek out and credit information consistent with their political worldviews and discredit information inconsistent with their political worldviews (Kahan, 2017; Peterson & Iyengar, 2020). Partisan-driven exposure to (mis)information therefore affects what people know about COVID-19. Consequently, differential information exposure and processing results in knowledge of and beliefs in different “facts.” In this case, the result is that COVID-19 related misinformation varies along partisan lines. Indeed, conservatives (vs. liberals) demonstrate less COVID-19 knowledge and less accurately answer questions related to the science of COVID-19 (Shao & Hao, 2020).

Politically motivated exposure and scrutiny of COVID-19 misinformation is likely to influence related perceptions of COVID-19. Supporting this view, conservatives (vs. liberals) endorse more incorrect COVID-19 information (Calvillo et al., 2020) and inaccurately perceive lower risk of infectibility and less personal vulnerability to COVID-19 (J. Kerr et al., 2021; Shao & Hao, 2020). This pattern holds even among conservatives who report higher general (non-COVID-19 specific) germ aversion (Makhanova & Shepherd, 2020), implying that partisan motives have drastically affected what people perceive about COVID-19. Rectifying lower conservative (vs. liberal) COVID-19 health

concerns with typically higher conservative (vs. liberal) pathogen and threat sensitivity (Smith et al., 2011) is the idea that politicized informational factors may differentially motivate conservative versus liberal consumption and interpretation of COVID-19 related information. Consequently, liberals versus conservatives (in the United States) vary in what information they consume and believe about COVID-19, which in turn might influence how they perceive COVID-19. Specifically, as we detail below, motivated processing may be especially important for perceptions of COVID-19 as a threat (e.g., harmful, dangerous, deadly), which we argue is an empirically overlooked driver of engagement in PHB.

### 1.1.1 | The role of threat perception in driving preventative health behavior

Perceptions of physical threat and pathogen threat are associated with psychological and physical responses tailored toward self-preservation; thus, both might serve as proximal predictors of COVID-19 PHB (e.g., March et al., 2017, 2022; Schaller & Park, 2011). Yet, the processing of and response to immediate physical threat stimuli are preferential and distinct from the processing of and responses to disgust (i.e., pathogen) stimuli (March et al., 2018). That is, physical threat information is processed unique to other classes of information, including information linked to disgust. COVID-19 physical threat-perception should therefore have a unique influence on PHB—behaviors aimed at protecting one from harm via COVID-19—over and above other negative valence perceptions (e.g., disgust).

#### *Perception of pathogen threat/disgust*

As a transmittable disease, COVID-19 might evoke adaptive responses to pathogen threats including disgust perception and response (Oaten et al., 2009). In line with this view, much recent research (e.g., Makhanova & Shepherd, 2020; McKay & Asmundson, 2020; Shook et al., 2020) on behavioral responses to COVID-19 drew on the Behavioral Immune System framework (BIS; Schaller & Park, 2011), which describes evolved psychological mechanisms—including disgust perceptions and responses—for detecting and avoiding pathogens threats. For example, individual differences in a general germ aversion, trait pathogen disgust sensitivity, and perceived personal infectibility were found to be associated with concern about COVID-19 and PHB such as handwashing and social distancing (Makhanova & Shepherd, 2020; Shook et al., 2020).

Yet, caution is emerging regarding the applicability of BIS logic to modern day pandemics (see Ackerman et al., 2021 for a detailed analysis). Such skepticism stems from the idea that there is a mismatch between the contexts in which BIS mechanisms evolved and those of modern-day pandemics. For example, population density and connectivity vary significantly between historical (e.g., hunter-gatherer societies) and modern-day societies. Thus, mechanisms tailored to respond to rapid contagion across large geographic

areas (e.g., COVID-19 spread through airline travelers) likely do not exist within the BIS because similar challenges were not faced in humans' evolutionary past. Other psychological processes outlined by BIS theory likewise face possible mismatches. Touch aversion to surfaces resembling biological tissue likely evolved as a part of BIS, whereas the tactile surfaces of putative COVID-19 fomites (e.g., tables, doorknobs) do not resemble biological tissues. Similarly, disgust perception and response are calibrated to detectable cues of infection such as open wounds and rotting odors, whereas no such cues are present among COVID-19 infected individuals (Ackerman et al., 2021). Even coughing, an ostensible cue for respiratory infection, is an unreliable signal of infection among perceivers (Michalak et al., 2020). In sum, despite intuitive appeal, pathogen threat and disgust-related mechanisms might not be sensitive to challenges of modern-day pandemics, including COVID-19.

#### *Perception of physical threat*

Indirect support for a role of COVID-19 physical threat perceptions in the proximate processes driving health behaviors comes from research showing that perceptions of COVID-19 as “feared” or a “severe health problem” reliably predicted PHB (Franz & Dhahni, 2021). For example, people who perceived greater “seriousness” (measured via agreement with the statement, “The coronavirus is a serious disease,” Franz & Dhanani, 2021) or “severity” of COVID-19 (measured via agreement with three statements: “I believe coronavirus is a severe health problem,” “I believe that getting coronavirus is a serious threat to my health,” and “I believe that getting coronavirus could have serious health consequences,” Ranjit et al. (2021) more often wore face masks, engaged in social distancing, and avoided social gatherings in the United States. However, “severity” is an ambiguous concept. It is unclear whether the seriousness of COVID-19 “as a disease” reflects the specific danger or harm connoted by COVID-19 or the degree of disgust towards COVID-19 or some other facet of seriousness (e.g., to financial well-being, to social cohesion). Second, conflating perceptions of COVID-19 as a generally “severe health problem” with a “threat to my health” obscures the source of the perceived severity and says nothing about the role of threat and/or disgust perceptions.

#### *Political orientation and the perception of pathogen threat/disgust and physical threat*

Some have suggested that pathogen and physical threat sensitivity covary with political orientation. Specifically, conservatism is thought to correspond with greater sensitivity to both pathogen and physical threat stimuli (Hibbing et al., 2014; cf. Johnston & Madson, 2022). Evidence supporting a link between conservatism and physical threat sensitivity comes from research demonstrating that conservatives evince larger physiological responses to threat-related stimuli (Bakker et al., 2020; Osmundsen et al., 2022; Oxley et al., 2008) and possess personality traits linked to fearful responding such as lower openness to experience (Lilienfeld & Latzman, 2014). Conservatives likewise exhibit larger physiological responses to disgust-evoking stimuli (Smith et al., 2011). If these patterns hold, conservatives versus liberals may perceive COVID-19 to be both more threatening and more disgusting.

Prior work, however, also suggests that perceptions of COVID-19 disgust are shaped by informational factors such as susceptibility to misinformation and trust in scientific information, leading to greater disgust of COVID among liberals compared to conservatives (Calvillo et al., 2020; Samore et al., 2021). Yet as stated earlier, research on COVID-19 disgust perceptions may overstate the applicability of BIS mechanisms to the current human experience with COVID-19 (Ackerman et al., 2021). Further, while the role of threat has been indirectly explored, preliminary evidence is ambiguous. Prior work either fails to separately distinguish threat and disgust perceptions or conflates them within measures. Consequently, when considering the role of political partisanship in driving PHB, it is necessary to first establish whether there exist partisan differences in threat versus disgust of COVID-19 by clearly operationalizing threat as separate from disgust. The current work overcomes these limitations by first distinguishing partisan differences in perceiving the threat (i.e., danger, harm) of COVID-19 from disgust of COVID-19 and then testing the consequence of partisan differences in COVID-19 threat and disgust perception on PHB. That is, the current work speaks directly to the perceptions of COVID-19 that likely drive PHB by simultaneously operationalizing and comparing the contribution of both threat and disgust.

#### 1.1.2 | The current work

Taken together, the work reviewed above suggests that (1) partisans differentially consume and scrutinize information about COVID-19, (2) informational factors influence perceptions of COVID-19, and (3) perceptions of COVID-19 play an important role in facilitating PHB. Yet, no prior work has considered these processes simultaneously in understanding why partisan differences in PHB emerge. Additionally, prior work is underspecified in terms of what precise perceptions of COVID-19 are more proximal for PHB. The current work addresses these gaps by proposing a serial mediation model in which political orientation shapes the ability to judge accuracy of misinformation that, in turn, affects perceptions of COVID-19 threat and ultimately PHB. First, as mentioned above, we distinguish the partisan influence on COVID-19 threat perception from the partisan influence on COVID-19 pathogen disgust. We first tested whether threat versus disgust is more so associated with political partisanship and whether threat or disgust can account for the relationship between the other and political partisanship (i.e., controlling for the other; Study 1). In light of the results of Study 1, Study 2 tested the serial mediation model, that is, whether political partisanship predicts PHB in part due to differences in the ability to judge the accuracy of misinformation and subsequent differences in perceptions of COVID-19 as a physical threat (vs. as a disgust threat).

Recent work has further highlighted a distinction between *social conservatism* (i.e., support for traditional social values) and *economic conservatism* (i.e., support for social hierarchy and economic inequality; Claessens et al., 2020; Feldman & Johnston, 2014). No research has explored whether social versus economic conservatives differentially perceive COVID-19 threat versus disgust. Although the focus of the

current work is on general all-inclusive political conservatism, exploratory analysis of the relationship between social and economic conservatism and COVID-19 related PHB can be found in the Supporting Information.

## 2 | STUDY 1

Study 1 tested whether political orientation was associated with threat and disgust perceptions of COVID-19. Given findings from the early pandemic linking conservatism and lower perceptions of COVID-19 as harmful (Franz & Dhanani, 2021), we expected that relatively conservative people would perceive COVID-19 to be less threatening and less disgusting. However, previous work did not empirically distinguish between perceived threat and perceived disgust. Threat (i.e., danger to physical harm) and other types of negativity (e.g., disgust) are processed distinctly and have unique implications for defensive behavior (March et al., 2018). Given the defensive nature of PHB, we expected that the association between political orientation and threat of COVID-19 would be stronger than the association between political orientation and disgust of COVID-19.

### 2.1 | Methods

#### 2.1.1 | Participants

Data were collected online in the fall of 2020 via Qualtrics from 90 undergraduate students at a southeastern US university who participated for partial course credit. Excluding 3 people who failed the attention check yielded a final sample of 87 participants (67 women,  $M_{\text{age}} = 19.5$ ; 61 White; 16 Hispanic; 6 Black American; 2 Asian; 2 Middle Eastern). Post hoc analysis of achieved power indicated at least 80% power to detect all critical effects.

#### 2.1.2 | Procedure and materials

Participants responded to questions about their political orientation, perceptions of the danger and disgust of COVID, and demographics. COVID-19 danger and disgust items were taken from work measuring threat and disgust of different stimuli (e.g., spiders; Armfield, 2007). See Table 1 for descriptive statistics.

**Political orientation:** Participants responded to the item “What is your political orientation?” on the scale: 1-very liberal, 2-liberal, 3-neither liberal nor conservative, 4- conservative, 5-very conservative.

**Threat of COVID-19:** Participants responded to two items about the extent to which they perceived COVID-19 as dangerous on a 1 (not) to 7 (extremely) scale: “How potentially dangerous do you think that COVID-19 is to you?”; “How powerful/harmful do you think COVID-19 is?”. Responses to both items were averaged to create a COVID-19 threat composite.

**TABLE 1** Descriptive statistics and Pearson's correlation coefficients of regression variables

Variables	Mean	SD	1.	2.	3.
1. Political orientation	2.84	1.06	-	-.53***	-.22*
2. COVID-19 threat	4.18	1.17		-	.47***
3. COVID-19 disgust	3.64	0.89			-

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

**Disgust of COVID-19:** Participants responded to three items that captured the extent to which they found COVID-19 disgusting on 1 (strongly disagree) to 7 (strongly agree) scale: “If I was near someone with COVID-19 it would be important for me to wash my hands afterward”; “I think that people who have COVID-19 are dirty or unclean”; “I would be disgusted or revolted if I contracted COVID-19.” Response to all three items were averaged to create a COVID-19 disgust composite.

### 2.2 | Results

We first tested the zero-order bivariate associations among Political orientation, Threat of COVID-19, and Disgust of COVID-19 via Pearson correlation analyses (Table 1). Political Orientation was negatively associated with both COVID-19 Threat and COVID-19 Disgust, such that the more conservative people were, the less they perceived COVID-19 to be threatening or harmful.

We corroborated those analyses with a generalized linear multiple regression analysis in which Political orientation predicted both COVID-19 threat and disgust ratings: higher conservatism predicted lower Threat ratings,  $b = -0.59$ ,  $F(1,86) = 33.97$ ,  $p < .0001$ ,  $CI_{95} [-0.79, -0.39]$ ,  $R^2 = .29$ , and lower disgust ratings,  $b = -.18$ ,  $F(1,86) = 4.29$ ,  $p = .0413$ ,  $CI_{95} [-0.36, -0.01]$ ,  $R^2 = .05^1$  (Figure 1; a version of Figure 1 with raw data points and confidence intervals can be found in the Supporting Information).

Next, we tested whether Political Orientation was more strongly associated with COVID-19 threat perceptions or disgust perceptions by conducting two separate linear regression analyses in which political orientation predicted COVID-19 threat (disgust) perceptions controlling for COVID-19 disgust (threat) perceptions. When controlling for disgust, political orientation continued to predict Threat,  $b = -.50$ ,  $F(1,86) = 28.15$ ,  $p < .0001$ ,  $CI_{95} [-0.68, -0.31]$ ,  $R^2 = .42$ , but controlling for Threat rendered the association between political orientation and disgust nonsignificant,  $b = .04$ ,  $F(1,86) = 0.18$ ,  $p = .6740$ ,  $CI_{95} [-0.15, 0.23]$ ,  $R^2 = .23$ .

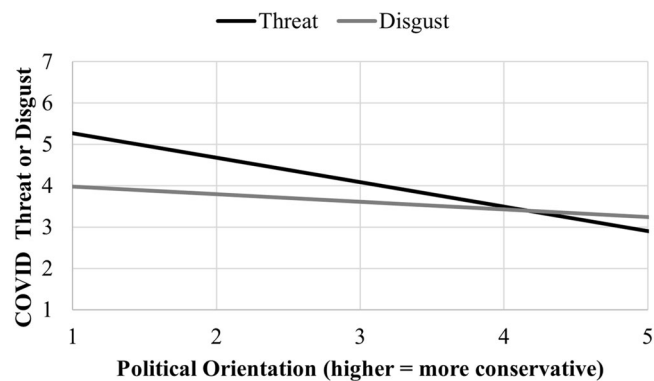
### 2.3 | Discussion

More conservative individuals perceived lower COVID-19 threat and, to a lesser extent, perceived lower COVID-19 disgust. Controlling for

threat diminished to nonsignificance the relationship between political orientation and COVID-19 disgust; on the contrary, controlling for disgust did not affect the relationship between political orientation and COVID-19 threat. Together these results imply that perception of COVID-19 disgust derives from an overarching perception of COVID-19 threat. Next, we aim to shed light on a potential mechanism by which conservatives come to view COVID-19 as less threatening than liberals and the implications of these perceptions for health-related behaviors: ability to discern misinformation.

### 3 | STUDY 2

Study 2 tested our proposed model—that more conservative (vs. liberal) individuals engage in fewer COVID-19 related PHB, and this is accounted for by belief in COVID-19 misinformation and, subsequently, perceiving COVID-19 as less threatening. We also improve



**FIGURE 1** Regression lines of the relationships between political orientation and threat and disgust

Variables	Mean	SD	1.	2.	3.	4.	5.	6.
1. Political orientation <sup>a</sup>	3.47	1.58	-	.23**	-.60***	-.43***	-.28***	-.27***
	52.98	15.01						
3. Misinformation accuracy judgment	3.15	0.78	-	-.25***	-.12	-.004	-.02	
4. COVID-19 threat	4.61	1.38	-		.65***	.52***	.29***	
5. PHB	4.07	1.12	-			.60***	.17*	
6. PVD	4.32	0.81	-				-.22**	
7. COVID-19 disgust	2.42	1.39	-					-

Note: *p* Value threshold is uncorrected for multiple comparisons as the table is merely descriptive (see below for main analyses).

Abbreviations: PVD, personal vulnerability to disease.

<sup>a</sup>The top number is the average of the three 1–7 scale items; the bottom number is the average of the SECS score; correlations are with the composite average of the two Z-scored scales.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

upon the measure of political orientation in Study 1 by expanding it to social and economic issues.

### 3.1 | Methods

#### 3.1.1 | Participants

Data were collected online in the spring of 2021 via Qualtrics from 198 undergraduate students at a southeastern US university who participated for partial course credit. Excluding 30 people who failed at least 1 of 3 attention checks resulted in a final sample of 168 participants (137 women,  $M_{\text{age}} = 19.6$ ; 93 White; 29 Hispanic; 24 Black American; 17 Asian; 3 Native American or Alaska Native; 1 Native Hawaiian or Pacific Islander; 1 other). Post hoc analysis of achieved power indicated at least 80% power to detect all critical effects.

#### 3.1.2 | Procedure and materials

Participants reported their political orientation and 2020 presidential election voting behavior before completing a COVID-19 related misinformation accuracy judgment task. Next, participants responded to measures of their perceptions of COVID-19 as threatening and disgusting (same as in Study 1), COVID-19 related PHB, and demographics. We also included a measure of perceived vulnerability to disease (PVD) in general as a control variable. See Table 2 for descriptive statistics.

#### Misinformation accuracy judgments

Participants were asked to judge whether 18 news stories about COVID-19, represented by a picture and a headline, depicted accurate information (Calvillo et al., 2020). There were nine real

**TABLE 2** Descriptive statistics and Pearson's correlation coefficients of mediation variables

stories depicting true information and nine fake stories depicting misinformation. See Supporting Information for stimuli. Participants saw one story picture/headline per page and rated it on a scale from 1 (*not accurate at all*) to 7 (*very accurate*). Our focus is on accuracy judgments of misinformation presented in the fake news headlines, for which higher scores represent higher judged accuracy (i.e., incorrectly identifying misinformation as accurate).

#### Political orientation

Participants responded to four measures of political orientation, which were combined to create the political orientation composite. The first three items asked, “What is your political orientation?”, “For social issues, where would you place yourself on this scale?”, and “For economic issues, where would you place yourself on this scale?”. Participants responded on a scale from 1 (*extremely liberal*) to 7 (*extremely conservative*) with the additional option 0 (*I haven't thought much about it*). We averaged across these three items to create the Likert composite. The fourth measure captured people's support for specific economic and social policy issues (Social and Economic Conservatism Scale [SECS]; Everett, 2013). This 12-item scale asks participants to rate their opposition-to-support for each of 12 issues on a scale from 0 (*oppose*) to 50 (*neutral*) to 100 (*support*). Most items are policy issues typically supported by conservatives—that is, *limited government, military and national security, freedom of religion, gun rights, traditional values, fiscal responsibility, business, the family unit, and patriotism*—and some are issues typically supported by liberals (reverse coded)—that is, *gay marriage, welfare benefits, abortion rights*. Items were averaged. To create the final composite of political orientation, we made a mean of the Z-scored Likert-composite and the Z-scored issues-composite for each participant. Higher scores represent more conservatism versus liberalism.

#### Voting behavior

Participants indicated whether they voted for Joe Biden, Donald Trump, or neither in the 2020 election. As this item is ancillary to our main hypotheses, we include verbatim phrasing, results, and discussion of this item in the Supporting Information.

#### PHB

Participants responded to 34 items about COVID-19 related health behaviors in which they engage to avoid becoming infected with the virus. We adapted these items from a behavioral health intention measure (Pennycook et al., 2021) to capture current behavior (see Supporting Information). Participants rated their agreement with items (e.g., “I try to stay home whenever possible, even if I am **not** sick”) on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale and also rated whether they avoid doing certain activities (e.g., “Going to the airport and flying”) on a 1 (*do no avoid*) to 7 (*completely avoid*) scale. Responses to these items were averaged to create the PHB composite measure.

#### PVD

So that we could control for participants' general susceptibility to illness, participants reported their PVD (Duncan et al., 2009) on 15 items, such as

“In general, I am susceptible to colds, flu and other infectious diseases,” on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. Responses to all 15 items were averaged to create the measure of PVD.

## 3.2 | Results

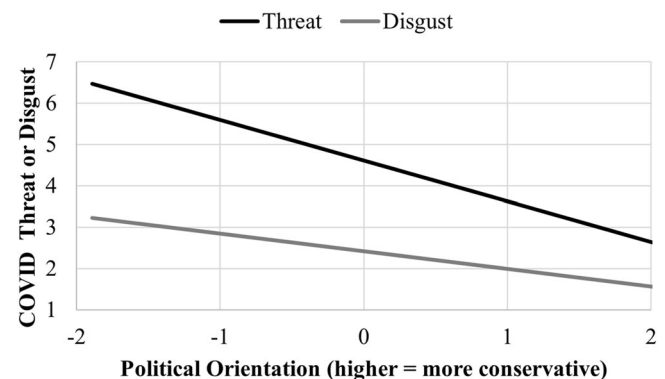
To corroborate Study 1 results, we first replicated the Study 1 analyses comparing the strengths of the associations between political orientation and perceptions of COVID-19 threat and disgust. We then tested our proposed model(s): political orientation→misinformation accuracy judgments→COVID-19 threat (disgust)→PHB. All analyses used the standardized average political orientation composite. Regression analyses using only the (1) political orientation 1–7 scale, (2) SECS economic subscale, and (3) SECS social subscale can be found in the Supporting Information. The patterns of effects are consistent across scales of political orientation.

### 3.2.1 | Threat versus disgust of COVID-19

As in Study 1, political orientation was negatively associated with both COVID-19 threat and COVID-19 disgust, suggesting that conservatives perceived COVID-19 as less threatening and less disgusting than did liberals (Table 2).

A generalized linear multiple regression in which political orientation predicted both COVID-19 threat and disgust indicated higher conservatism predicted lower threat ratings,  $b = -.98$ ,  $F(1,167) = -129.94$ ,  $p < .0001$ ,  $CI_{95} [-1.15, -0.81]$ ,  $R^2 = .44$ , and lower disgust ratings,  $b = -.43$ ,  $F(1,167) = 14.88$ ,  $p = .0002$ ,  $CI_{95} [-0.65, -0.21]$ ,  $R^2 = .08^2$  (Figure 2; a version of Figure 2 with raw data points and confidence intervals can be found in the Supporting Information).

Replicating Study 1, when controlling for disgust, political orientation continued to predict threat,  $b = -.94$ ,  $F(1,167) = 109.67$ ,  $p < .0001$ ,  $CI_{95} [-1.11, -0.76]$ ,  $R^2 = .45$ , but when controlling for threat, political orientation no longer predicted disgust,  $b = -.25$ ,  $F(1,167) = 1.82$ ,  $p = .0915$ ,  $CI_{95} [-0.54, 0.04]$ ,  $R^2 = .10$ .



**FIGURE 2** Regression lines of the relationships between political orientation and threat and disgust

### 3.2.2 | Serial mediation model

Examining the zero-order bivariate associations among political orientation and misinformation accuracy judgments, PHB, and PVD, we find that political orientation is positively associated with misinformation accuracy judgments and negatively associated with PHB and PVD (see Table 2). That is, the more conservative versus liberal people are, the more accurate they judge misinformation to be, the less often they engage in PHB, and the less personally vulnerable to disease they feel.

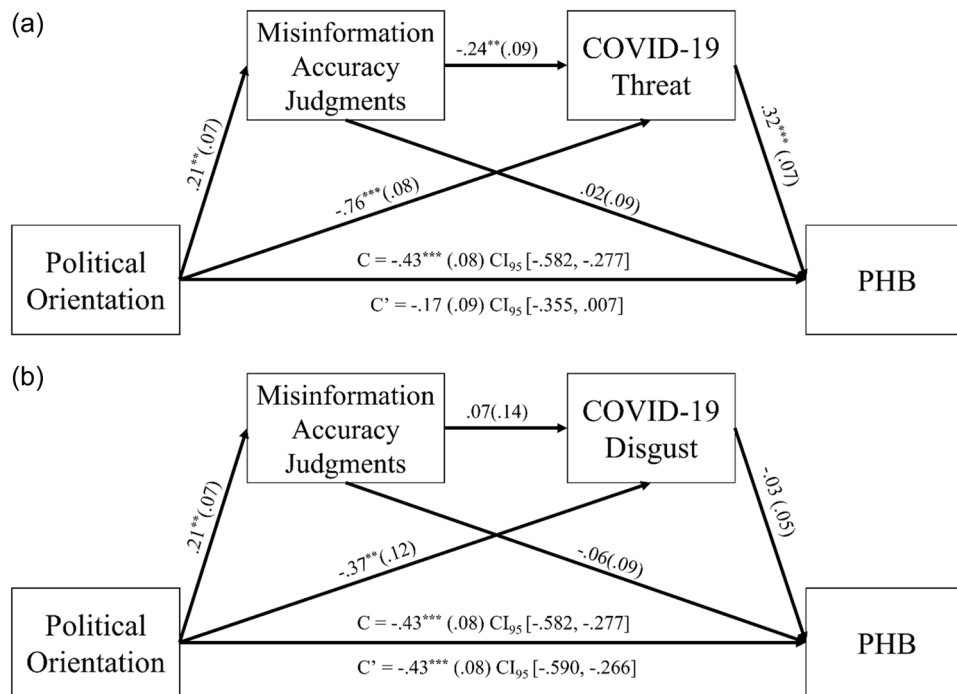
Based on our theory, the results of Study 1, and Study 2's above analyses, we conducted a serial-multiple mediation analysis of Misinformation Accuracy Judgments and COVID-19 Threat in the relationship between Political Orientation and PHB controlling for PVD. Analyses were conducted with PROCESS (model 6; Hayes, 2012). The total effect of political orientation on PHB was significant (Figure 3a). As theorized, this effect was serially mediated by misinformation accuracy judgment and COVID-19 threat. The indirect pathway of the effect of political orientation on PHB via misinformation accuracy judgment and COVID-19 threat was significant,  $b = -.018$ ,  $SE = 0.001$ ,  $CI_{95} [-0.042, -0.002]$ . Notably, the direct effect of political orientation on PHB became nonsignificant when accounting for indirect effects.

We likewise conducted a serial-multiple mediation of misinformation accuracy judgment and COVID-19 disgust in the relationship between political orientation and PHB controlling for

PVD. The total effect of political orientation on PHB was significant (Figure 3b). Yet, this effect was not serially mediated by misinformation accuracy judgment and COVID-19 disgust. The indirect pathway of the effect of political orientation on PHB via misinformation accuracy judgment and COVID-19 threat was not significant,  $b = -.0005$ ,  $SE = 0.002$ ,  $CI_{95} [-0.005, 0.004]$ . Notably, the direct effect of political orientation on PHB remained significant when accounting for indirect effects.

### 3.3 | Discussion

The results of Study 1 were replicated: the association of political orientation with COVID-19 threat was stronger than with COVID-19 disgust. Further, the predicted serial mediation model supported our theory that stronger conservatism is associated with higher judgments of COVID-19 misinformation as accurate, which contributes to lower perceptions of COVID-19 threat and, in turn, less engagement in PHB. Notably, we do not detect a direct association between partisans' ability to distinguish misinformation from accurate information and PHB, rather subsequent perceptions of COVID-19 threat are essential in linking them. The model with misinformation accuracy judgments predicting perceptions of COVID-19 as disgusting was not explanatory in linking political orientation to PHB. This pattern of results underscores the role of COVID-19 threat perceptions, over and above disgust perceptions, as essential in understanding partisan differences in PHB.



**FIGURE 3** Serial-multiple mediation of COVID-19 misinformation accuracy judgments and COVID-19 (a) threat or (b) disgust in the relationship between political orientation and preventative health behavior controlling for PVD, with unstandardized beta values. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

## 4 | GENERAL DISCUSSION

Despite a link between PHB and better COVID-19 related health outcomes, adherence to PHB varies largely along political lines. The current work examined the relationship between informational factors, perceptions of COVID-19 threat and disgust, and PHB. In Study 1, higher conservatism (vs. liberalism) predicted perception of weaker COVID-19 threat. The relationship between political partisanship and threat accounted for the partisanship-disgust association, implying that (concerning COVID-19) threat more than disgust perception is driven by political orientation. Study 2 replicated and extended this finding by confirming a serial mediation model in which higher conservatism (vs. liberalism) predicted lower engagement in PHB via poor performance in judging the accuracy of dubious COVID-19 information and, in turn, perception of lower COVID-19 threat. Additionally, COVID-19 threat predicted PHB above and beyond the relationship between partisanship and PHB; on the contrary, COVID-19 disgust did not predict PHB beyond partisanship. Further, the relationship between threat and PHB held above PVD, implying that these results are COVID specific, and not a consequence of general disease vulnerability. Thus, these results clarify earlier work by showing that informational factors only affect partisan differences in adherence to PHB via theoretically downstream threat-perception. Consequently, considering *only* the role of informational factors or threat perception in predicting PHB is likely to inflate the influence of each; when those factors are considered in tandem, a more comprehensive account of PHB emerges via partisan-driven threat perception.

### 4.1 | The importance of threat perception

Much has been made of the effect of fake news and belief in misinformation on behavior. The idea is typically that believing misinformation to be accurate has a negative influence on people's behavior. While there is an association between people's own (presumed to be true) knowledge and behavior, knowledge is merely a partial representation of (and hence, partial contributor to) the summary attitude which manifests as an evaluation (Fazio & Zanna, 1978). In the current work, we focus on partisan evaluation of COVID-19 threat and its role in preventative health behavior (PHB). Our comprehensive model linking political partisanship to PHB through higher perceived accuracy of misinformation (i.e., incorrectly believing dubious information is true) and subsequent perceptions of COVID-19 threat suggest that belief in misinformation does not directly shape PHB (indeed, misinformation accuracy judgments *did not* directly predict PHB). Instead, partisan differences in the endorsement of fake news *only affect PHB through theoretically downstream perceptions of COVID-19 threat*. That is, the role of partisan-driven differences in accuracy judgments of misinformation presented in fake news on PHB is explained by partisan differences in threat perception.

Consider this specific insight in light of the idea that perceptions and evaluations shaped by knowledge are the most proximal

predictors of behavior (Fazio & Zanna, 1981). Given the uniquely powerful role of threat evaluation in shaping both nonconscious and conscious adaptive responses (March et al., 2017, 2018, 2022), threat perception may be particularly critical when considering outcomes ostensibly linked to self-protection. The current work indicates that perception of COVID-19 as a threat to physical harm or death uniquely predicts PHB. Other work has focused on the implications of perceptions of COVID-19 as damaging to financial or cultural wellbeing (Kachanoff et al., 2021). Given the theoretical and empirical primacy of physical threat in shaping downstream behavior as well as our result, we would expect that the effect of COVID-19 threat on PHB is primary to other perceptions of COVID-19 harm.

Additionally, our findings offer empirical support for recent skepticism on the relevance of the Behavioral Immune System (BIS) mechanisms to responses to modern day pandemics (i.e., Ackerman et al., 2021). Although prior work has found a relationship between disgust sensitivity and PHB, we find that threat but not disgust perceptions mediate the link between informational factors about COVID-19 and PHB. One possible reason for these divergent patterns is that prior work may have only operationalized disgust but not threat perceptions. Thus, what may have appeared to be disgust (i.e., what was captured by disgust measures) might have in fact been driven by threat. Operationalizing both, and controlling for the other in our mediation analyses, it appears that COVID-19 threat subsumes COVID-19 disgust. Considered in light of skepticism about the role of the BIS for responses to COVID, prototypical cues for BIS disgust responses (e.g., wounds, sores, rotting tissue) are likely not cues elicited by COVID-19 infection. Instead, our findings highlight the role of informational factors (e.g., the news) as cues for provoking adaptive responses to COVID-19 (e.g., perceiving it as physically threatening).

### 4.2 | Partisan and motivated influences on informational factors

Lowered COVID-19 threat perception contrasts with greater dispositional threat and disgust sensitivity among conservatives (Crawford, 2017; Smith et al., 2011; but see Bakker et al., 2020; Johnston & Madson, 2022;). The current findings, however, are consistent with work demonstrating that threat perception is affected by ingroup pressures and associated informational factors (Calvillo et al., 2020; Samore et al., 2021, 2022). We extend that idea by showing that partisan- and misinformation-driven reductions in threat perceptions have implications for COVID-19 PHB. Several informational processes may function in parallel to shape the uptake and integration of information that influences threat perception. Ingroup pressures may undermine accuracy goals by biasing how people interpret information (Van Bavel & Pereira, 2018) and partisans may selectively seek out or (dis)credit information that supports existing partisan beliefs (Kahan, 2017; Kunda, 1990). Framed in light of our findings, partisans may differentially perceive and endorse unique information due to an ingroup consensus



regarding COVID-19 related issues, leading to unique information uptake, which eventually affects perceptions of COVID-19 threat.

Alternatively, it has been suggested that greater ability to discern genuine from dubious partisan information is better predicted by increased dispositional cognitive sophistication (Pennycook & Rand, 2019). From this perspective, the degree to which one engages in cognitive reflection may influence endorsement of dubious information, such that more deliberative individuals are less susceptible to believing misinformation to be accurate. Considering our findings, it may be that partisans differentially engage in effortful thinking with regard to COVID-19, leading to unique beliefs which eventually affect perceptions of COVID-19 threat. Though beyond the scope of the current work, disentangling the unique roles of motivated and deliberative processes on partisan driven threat perception may shed light on means of combatting the deleterious effects of COVID-19 misinformation.

### 4.3 | Limitations and practical implications

Although vaccination is a now-quantifiable PHB, it was not included in our PHB measure nor measured separately in the current work.<sup>3</sup> Like other PHB, there is a partisan gap in vaccination rates (Kates et al. 2021); thus our findings underscore the need to combat misinformation related to efficacy (and perhaps the perceived threat) of vaccination. Several factors likely contribute to vaccine hesitancy, such as perception of vaccines as ineffective (or even harmful) and distrust of science and scientific institutions (which is typically greater among conservatives, Azevedo & Jost, 2021; J. R. Kerr & Wilson, 2021). Those beliefs may be driven by differential exposure to and belief in dubious information about the COVID-19 vaccine. Future work assessing partisan differences in vaccination should explore both informational factors and threat perceptions to provide a comprehensive understanding of the processes undermining health behaviors.

Additionally, future research could measure responses to actual disease cues as a more comprehensive measure of disgust. Self-report items probing for disgust of COVID-19, such as those used in the current work, might not fully capture disgust responses that people experience in response to COVID-19 pathogen cues such as coughing or sneezing. Future work measuring responses to such cues might provide a stronger test of the differential consequences of COVID-19 threat versus disgust.

Our studies were also limited by sample characteristics. Indeed, our sample consisted entirely of college-aged students, most of whom were White women. Accordingly, though our model elucidates the link between partisanship and PHB, this pattern may be more or less pronounced among individuals of different ages, genders, and racial and ethnic backgrounds (Henrich et al., 2010; Tan et al., 2021). For example, an older sample may be both more conservative and more vulnerable to the effects of COVID-19. It is also likely that other factors moderate the link between political orientation and PHB among non-White individuals. One possible determinant of PHB

more prevalent among non-White individuals is skepticism of the medical establishment (grounded in awareness of historical racial discrimination), which is shown to negatively impact COVID-19 vaccination rates in Black and other minority communities (Khubchandani & Macias, 2021; Momplaisir et al., 2021). Situated in our model, it could be that individuals from minoritized groups more strongly endorse dubious news to the extent that it is consistent with the idea that medical and government establishments are not truthful about the risks of COVID-19 or the vaccine. In sum, whether our patterns generalize to older as well as more gender and racially diverse population is subject to future work.

Last, future research might also consider the roles of both informational and perceptual factors in the link between political orientation and PHB to offer more granular insights on how to encourage PHB in ongoing and future pandemics. For example, educational interventions aimed at increasing vaccination via promoting accurate COVID-19 information (or debunking COVID-19 misinformation) might benefit from focusing specifically on threat-related misinformation. Recent work increased perceptions of COVID-19 threat and intentions to engage in PHB with an intervention that presented information about COVID-19 with an “agency” framing, which they expected to be particularly efficacious for conservatives (vs. liberals; Nowlan & Zane, 2022). Indeed, presenting information that COVID-19 “seeks to infect any human it comes in contact with” and that it has a “strong motive to use humans as a means to spread” versus more neutral language was particularly impactful for conservatives (vs. liberals).

## 5 | CONCLUSION

The current work investigated a mechanism by which engagement in PHB emerged as a political issue in the context of the COVID-19 pandemic. Across two studies, higher conservatism (vs. liberalism) predicted perceptions of COVID-19 as less threatening. The relationship between conservatism and PHB was mediated by higher accuracy judgments of misinformation about COVID-19 and subsequently lower perceived COVID-19 threat, but not disgust. Addressing the relationship between knowledge and threat is essential to understanding and, in future work, increasing adherence to PHB.

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

Data are available at the OSF repository associated with this study ([https://osf.io/8vmh5/?view\\_only=e9553363a63e45139b97a0b19e4a98dc](https://osf.io/8vmh5/?view_only=e9553363a63e45139b97a0b19e4a98dc)). Complete questionnaires are included in the Supporting Information.

### ORCID

Vincenzo J. Olivett  <http://orcid.org/0000-0003-2140-1703>

David S. March  <http://orcid.org/0000-0002-9874-7967>

## ENDNOTES

- <sup>1</sup> Note: A post hoc sensitivity analysis with alpha of .05, 80% power, a sample of 87, and 1 predictor indicates a minimum detectable  $R^2$  of .08 (an  $F^2$  of .09). The above  $R^2 = .05$  indicates Study 1 to be underpowered to robustly detect a relationship between political orientation and disgust ratings. This limitation is overcome in Study 2.
- <sup>2</sup> Note: Although Study 1 was underpowered to robustly detect a relationship between political orientation and disgust ratings, Study 2 was adequately powered. A post hoc sensitivity analysis with alpha of .05, 80% power, a sample of 168, and 1 predictor indicates a minimum detectable  $R^2$  of .05. The above  $R^2 = .08$  indicates Study 2 is adequately powered.
- <sup>3</sup> For the curious reader, we began this work before the release of the COVID-19 vaccine and so did not consider including it in our battery of preventative health behaviors.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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