



# Investigation of the predictive influence of personal and gubernatorial politics on COVID-19 related behaviors and beliefs

Michele Hiserodt<sup>1</sup> · Hayley E. Fitzgerald<sup>1</sup> · Jennifer Garcia<sup>1</sup> · Danielle L. Hoyt<sup>2</sup> · Megan A. Milligan<sup>1</sup> · Michael W. Otto<sup>1</sup>

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## Abstract

Given the varied emotional and behavioral responses to the COVID-19 pandemic across the United States, further attention to the personal and societal influences on such responses is necessary. We investigated the predictive influence of personal political affiliation and the congruity of personal and governor political affiliation on COVID-19 emotional and behavioral responses, with specific attention to the influence of intolerance of uncertainty (IU) on emotional response. These factors were assessed in two studies of adults in the United States ( $N=480$ ,  $N=272$ ). We utilized a series of hierarchical linear and logistic regressions to assess predictors of 4 outcomes: (1) trust in governor's response to the pandemic, (2) COVID-19 related worry, and the (3) usage and (4) perceived efficacy of protective health behaviors (e.g., wearing a mask). Across these studies, we found that IU predicted increased COVID-19 related worry. Further, age and personal political affiliation, but not concordance with governor affiliation, predicted COVID-19 behavioral responses. These findings are discussed in relation to the potential importance of linking health messaging to personal characteristics.

**Keywords** COVID-19 · Pandemic · Partisanship · Health behaviors · Governor · Worry

## Introduction

The novel coronavirus (COVID-19) outbreak was declared a pandemic by the World Health Organization in March 2020 (American Journal of Managed Care (AJMC) Staff, 2021). In 2020, COVID-19 became the third leading cause of death for adults in the United States (Ahmad et al., 2021). Prior to the development of a vaccine, community mitigation strategies (e.g., stay-at-home orders) and behavioral measures (e.g., wearing a mask) became health officials' best recommendations to control the transmission of COVID-19. Even with widespread vaccination campaigns, the presence of novel and highly transmissible COVID-19 variants and vaccine hesitancy among the public means behavioral mitigation strategies continue to be important to curtailing the

pandemic. Therefore, it is critical to better understand characteristics that influence individual emotional and behavioral responses to the COVID-19 pandemic. Specifically, we examined political affiliation at the state and individual level, the congruency of personal and governor political affiliation and intolerance of uncertainty.

In the absence of a uniform federal response in the United States, individual states were left to respond to public health recommendations at their own discretion. Preliminary evidence supports partisanship as a significant determinant in the initial state government response to COVID-19, such that a state's response likely reflected aspects of the majority party ideology. Liberal ideology tends to emphasize fairness, public health and safety whereas conservative ideology tends to emphasize tradition, authority and preserving social norms and values (Baccini & Brodeur, 2021; Jost et al., 2018). Echoing these ideological differences, Democratic governors were more likely to issue stay-at-home orders and do so quicker than their Republican counterparts and Republican governors were more likely to accelerate re-opening efforts following the implementation of such orders (Baccini & Brodeur, 2021; Gusmano et al., 2020).

✉ Michele Hiserodt  
mhiser@bu.edu

<sup>1</sup> Department of Psychological and Brain Sciences, Boston University, 900 Commonwealth Avenue, 2nd floor, Boston, MA 02215, USA

<sup>2</sup> Department of Psychology, Rutgers, The State University of New Jersey, 53 Avenue E, Piscataway, NJ 08854, USA

The matching effect provides a framework for understanding how and why individuals may or may not adhere to behavioral recommendations from state government officials; the matching effect posits appeals are most persuasive when some characteristic of the message is personalized, or matched, to the recipient (Teeny et al., 2021). For example, the effectiveness of an appeal is enhanced when the source or content of the message aligns with the recipient's political affiliation and values (Teeny et al., 2021). Thus, the task of understanding individual differences in health recommendation compliance and related attitudes during the COVID-19 pandemic must take into account the alignment of state government messaging with individual political partisanship.

The source of COVID-19-related instruction may also effect health behavior compliance. In line with the matching effect, individuals report significantly higher levels of trust in governors of the same political party than those of the opposite; that is, Democrats report significantly more trust in Democrat governors than Republican governors (Kerr et al., 2021). Evidence from previous health crises suggests that individuals are more likely to adopt behavioral health recommendations when they have a higher general trust in government (Rubin et al., 2009) and specifically in government agencies' ability to effectively control the crisis (Tang & Wong, 2003). More generally, evidence suggests individuals, regardless of political party, are significantly more likely to demonstrate favoritism towards the rhetoric of their co-partisans (Lelkes & Westwood, 2016).

Partisan influences are reflected by COVID-19-related attitudes and health behaviors. According to polling data from mid-March 2020, 38% of Fox News viewers, a conservative-leaning media source, were worried about COVID-19, compared to 71% of CNN viewers, a liberal-leaning media source (Motta et al., 2020). Similarly, conservatives report a significantly lower perceived COVID-19 risk than liberals (Kerr et al., 2021). With respect to health behaviors, Democrats were more likely to practice social distancing and endorsed using more protective health behaviors than Republicans (Kerr et al., 2021; Pederson & Favero, 2020). Democratic partisanship was indirectly associated with social distancing compliance through greater concern about and perceived risk toward COVID-19 (Pedersen & Favero, 2020). Fear appeal theories suggest that appraisal of threat is an important driver in behavioral response: when a threat is deemed personally significant or relevant, there is an increased behavioral drive to respond (Witte & Allen, 2000). Thus, the partisan divide in COVID-19 threat appraisal, along with the matching effect, may explain individual differences in behavioral responses, specifically compliance with protective behaviors.

Finally, the mixed messages about COVID-19 risk level, infection methods, and behavioral response recommendations, and the evolving landscape of empirical findings on

COVID-19 morbidity and mortality (Motta et al., 2020; AJMC Staff, 2021) create a fraught environment for those with higher intolerance of uncertainty (IU): individuals who have difficulty tolerating the unknown and a tendency to perceive uncertain events as more threatening or worrisome (Rosser, 2019). During the H1N1 outbreak, for example, individuals with a greater IU had greater H1N1-related anxiety and worry (Taha et al., 2014). Similarly, a global sample of adults from March 2020 found that IU was associated with an increased fear of COVID-19 (Mertens et al., 2020). Lalot and colleagues (2020) found that subjective uncertainty and political trust interactively influence perceived threat, and found that high political trust ameliorated the relationship between uncertainty specific to COVID-19 and COVID-19 related threat and worry. With respect to political partisanship, it has been suggested that IU is a characteristic more commonly associated with politically conservative individuals, such as those affiliated with the Republican party (Jost et al., 2007).

Given this literature and theoretical considerations, an examination of the individual differences in emotional and behavioral responses to COVID-19 should acknowledge the alignment of state government messaging with personal partisanship as well as the ability to tolerate conflicting and uncertain information (i.e., IU). Although the influence of political orientation on COVID-19-related health behaviors, both generally (modifying behavior in response to the pandemic; Franz & Dhanani, 2021) and specifically (vaccine willingness; Milligan et al., 2021), and on state COVID-19 policy (de Bruin et al., 2020) has been investigated, specific attention to the influence of the congruity of personal and state political affiliation and IU is lacking. Thus, the goal for the present study was to fill this gap by evaluating whether personal political party affiliation and the concordance of personal political party with state (governor) political party would predict COVID-19-related outcomes, and whether these relationships would be influenced by IU. We assessed the association between these variables and COVID-19 attitudes and protective health behaviors in two independent surveys at different timepoints during the pandemic to address issues of non-replication and increase confidence in the potentially complex predictive relationship between these variables (Moonesinghe et al., 2007; Simons, 2014). We evaluated the following hypotheses:

- 1:** Political party concordance will offer significant prediction of trust in one's resident state government official's response to COVID-19, such that individuals who identify with the same political party as their governor will have the highest trust in state official's response to COVID-19.
- 2:** Personal political party and political party concordance will offer significant prediction of COVID-19 related

worry, such that individuals identifying as Democratic and individuals who identify with the opposite political party as their governor (discordant) will have the highest COVID-19 related worry.

**2a:** IU will offer significant prediction of COVID-19-related worry and this association will be moderated by governor political party concordance, such that individuals with greater IU will have higher COVID-19 related worry and this effect of IU on COVID-19 related worry will only be significant for individuals who identify with the opposite political party as their governor (discordant).

**3:** Personal political party will predict lower odds and lower perceived efficacy of the primary protective health behavior: mask wearing. This association will be moderated by political party concordance, such that the effect of individual political party on mask wearing and its perceived efficacy will only be significant for Republican individuals living in states with Republican governors (political party concordance). We hypothesize the same patterns for usage and perceived efficacy of the following secondary protective health behaviors: using hand sanitizer, avoiding travelling, and avoiding crowded places.

## Methods

### Participants

We conducted two cross-sectional nationwide online surveys at two independent timepoints: (1) study 1 from April 18th to May 30th, 2020, and (2) study 2 from July 18th to August 10th, 2020. Participants were recruited through Amazon's Mechanical Turk (MTurk) platform to complete an online survey. Interested participants who met eligibility criteria (self-report of 18 years of age or older, currently residing in the United States, and ability to read English and provide informed consent) were electronically consented prior to beginning the survey. Participants were compensated \$0.52 for survey completion; evidence suggests data quality is unaffected by payment on MTurk, even at low compensation rates (Buhrmester et al., 2011).

The study 1 sample ( $N=480$ ) reported a mean age of 34.8 years ( $SD=11.82$ , range = 18–76), with 41.9% identifying as female. The study 2 sample ( $N=257$ ) reported a mean age of 35.8 years ( $SD=12.24$ , range = 18–70), with 38.5% identifying as female. Approximately 47.7% of participants ( $n=229$ ) in study 1 and 43.2% of participants ( $n=111$ ) in study 2 reported minority racial or ethnic status (see Table 1 for breakdown by racial category).

We utilized MTurk for recruitment because the aims of the present study required a national sample. Importantly,

evaluations of MTurk suggests the platform yields demographically diverse samples more representative of noncollege populations and the quality of data meets psychometric standards of published data (Buhrmester et al., 2011). Forty-seven states and 41 states out of a total of 51 (District of Columbia was included as an independent option) were represented in the study 1 sample and study 2 sample, respectively. Two states – Nebraska and New Hampshire – were not represented in either sample.

### Procedure

Participants completed a range of online questionnaires assessing demographics, cognitive traits, and behaviors and attitudes related to the COVID-19 pandemic administered via Qualtrics. Responses with less than 75% of the survey complete ( $n_{Study 1} = 4$ ;  $n_{Study 2} = 2$ ) and those that failed quality assurance questions (e.g., “Which of the following words is a color?”;  $n_{Study 1} = 118$ ;  $n_{Study 2} = 91$ ) were excluded pre-compensation. Participants with patterned responses (e.g., toggling perfectly between two response options for consecutive measures) were excluded from all analyses ( $n_{Study 1} = 15$ ;  $n_{Study 2} = 25$ ). Participants who completed the survey at both timepoint 1 and timepoint 2 ( $n = 15$ ) were excluded from the study 2 sample only. Only participants with complete data across relevant variables were included in analyses, therefore sample sizes vary depending on completeness across variables under investigation.

Following May 30th, 2020, the COVID-19 pandemic developed in unanticipated ways: the United States passed 3 million COVID-19 infections, experimental trials of treatments (i.e., hydroxychloroquine) ceased, state reopening plans for the summer were halted or reversed, and the mandated reporting protocol for hospitals was changed – prompting discussions about the integrity and transparency of COVID-19 related data (AJMC Staff, 2021). Perhaps most importantly, evidence suggests that states with Democratic governors were hardest hit initially by the COVID-19 pandemic, but states with Republican governors had, on average, more positive tests by May 30th, more COVID-19 cases by June 3rd, and more COVID-19 deaths by July 4th compared to Democrat-led states (Neelon et al., 2021). For these reasons, we decided to investigate the constructs from timepoint 1 again at timepoint 2 with an independent replication design.

The study protocol was approved by the Institutional Review Board at Boston University. The current study was preregistered in 2021 after data collection was complete and is available online at Open Science Framework (<https://doi.org/10.17605/OSF.IO/6F7VZ>).

**Table 1** Demographic characteristics and outcomes

	Study 1 (N=480)	Study 2 (N=257)
	M (SD)	M (SD)
Age	34.80 (11.82)	35.75 (12.24)
Trust <sup>a</sup>	4.52 (1.37)	3.83 (1.48)
Worry <sup>b</sup>	55.66 (18.87)	56.79 (17.26)
IU <sup>c</sup>	38.42 (9.42)	38.95 (9.71)
Perceived efficacy of behavior		
Wearing a mask	2.60 (0.77)	2.74 (0.71)
Using hand sanitizer	2.63 (0.78)	2.73 (0.65)
Avoiding crowded places	2.50 (0.84)	2.39 (0.91)
Avoiding travelling	2.06 (1.05)	1.76 (1.11)
	Frequency (%)	Frequency (%)
Gender identity		
Female	201 (41.9%)	99 (38.5%)
Male	276 (57.5%)	158 (61.5%)
Other	3 (0.6%)	0 (0%)
Race		
Alaska Native or American Indian	13 (2.7%)	8 (3.1%)
Asian	73 (15.2%)	15 (5.8%)
Black or African American	53 (11.0%)	31 (12.1%)
Native Hawaiian/Other Pacific Islander	3 (0.6%)	0 (0%)
White	322 (67.1%)	197 (76.7%)
Other/Decline to state	16 (3.3%)	6 (2.3%)
Personal political party		
Democrat	189 (39.4%)	111 (43.2%)
Republican	170 (35.4%)	106 (41.2%)
Independent	76 (15.8%)	25 (9.7%)
Other/Not registered	45 (9.4%)	15 (5.8%)
Behavior usage		
Wearing a mask	371 (77.5%)	228 (88.7%)
Using hand sanitizer	392 (81.8%)	207 (80.5%)
Avoiding crowded places	352 (73.5%)	160 (62.3%)
Avoiding travelling	301 (62.8%)	130 (50.6%)

<sup>a</sup>Trust = Trust in State Official's Response to COVID-19; <sup>b</sup>Worry = COVID-19 Worry Index (total score); <sup>c</sup>IU = Intolerance of Uncertainty (total score)

## Measures

### Demographics

Information on participant gender, age, and personal political party affiliation was collected. Participants reported their current state of residence which was cross-referenced with the political party of the governor in that state at the time of survey completion to create a governor political party variable. Governor political party categories were 'Republican' or 'Democrat.' Regarding personal political party affiliation, participants were asked "What political party are you registered under?" Response options were: 'I am not registered under a political party,' 'Democrat,' 'Republican,' 'Independent,' and 'Other (write-in).' For the

current study, because congruency with governor political party was of interest and all U.S. governors are members of either the Democratic or Republican party at time of survey completion, only participants who endorsed 'Democrat' or 'Republican' were included ( $n_{Study 1} = 121$ ,  $n_{Study 2} = 43$  were removed prior to analyses due to this coding).

### Perception of State Official's Response to COVID-19

To assess participants' trust in their state government official's response to the COVID-19 pandemic, participants were asked to respond to a single item: "My State Political Official's portrayal of Coronavirus/COVID-19 is a..." Responses were assessed on a 7-point Likert scale (1 = significant underreaction of my state official to the pandemic's

severity, 4 = appropriate reaction, 7 = significant overreaction of my state official to the pandemic's severity).

### COVID-19 Related Worry

The COVID-19 Worry Index (Buckner et al., 2021) was used to assess participants' worry specifically related to COVID-19. Participants were asked to rate how worried they feel in response to 15 statements (e.g., "I worry that I am going to contract COVID-19/Coronavirus, I am worried that if I leave the house, I will contract COVID-19"). Responses were assessed on a scale from 1 ("not at all") to 7 ("a great deal"). All items were summed, with higher scores indicating greater COVID-19 related worry. The measure demonstrated strong internal consistency across both studies (Cronbach's  $\alpha = 0.911-0.926$ ).

### Intolerance of Uncertainty

The Intolerance of Uncertainty – Short Form (Carleton et al., 2007) is a 12-item self-report questionnaire designed to assess responses to unpredictable situations, the future, and the general unknown (e.g., "I can't stand being taken by surprise; When I am uncertain, I can't function very well"). Items are rated on a scale from 1 ("not at all characteristic of me") to 5 ("entirely characteristic of me"). All items were summed, with higher scores reflecting a greater intolerance of uncertainty. The measure demonstrated strong internal consistency across both studies (Cronbach's  $\alpha = 0.886-0.903$ ).

### COVID-19 Protective Health Behaviors

COVID-19 specific protective health behavior usage was assessed by asking participants to select, from a list of relevant protective behaviors, all of the health behaviors they have used in response to the COVID-19 outbreak. Response options were "yes, I have used" or "no, I have not used." The perceived efficacy of protective health behaviors was assessed by asking participants to indicate how effective they believed the same list of behaviors were in response to the COVID-19 outbreak. Response options were "very effective," "slightly effective," "not effective," or "unsure." The usage and perceived efficacy of four behaviors were included in the present study as outcomes in regression models: wearing a mask, using hand sanitizer, avoiding travelling, and avoiding crowded places.

### Analytic Plan

All analyses were conducted using SPSS version 27. Descriptive statistics (frequencies, proportions or mean, SD) were computed for primary variables of interest (personal

political party, governor political party, COVID-19 related worry, IU, usage of protective behavior by type and perceived efficacy of protective behavior by type). Preliminary analyses were conducted to assess the zero-order associations among predictor, covariate, and outcome variables.

A series of regressions were used to examine the predictive role of personal and governor political party affiliation, and the potential role of the interaction between the two, on the following outcomes: trust in state official's response to COVID-19, COVID-19 related worry, usage of protective health behaviors and perceived efficacy of protective health behaviors (by type). All continuous variables included were mean-centered. In all models, demographic (age and gender) covariates were included in the initial step, followed by the main effects of personal political party and governor political party in the second step and the interaction of personal political party and governor political party in the third step. Further, we examined the predictive role of IU, in addition to the main effects of personal and governor political party, on COVID-19 related worry only. To investigate the potential moderating role of IU on the relationship between personal and governor political party, two-way and three-way interaction terms were included in the third step of this model. The primary protective health behavior under investigation was mask wearing. Additionally, the same usage and perceived efficacy models were evaluated at Bonferroni-adjusted values (0.05/3) for the following secondary protective health behaviors: using hand sanitizer, avoiding travelling, and avoiding crowded places.

## Results

Demographic information and characteristics specific to COVID-19 health behaviors are presented in Table 1. After descriptive statistics of the primary variables of interest were evaluated, a series of analyses (independent sample t-tests and chi-square test of independence) were performed to assess for significant differences in predictor and outcome variables between study timepoints. There was a significant difference ( $t(734) = 6.304, p < .001$ ) between the mean perception of one's state official's response to the pandemic, such that participants in study 2 ( $M = 3.83, SD = 1.48$ ) perceived their state official's response to be significantly more of an underreaction compared to participants in study 1 ( $M = 4.52, SD = 1.37$ ). With respect to protective health behaviors, wearing a mask was perceived as significantly more effective in the study 2 sample ( $M = 2.742, SD = 0.708$ ) compared to the study 1 sample ( $M = 2.601, SD = 0.767$ ;  $t(681) = -2.358, p = .019$ ). Similarly, participants in the study 2 sample (88.7%) were more likely to have reported wearing a mask compared to the study 1 sample (77.5%;  $X^2(1, N = 736) = 14.006, p < .001$ ). Significantly fewer participants

reported avoiding crowded places in study 2 (62.3%) compared to study 1 (73.5%;  $X^2(1, N = 736) = 9.962, p = .002$ ). Similarly, significantly fewer participants reported avoiding travelling in study 2 (50.6%) compared to study 1 (62.8%;  $X^2(1, N = 736) = 10.352, p = .001$ ). Avoiding travelling was perceived as significantly more effective in the study 1 sample ( $M = 2.059, SD = 1.048$ ) compared to the study 2 sample ( $M = 1.758, SD = 1.109; t(655) = 3.406, p < .001$ ). All other comparisons of predictor and outcome variables between study timepoints were non-significant ( $p = .099$  to  $0.668$ ).

**Regression Models**

Table 2 presents the results of the hierarchical linear regression for the outcome of trust in state official’s response to

COVID-19 in which the main and interactive effects of personal and governor political party were investigated (hypothesis 1). In study 1 only, age ( $\beta = 0.112, t(347) = 2.136, p < .05$ ) was identified as a significant predictor, such that the perception that one’s state official’s response to COVID-19 was an overreaction grew with individual’s age. Personal political party was a significant predictor in both study 1 ( $\Delta R^2 = 0.029, \beta = 0.178, t(347) = 3.380, p < .001$ ) and study 2 ( $\Delta R^2 = 0.031, \beta = 0.198, t(210) = 2.765, p < .05$ ), with Republicans perceiving their state official’s response to COVID-19 as significantly more of an overreaction. All other predictors and interactions in the models were non-significant ( $p_{Study 1} = 0.108$  to  $0.566, p_{Study 2} = 0.101$  to  $0.911$ ).

Table 3 presents the hierarchical linear regressions for the outcome of COVID-19 related worry in which the main

**Table 2** Hierarchical linear regression for the outcome of trust in state official’s response to COVID-19

Predictor	Study 1 (n=353)			Study 2 (n=216)		
	$\beta$	t	p	$\beta$	t	p
Gender	0.112	2.136	<b>0.033</b>	-0.008	-0.112	0.911
Age	-0.030	-0.575	0.566	-0.067	-0.975	0.331
PPP <sup>a</sup>	0.178	3.380	<b>0.001</b>	0.198	2.765	<b>0.006</b>
GPP <sup>b</sup>	-0.085	-1.612	0.108	-0.111	-1.645	0.101
PPP <sup>a</sup> X GPP <sup>b</sup>	0.036	0.678	0.498	0.047	0.667	0.506

Only the final step of the model is included because no predictors drop from significance between steps. Significant (bolded) at the  $p < .05$  level.

<sup>a</sup>PPP = Personal political party orientation; <sup>b</sup>GPP = Governor political party orientation

**Table 3** Hierarchical linear regression for the outcome of COVID-19-related worry

Predictor	Study 1 (n=346)			Study 2 (n=214)		
	$\beta$	t	p	$\beta$	t	p
<b>Model 1</b>						
Gender	0.011	0.204	0.838	-0.051	-0.743	0.458
Age	-0.186	-3.443	<b>0.001</b>	-0.010	-0.142	0.887
PPP <sup>a</sup>	0.008	0.150	0.880	-0.102	-1.416	0.158
GPP <sup>b</sup>	-0.012	-0.227	0.821	-0.145	-2.128	<b>0.035</b>
PPP <sup>a</sup> X GPP <sup>b</sup>	-0.053	-0.977	0.329	-0.117	-1.653	0.100
<b>Model 2</b>						
Gender	0.002	0.042	0.966	-0.086	-1.305	0.194
Age	-0.115	-2.235	<b>0.026</b>	0.024	0.357	0.721
IU <sup>c</sup>	0.369	7.121	<b>&lt;0.001</b>	0.303	4.522	<b>&lt;0.001</b>
PPP <sup>a</sup>	-0.007	-0.141	0.888	-0.128	-1.843	0.067
GPP <sup>b</sup>	-0.010	-0.210	0.834	-0.114	-1.734	0.084
PPP <sup>a</sup> X GPP <sup>b</sup>	-0.047	-0.926	0.355	-0.111	-1.627	0.105
PPP <sup>a</sup> X IU <sup>c</sup>	0.006	0.116	0.908	0.068	1.012	0.313
GPP <sup>b</sup> X IU <sup>c</sup>	-0.076	-1.480	0.140	0.084	1.274	0.204
PPP <sup>a</sup> X GPP <sup>b</sup> X IU <sup>c</sup>	0.034	0.670	0.503	-0.077	-1.151	0.251

Only the final step of the models are included because no predictors drop from significance between steps. Model 1 refers to H2. Model 2 refers to H2a. Significant (bolded) at the  $p < .05$  level.

<sup>a</sup>PPP = Personal political party orientation; <sup>b</sup>GPP = Governor political party orientation; <sup>c</sup>IU = Intolerance of Uncertainty (total score)

and interactive effects of personal and governor political party and IU were investigated. In the model evaluating hypothesis 2, no variables were found to be consistently significant predictors across study 1 and study 2. In study 1, age ( $\beta = -0.186, t(340) = -3.443, p < .001$ ) was a significant predictor of COVID-19 related worry, with older individuals worrying less. In study 2, governor political party ( $\beta = -0.145, t(208) = -2.128, p = .035$ ) was a significant predictor, with individuals living in states with Democratic governors reporting greater COVID-19 related worry. In the model evaluating COVID-19 related worry with IU included in the second step, IU was identified as a significant predictor of COVID-19 related worry in both study 1 ( $\Delta R^2 = 0.143, \beta = 0.369, t(335) = 7.121, p < .001$ ) and study 2 ( $\Delta R^2 = 0.086, \beta = 0.303, t(204) = 4.522, p < .001$ ), such that higher IU predicted higher COVID-19 related worry. In study 1, age ( $\beta = -0.115, t(335) = -2.235, p = .026$ ) maintained its significance as a predictor of COVID-19 related worry at this step, with older individuals worrying less. All other predictors and interactions in the models were non-significant ( $p_{\text{Study 1}} = 0.140$  to  $0.908, p_{\text{Study 2}} = 0.067$  to  $0.721$ ).

Table 4 (hypothesis 3) presents the logistic regression for the primary protective health behavior under investigation: the likelihood of wearing a mask. There were no significant predictors identified in the model ( $p_{\text{Study 1}} = 0.094$  to  $0.777, p_{\text{Study 2}} = 0.055$  to  $0.976$ ). However, in both studies, personal political party was trending towards significance ( $p_{\text{Study 1}} =$

$0.094, p_{\text{Study 2}} = 0.055$ ). For usage of the secondary behaviors under investigation (see supplementary material), gender ( $OR = 0.722, 95\% CI: 0.574$  to  $0.909$ ) was a significant predictor of the likelihood of avoiding travelling, such that females in study 1 only were more likely to avoid travelling. In study 2 only, age was a significant predictor of avoiding travelling ( $OR = 1.041, 95\% CI: 1.017$  to  $1.066$ ) and avoiding crowded places ( $OR = 1.043, 95\% CI: 1.016$  to  $1.070$ ), with older individuals more likely to endorse both behaviors. Age was trending towards significance in the same direction for the likelihood of avoiding crowded places in study 1. In study 2, personal political party (Democrat) ( $OR = 0.613, 95\% CI: 0.440$  to  $0.854$ ) significantly predicted greater likelihood of avoiding crowded places. The interaction between personal and governor political party ( $OR = 0.575, 95\% CI: 0.415$  to  $0.795$ ) was also significant in this study, such that individuals whose personal political orientation was opposite that of their governor's were more likely to avoid crowded places.

Table 5 (hypothesis 3) presents the hierarchical linear regression for the outcome of perceived efficacy of mask wearing. There were no predictors that emerged as consistently significant across both studies for this outcome. However, personal political party (Democrat) was identified as a significant predictor of higher perceived efficacy of mask wearing in study 1 ( $\beta = -0.117, t(317) = -2.084, p = .038$ ). With respect to the secondary protective behaviors under

**Table 4** Logistic regression for the outcome of protective behavior usage – Wearing a mask

Predictor	Study 1 (n = 352)				Study 2 (n = 216)			
	B	Wald	OR	p	B	Wald	OR	p
Gender	-0.037	0.081	0.964	0.777	-0.409	2.359	0.664	0.125
Age	-0.016	2.451	0.984	0.117	-0.006	0.113	0.994	0.737
PPP <sup>a</sup>	-0.220	2.803	0.802	0.094	-0.466	3.681	0.628	0.055
GPP <sup>b</sup>	0.142	1.152	1.152	0.283	-0.229	0.904	0.796	0.342
PPP <sup>a</sup> X GPP <sup>b</sup>	-0.128	0.925	0.880	0.336	-0.007	0.001	0.993	0.976

Only the final step of the model is included because no predictors drop from significance between steps. Significant at the  $p < .05$  level.

<sup>a</sup>PPP = Personal political party orientation; <sup>b</sup>GPP = Governor political party orientation

**Table 5** Hierarchical linear regression for the outcome of perceived efficacy of protective behavior – Wearing a mask

Predictor	Study 1 (n = 323)			Study 2 (n = 202)		
	$\beta$	t	p	$\beta$	t	p
Gender	-0.018	-0.318	0.751	0.074	1.040	0.300
Age	-0.104	-1.853	0.065	0.061	0.846	0.398
PPP <sup>a</sup>	-0.117	-2.084	<b>0.038</b>	-0.116	-1.559	0.121
GPP <sup>b</sup>	-0.028	-0.495	0.621	0.008	0.118	0.906
PPP <sup>a</sup> X GPP <sup>b</sup>	-0.056	-0.994	0.321	0.048	0.647	0.518

Only the final step of the model is included because no predictors drop from significance between steps. Significant (bolded) at the  $p < .05$  level.

<sup>a</sup>PPP = Personal political party orientation; <sup>b</sup>GPP = Governor political party orientation

investigation (see supplementary material), personal political party (Democrat) was identified as a significant predictor of greater perceived efficacy of using hand sanitizer in study 1 ( $\beta = -0.145$ ,  $t(320) = -2.609$ ,  $p = .009$ ), as a significant predictor of higher perceived efficacy of avoiding travelling in study 2 ( $\beta = -0.195$ ,  $t(180) = -2.521$ ,  $p = .013$ ; trending towards significance in study 1 [ $p_{\text{Study 1}} = 0.079$ ]), and as a significant predictor of greater perceived efficacy of avoiding crowded places in study 2 ( $\beta = -0.226$ ,  $t(180) = -3.020$ ,  $p = .003$ ; weakly trending towards significance in study 1 [ $p_{\text{Study 1}} = 0.077$ ]).

## Discussion

In the current study, we investigated the influence of personal and governor political party, and their concordance, on COVID-19 related emotional and behavioral responses. We found that personal political party alone significantly predicted perception of state official's response to the COVID-19 pandemic, such that identification as a Republican was associated with the perception that one's state official's response to the COVID-19 pandemic was more of an overreaction. Contrary to our hypothesis, the political party of one's state official did not have a significant main or interactive effect in this relationship. Interestingly, there was a significant difference between the mean perception of one's state official's response to the pandemic between study 1 and study 2, regardless of personal political orientation. On average, the perception that one's governor's response to the pandemic was an underreaction grew over time (between study 1 conducted April 18th to May 30th, 2020 to study 2, conducted July 18th to August 10th, 2020). This may be due to the progression of the pandemic and the evolving response by state governments. By July 2020, there were more than 3 million reported COVID-19 infections in the United States, with several states reporting single day records for new cases (AJMC Staff, 2021). During the same period, despite spikes in infection numbers, some states were beginning to lift restrictions and reopen public spaces, whereas others announced plans to postpone or reverse reopening efforts.

With respect to COVID-19 related worry, we found partial support for hypothesis 2a. The average COVID-19 related worry total score did not significantly differ between study 1 and study 2. Although there was no consistent significant main effect of either personal or governor political party across studies, IU did predict significantly greater COVID-19 related worry in both study 1 and study 2. This finding of the unique importance of IU to virus-specific anxiety is in line with findings from prior (Taha et al., 2014) and the COVID-19 (Taylor et al., 2020) pandemics. Although epidemiological indicators are

frequently used to illustrate the impact of the COVID-19 pandemic (i.e., infection rates, deaths), our findings suggest that the psychological impact of the pandemic is likely to be persistent, independent of political orientation, and associated with preexisting cognitive traits, including IU and anxiety sensitivity (Buckner et al., 2021).

Whereas we failed to find support for hypothesis 3 investigating the interactive influence of personal and governor political party on the usage and perceived efficacy of protective health behaviors, some interesting trends did emerge. There were significant differences in the usage and perceived efficacy of most of the protective health behaviors under investigation between study 1 (conducted April 18th to May 30th, 2020) and study 2 (conducted July 18th to August 10th, 2020). The study 2 sample was significantly more likely to endorse wearing a mask and perceived the behavior as significantly more efficacious compared to the study 1 sample. Personally identifying as a Democrat was trending towards significance in its prediction of greater likelihood of wearing a mask in both studies. Regarding perceived efficacy, personal political party was significant at study 1 only, such that Democrats perceived wearing a mask as more efficacious than Republicans did; perhaps the significant increase in the perceived efficacy of mask wearing overall in study 2 diluted the influence of personal political party in the sample.

In general, avoiding travelling was perceived as significantly more effective at study 2 compared to study (1) Following the significant increase in perceived efficacy of avoidance of travelling at study 2, both age and personal political party emerged as significant predictors only in study 2, such that older individuals and Democrats perceived avoiding travelling as more efficacious. Transitioning from perceived efficacy to actual behavior, the study 1 sample was significantly more likely to endorse avoiding travelling and avoiding crowded places compared to study (2) Again, following the significant shift in frequency of these avoidance behaviors, several predictors emerged as significant. Age was significant in its prediction of both behaviors at study 2, such that older individuals were more likely to endorse avoiding travelling and avoiding crowded places. Out of the 27 states that had travel restrictions issued by state officials at the time of study 1 data collection, 25 states had rescinded them and the majority of states had reopened public spaces, such as retail stores, restaurants and bars, gyms, and event spaces by the time study 2 was conducted (National Academy for State Health Policy, n.d.) Not surprisingly, when state mandates existed broadly to enforce the avoidance of travelling and crowded places, individuals were significantly more likely to engage in this avoidance. Interestingly, the significant increase in perceived efficacy of these avoidance behaviors coincided with the time period where they became voluntary, rather than compulsory, for many individuals.



Republicans were more likely to perceive their state official's response to the COVID-19 pandemic as an overreaction (regardless of state governor political orientation), were less likely to endorse protective health behaviors, and were less likely to perceive such behaviors as efficacious. These trends from the current study align with evidence that orientation with the Republican party was associated with reduced endorsement of protective health behaviors and reduced responsiveness to stay-at-home recommendations during the pandemic (Rabin & Dutra, 2021; Grossman et al., 2020). State governor political orientation failed to reach significance consistently in prediction of any of the above outcomes. Using data collected during the COVID-19 pandemic, Grossman and colleagues (Grossman et al., 2020) reported an interactive effect of personal political orientation and state governor political orientation on responsiveness to COVID-19-related behavioral recommendations: the effect of governors' recommendations to voluntarily stay at home and limit travel (prior to issuance of mandates) was strongest in Democratic-leaning counties with Republican governors. In line with this finding, we reported a significant main effect and interactive effect of personal and governor political party orientation, such that Democratic individuals and those individuals whose political orientation is opposite their governor (e.g., Democrats in Republican-led states) were significantly more likely to avoid crowded places. Importantly, this interaction was significant at study 2 only when many states had rescinded stay-at-home orders and reopened large public spaces. Avoidance of crowded places at that time was more likely to be voluntary, rather than mandated, compared to study 1. Hence, the influence of the timing, content and framing (e.g., voluntary vs. mandated) of protective health behavior messaging may add additional nuance to the relationship between personal and governor political orientation and behavioral reactions. Future investigations of individual differences in emotional and behavioral responses to the COVID-19 pandemic, or other future pandemics, should consider the influence of such factors alongside the relationship between personal and state official political orientation.

This study has several limitations. The response of governors to the COVID-19 pandemic was somewhat heterogeneous despite the significant party trends, with some governors breaking from their national party's norms (e.g., Massachusetts). All measures were self-reported and thus, any misrepresentation of one's protective health behaviors may impact the relationships of other variables with those behaviors. With respect to the non-significant results in the present studies, it is possible that the influence of partisanship on COVID-19 health behaviors is more complex than originally hypothesized and includes other emotional and cognitive factors, such as beliefs in conspiracy theories (Farias & Pilati, 2021).

The present study highlights the particular influence of personal political party orientation on COVID-19-related behaviors. This finding underscores the importance of health messaging matching to personal characteristics, in this case political party affiliation, regardless of one's broader political environment. COVID-19-related public health interventions should aim to leverage this partisan difference by personalizing messages to maximize persuasive appeal along political bias lines and dispatching them at community or local (micro) levels to minimize the influence of heterogeneity within political parties across regions (Matthews, et al., 2017). Further, the present study reported significant differences in the usage and perceived efficacy of select health behaviors between study 1 and study 2, such that, on average, the perception that protective health behaviors were efficacious grew over time, while the likelihood of engagement with such behaviors reduced. COVID-19-related public health interventions should also aim to reduce this discrepancy between attitude and action with respect to protective health behaviors. Importantly, despite the influence of personal political orientation on COVID-19 behavioral responses, political orientation does not exert the same influence on COVID-19 related worry. Thus, public psychological health interventions are unlikely to successfully utilize partisanship when addressing COVID-19 related mental health concerns and should consider malleable cognitive characteristics, such as IU.

**Authors' Contributions** Michele Hiserodt: Conceptualization, Methodology, Investigation, Formal analysis, Writing- original draft preparation; Hayley Fitzgerald: Investigation, Writing- Review & editing; Jennifer Garcia: Data curation, Writing- Review & editing; Danielle Hoyt: Investigation, Data curation, Writing- Review & editing; Megan Milligan: Investigation, Data curation, Writing- Review & editing; Michael W. Otto: Writing- Review & editing, Supervision.

**Data Availability** The data that support the findings of this study are available from the corresponding author upon request.

## Declarations

**Competing Interests** Although no competing interests are evident for the content of this manuscript, in the interest of full disclosure, the authors would like to acknowledge the following relationship. Dr. Otto receives compensation as a consultant for Big Health. No other authors have relevant financial or non-financial interests to report.

**Ethics Approval** Approval for the study was obtained from the Institutional Review Board of Boston University- Charles River Campus. The procedures used in this study adhere to the principles of the Declaration of Helsinki.

**Consent to Participate** Informed consent was obtained from all individual participants included in this study.

## References

- Ahmad, F. B., Cisewski, J. A., Minino, A., & Anderson, R. N. (2021). Provisional mortality data – United States, 2020. *The Morbidity and Mortality Weekly Report*, *70*, 519–522. <https://doi.org/10.15585/mmwr.mm7014e1externalicon>
- American Journal of Managed Care (AJMC) Staff (2021). *A Timeline of COVID-19 Developments in 2020*. AJMC. <https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020>. Accessed 25 June 2021
- Baccini, L., & Brodeur, A. (2021). Explaining governors' response to the COVID-19 pandemic in the United States. *American Politics Research*, *49*(2), 215–220. <https://doi.org/10.1177/1532673X20973453>
- de Bruine, W., Saw, H. W., & Goldman, D. P. (2020). Political polarization in US residents' COVID-19 risk perceptions, policy preferences, and protective behaviors. *Journal of Risk and Uncertainty*, 1–18. <https://doi.org/10.1007/s11166-020-09336-3>
- Buckner, J. D., Abarno, C. N., Lewis, E. M., Zvolensky, M. J., & Garey, L. (2021). Increases in distress during stay-at-home mandates during the COVID-19 pandemic: A longitudinal study. *Psychiatry Research*, *298*. <https://doi.org/10.1016/j.psychres.2021.113821>
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality data? *Perspectives on Psychological Science*, *6*(1), 3–5. <https://doi.org/10.1177/1745691610393980>
- Carleton, R. N., Norton, M. A., & Asmundson, G. J. G. (2007). Fearing the unknown: a short version of the intolerance of uncertainty scale. *Journal of Anxiety Disorders*, *21*, 105–117. <https://doi.org/10.1016/j.janxdis.2006.03.014>
- Farias, J., & Pilati, R. (2021). COVID-19 as an undesirable political issue: Conspiracy beliefs and intolerance of uncertainty predict adherence to prevention measures. *Current Psychology*. *Advanced Online Publication*. <https://doi.org/10.1007/s12144-021-01416-0>
- Franz, B., & Dhanani, L. Y. (2021). Beyond political affiliation: an examination of the relationships between social factors and perceptions of and responses to COVID-19. *Journal of Behavioral Medicine*, *44*, 641–652. <https://doi.org/10.1007/s10865-021-00226-w>
- Grossman, G., Kim, S., Rexer, J. M., & Thirumurthy, H. (2020). Political partisanship influences behavioral responses to governors' recommendations for COVID-19 prevention in the United States. *PNAS*, *117*(39). <https://doi.org/10.1073/pnas.2007835117>
- Gusmano, M. K., Miller, E. A., Nadash, P., & Simpson, E. J. (2020). Partisanship in initial state responses to COVID-19 pandemic. *World Medical and Health Policy*, *12*(4), 380–389. <https://doi.org/10.1002/wmh3.372>
- Jost, J. T., Napier, J. L., Thorisdottir, H., Gosling, S. D., Palfai, T. P., & Ostafin, B. (2007). Are needs to manage uncertainty and threat associated with political conservatism or ideological extremity? *Personality and Social Psychology Bulletin*, *33*(7), 989–1007. <https://doi.org/10.1177/0146167207301028>
- Jost, J. T., van der Linden, S., Panagopoulos, C., & Hardin, C. D. (2018). Ideological asymmetries in conformity, desire for shared reality, and the spread of misinformation. *Current Opinion in Psychology*, *23*, 77–83. <https://doi.org/10.1016/j.copsyc.2018.01.003>
- Kerr, J., Panagopoulos, C., & van der Linden, S. (2021). Political polarization on COVID-19 pandemic response in the United States. *Personality and Individual Differences*, *179*. <https://doi.org/10.1016/j.paid.2021.110892>
- Lelkes, Y., & Westwood, S. J. (2016). The limits of partisan prejudice. *Journal of Politics*, *79*(2). <https://doi.org/10.1086/688223>
- Lalot, F., Abrams, D., & Travaglino, G. A. (2020). Aversion amplification in the emerging COVID-19 pandemic: the impact of political trust and subjective uncertainty on perceived threat. *Journal of Community and Applied Social Psychology*, *31*, 213–222. <https://doi.org/10.1002/casp.2490>
- Matthews, G., Burris, S., Ledford, S. L., Gunderson, G., & Baker, E. L. (2017). Crafting richer public health messages for a turbulent political environment. *Journal of Public Health Management & Practice*, *23*(4), 420–423. <https://doi.org/10.1097/PHH.0000000000000610>
- Mertens, G., Gerritsen, L., Duijndam, S., Saleminck, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. *Journal of Anxiety Disorders*, *74*. <https://doi.org/10.1016/j.janxdis.2020.102258>
- Milligan, M. A., Hoyt, D. L., Gold, A. K., Hiserodt, M., & Otto, M. W. (2021). COVID-19 vaccine acceptance: influential roles of political party and religiosity. *Psychology, Health & Medicine*, 1–11. Advance online publication. <https://doi.org/10.1080/13548506.2021.1969026>
- Moonesinghe, R., Khoury, M. J., & Janssens, A. C. J. W. (2007). Most published research findings are false—But a little replication goes a long way. *PLoS Medicine*, *4*(2), e28. <https://doi.org/10.1371/journal.pmed.0040028>
- Motta, M., Stecula, D., & Farhart, C. (2020). How right-leaning media coverage of COVID-19 facilitated the spread of misinformation in the early stages of the pandemic in the U.S. *Canadian Journal of Political Science*, *53*, 335–342. <https://doi.org/10.1017/S0008423920000396>
- Neelon, B., Mutiso, F., Mueller, N., Pearce, J., & Benjamin-Neelon, S. (2021). Associations between governor political affiliation and COVID-19 cases, deaths, and testing in the U.S. *American Journal of Preventive Medicine*, *61*(1), 115–119. <https://doi.org/10.1016/j.amepre.2021.01.034>
- Pedersen, M. J., & Favero, N. (2020). Social distancing during the COVID-19 pandemic: who are the present and future noncompliers? *Public Administration Review*, *80*(5), 805–814. <https://doi.org/10.1111/puar.13240>
- Rabin, C., & Dutra, S. (2021). Predicting engagement in behaviors to reduce the spread of COVID-19: the roles of the health belief model and political party affiliation. *Psychology, Health & Medicine*, 1–10. Advance online publication. <https://doi.org/10.1080/13548506.2021.1921229>
- Rosser, B. R. (2019). Intolerance of uncertainty as a transdiagnostic mechanism of psychological difficulties: a systematic review of evidence pertaining to causality and temporal precedence. *Cognitive Therapy and Research*, *43*, 438–463. <https://doi.org/10.1007/s10608-018-9964-z>
- Rubin, G. J., Amlot, R., Page, L., & Wessely, S. (2009). Public perceptions, anxiety, and behavior change in relation to the swine flu outbreak: cross sectional telephone survey. *BMJ*, *339*. <https://doi.org/10.1136/bmj.b2651>
- Simons, D. J. (2014). The value of direct replication. *Perspectives on Psychological Science*, *9*(1), 76–80. <https://doi.org/10.1177/1745691613514755>
- Taha, S., Matheson, K., Cronin, T., & Anisman, H. (2014). Intolerance of uncertainty, appraisals, coping, and anxiety, the case of the 2009 H1N1 pandemic. *British Journal of Health Psychology*, *19*(3), 592–605. <https://doi.org/10.1111/bjhp.12058>
- Tang, C. S. K., & Wong, C. (2003). An outbreak of the severe acute respiratory syndrome: predictors and effect of community prevention measures in Hong Kong, China. *American Journal of Public Health*, *93*(11), 1887–1888. <https://doi.org/10.2105/ajph.93.11.1887>

- Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., & Asmundson, G. J. G. (2020). COVID stress syndrome: Concept, structure, and correlates. *Depression and Anxiety, 37*(8), 706–714. <https://doi.org/10.1002/da.23071>
- Teeny, J. D., Siev, J. J., Brinol, P., & Petty, R. E. (2021). A review and conceptual framework for understanding personalized matching effects in persuasion. *Journal of Consumer Psychology, 31*(2), 382–414. <https://doi.org/10.1002/jcpy.1198>
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: implications for effective public health campaigns. *Health Education*

& *Behavior, 27*(5), 591–615. <https://doi.org/10.1177/109019810002700506>

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