

Physical distancing during the COVID-19 crisis: The roles of threat and moralization

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Abstract

One reason why the COVID-19 pandemic presented a challenge to public health is that individuals struggled to adhere to virus protective behaviors, such as physical distancing. To aid understanding why people engaged in distancing practices, we investigated the role of threat perceptions and the moralization of physical distancing. We collected longitudinal data from 340 US citizens across five measurement waves from April 2020 to June 2021. Results showed that individuals who perceived COVID-19 as more threatening, and those who more strongly moralized physical distancing, were more likely to engage in physical distancing behavior. Moreover, the effect of threat perceptions on physical distancing behavior was mediated by moralization of physical distancing. These results provide new insights into the adherence to physical distancing behaviors during pandemics and underscore the importance of moralization in shaping behavior.

1 | INTRODUCTION

In March 2020, the World Health Organization (WHO) declared the novel COVID-19 virus a global pandemic (WHO, 2020). To counter the threat of the rapidly spreading virus, citizens around the world were asked to engage in physical distancing behaviors, which implied keeping a distance of at least 1 m from each other and not spending time in groups or crowds. Despite the effectiveness of physical distancing measures in slowing the spread of the virus (Talic et al., 2021), adherence to physical distancing recommendations varied during the pandemic (Gollwitzer et al., 2020; MacNeil et al., 2022). As it is likely that we need to continue participating in physical distancing behaviors during future pandemics, it is important to identify reasons why some people were more likely to engage in physical distancing behaviors than others (Van Bavel et al., 2020). The current study followed US citizens from the start of the pandemic in April 2020 to June 2021. By making use of five waves of longitudinal data

collected across 14 months, the current paper aims to identify possible reasons for engaging in physical distancing behavior during the COVID-19 crisis, which may help to manage possible future pandemics.

There likely are various reasons why people kept distance from other people when asked to do so during the COVID-19 pandemic. The current paper focuses on two important reasons and explores how they together may be associated with distancing behavior. One reason why people may conform to distancing behavior is the threat a pandemic such as COVID-19 can pose to them. We expect that people who perceived COVID-19 as more threatening were more likely to engage in physical distancing behaviors during the pandemic. Another reason why people may conform to distancing behavior during the COVID-19 pandemic may be because they feel it is morally appropriate to do so, and thereby moralize physical distancing. We will further argue that the relationship between perceived threat and physical distancing may be mediated by moralization of this behavior.

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1.1 | Threat perception and physical distancing behavior

Perceiving threats can strongly motivate people's behaviors (Jonas et al., 2014; Murray & Schaller, 2016; Witte & Allen, 2000). People who perceived COVID-19 as more threatening may thus have engaged more in physical distancing behaviors during the pandemic. Threat perception occurs when something in the environment signals negative consequences for an individual, which subsequently creates anxious arousal (Witte & Allen, 2000). Anxious arousal is a negative and uncomfortable experience that people aim to minimize or resolve. This experience activates a motivational system that facilitates defensive responses against that threat (Jonas et al., 2014).

People may respond to threats in a multitude of ways (Jonas et al., 2014). Previous cross-sectional work found that people who, very early on during the pandemic, considered COVID-19 to be threatening engaged more in preventative health behaviors (Olivett et al., 2023), such as distancing behaviors (Lithopoulos et al., 2021; Morstead et al., 2022) and staying at home more frequently (Brown et al., 2023; Ranjit et al., 2021). By means of a longitudinal design, the current paper explores whether this effect of perceived threat is robust and continues to be associated with distancing behavior over the next 15 months during which the pandemic and its associated threat waxed and waned in the public's consciousness.

1.2 | Moralization and physical distancing behavior

We also identify a process that explains *why* perceived threat may be associated with distancing behavior. We expect this to be the case because threat may make people engage in the moralization of this type of behavior. Moralization is defined as an increase in moral conviction of an individual's attitude (Skitka et al., 2021). From the start of the COVID-19 pandemic, compliance with physical distancing guidelines was often discussed as "the right thing to do" (e.g., WHO, n.d.). For some, the choice to physically distance from others had gained moral relevance. This process in which an attitude gains or increases in moral relevance is referred to as moralization (Skitka et al., 2021). What previously merely was a morally neutral attitude or a simple preference could thus become a moral conviction: a strong belief that something is right or wrong (Skitka et al., 2005, 2010). An example is found in attitudes toward cigarette smoking (Rozin, 1999; Rozin & Singh, 1999). Several decades ago, cigarette smoking was mostly a personal preference in the United States. Nowadays, smoking is often viewed in moral terms: Many view smoking to be morally wrong. Similarly, we expect that during the COVID-19 pandemic attitudes toward behaviors such as going out in crowds and standing close to others outside of the household changed from morally neutral to morally relevant: Many people viewed not adhering to the distancing rules not only ineffective to solve the COVID-19 crisis, but also to be morally wrong. These ideas on the moralization of distancing behaviors are indirectly supported by research indicating that people, on average, morally condemned others who did not follow

physical distancing rules (Bor et al., 2022), and judged nonadherence to distancing rules as immoral (Francis & McNabb, 2022).

People who adhere to strong moral convictions are more likely to act in a way that is consistent with these convictions (Skitka, 2010). This is because having a strong moralized attitude prescribes what one should or should not do, leaving people to feel that they have little choice in deciding their course of action (Kouchaki et al., 2018). Moralization can therefore be a powerful motivator for behavior (Prosser et al., 2020). We thus expect that moralization of physical distancing behaviors predicted engagement in these behaviors during the COVID-19 pandemic.

1.3 | Threat perception and moralization

During the COVID-19 pandemic, people had to continuously judge to what extent the virus was a threat and whether physical distancing was a good response to that threat. Several theories on defensive responses to threats indicate that people have a need to increase their sense of certainty during threatening and uncertain contexts, such as the COVID-19 pandemic. That is, theories including the Uncertainty Management Model (UMM; Van den Bos & Lind, 2002), the Reactive Approach-Motivation (RAM) model (McGregor et al., 2010), and the General Process Model of Threat and Defense (Jonas et al., 2014), proposed that people seek to enhance their sense of certainty to diminish their anxious arousal stemming from perceived threats. A common strategy to compensate for feeling anxious and uncertain is by strengthening one's beliefs and attitudes, providing a reassuring sense of confidence (McGregor, 2006, 2010). This effect is supported by various research findings showing that people express more confidence in their beliefs and attitudes after perceiving threats (Briñol et al., 2015; Jonas et al., 2014; Jong et al., 2012; McGregor et al., 2001, 2010). Additionally, research on COVID-19 related threat perception shows that people were seeking to diminish their anxious arousal by expressing more certainty in their everyday language (Simchon et al., 2021) and their attitudes (Moreno et al., 2023).

Building upon these insights, we propose that responses to threats may encompass more than just the strengthening or reinforcement of attitudes; they can become moral convictions. Moral convictions offer a strong defensive response to threat as they are, compared to non-moralized attitudes, characterized by them being experienced as facts and clear motivational guides to what a person should do (Skitka et al., 2005, 2021). As such, moralizing attitudes fulfills a function for people who are confronted with threats and experience anxious arousal by providing them a strong sense of certainty and giving them a clear behavioral guide what to do. This is especially relevant within the context of existential threats, such as a novel and dangerous virus, where the best course of action remains uncertain for some time. To increase a sense of certainty, people who felt threatened by COVID-19 may respond by moralizing the virus-mitigating actions they could take. We thus expected that those who felt more threatened by the COVID-19 virus were more likely to moralize their attitudes toward physical distancing behaviors.

In sum, we propose that during the uncertain time of the COVID-19 pandemic, people who perceived the virus as more threatening were inclined to respond defensively by moralizing their stance on virus-mitigating responses, such as physical distancing behavior. As a result, these people were more likely to engage in these behaviors. We thus expected that the moralization of physical distancing behavior mediated the relationship between COVID-19 threat perception and engagement in these physical distancing behaviors.

1.4 | The study context

The unique study context offered a few potentially confounding variables that we controlled for. Additionally, we conducted exploratory analyses alongside hypothesis testing to gain deeper insights in to the complex dynamics at play within the study context.

To begin with, responses to the COVID-19 pandemic were strongly politicized in the United States (Kerr et al., 2021), with liberals and conservatives displaying significant differences in attitudes and behaviors. For instance, liberals, compared to conservatives, had higher trust in governmental institutions to handle the pandemic (Kerr et al., 2021), saw COVID-19 as more threatening (Collins et al., 2021; Olivett et al., 2023), and engaged more in health protective behaviors, such as wearing face masks (Kerr et al., 2021) and physical distancing (Gollwitzer et al., 2020; Griggs et al., 2022). Political orientation thus may be a potential confounding variable. We therefore included political orientation as a control variable in our analyses. In line with previous work (i.e., Gollwitzer et al., 2020; Griggs et al., 2022), we expected that people indicating to be more conservative were less likely to engage in physical distancing behaviors.

Furthermore, research suggests that political orientation might influence when and why people moralize, indicating that conservatives have overall stronger tendencies to moralize (Everett et al., 2021) and tend to moralize different issues compared to liberals (Skitka et al., 2015). Conservatives, compared to liberals, tend to put more moral value on liberty and personal autonomy (Pereira & Stornelli, 2022; Rains et al., 2022). Being restricted in one's freedom can be considered a moral violation (Ekici et al., 2021), and conservatives' moral convictions that physical distancing restricts them in their personal freedom would make it less likely for them to engage in these behaviors. To explore this further, we tested whether political orientation moderated the relationship between moralization and physical distancing behavior. In addition, as research indicates that conservatives have overall stronger tendencies to moralize (Everett et al., 2021), we explored whether political orientation moderated the relationship between threat perception and moralization of physical distancing.

Another potentially important variable is the ability to comply with physical distancing measures. People who had limited control over physical distancing, for instance because they were expected to continue to leave their house to go to work, were less likely to engage in such behaviors (Hagger et al., 2022). In addition, when people have little control over a behavior that should help mitigate a threat, they may minimize or rationalize the perceived threat (Kok

et al., 2018). In sum, the control that people have over physical distancing behaviors might confound the relationship between threat perception and physical distancing behavior. To account for this potentially confounding effect, we included control over physical distancing behavior as a control variable in our analyses. Following previous work (Hagger et al., 2022), we expected that people who reported to have more control over engaging in physical distancing behaviors were also more likely to engage in these behaviors.

Finally, we explored what the moral position was of people who moralized their attitude toward physical distancing. People can be equally morally convicted about opposite sides of an issue (Bauman & Skitka, 2009). For instance, people may have equally strong moral convictions regarding abortion rights, but hold opposing views on whether it is moral or immoral to legalize abortions. Similarly, physical distancing may be seen as both moral and immoral by different individuals. To explore whether this is the case for our study, we explored the relationship between moral convictions and moral judgments of physical distancing violations. Following previous work finding that people judged violations of physical distancing recommendations as immoral (Bor et al., 2022), we expected that those with stronger moral convictions about physical distancing behaviors would judge distancing violations as more immoral.

2 | The CURRENT RESEARCH

The purpose of the present research was to understand how the moralization of physical distancing behaviors explains (i.e., mediates) the relationship between threat perception and physical distancing behavior during the COVID-19 pandemic. By moralization we refer to the within-person process in which an individual's moral conviction toward physical distancing increased over time. To capture this process, we collected longitudinal data across five measurement waves. From April 2020 to June 2021, we repeatedly measured US citizens' perceptions, convictions, and behavior during the COVID-19 pandemic. Repeatedly measuring moral convictions allowed us to test whether moralization, the within-person process of increasing moral conviction, predicts behavior by separating within-person effects from between-person effects (Curran & Bauer, 2011). Because our data had a nested structure, with repeated observations nested in participants, we tested our hypotheses with multilevel modeling.

3 | METHOD

3.1 | Participants and procedure

We approached participants residing in the United States through Prolific, an online data collection platform known for providing data of sufficient quality for our purposes (Douglas et al., 2023; Peer et al., 2022). It is important to note that participants from Prolific are more likely to be liberal (Douglas et al., 2023) and are more likely to reside in states with Democratic majorities. Given the variation in

responses to the COVID-19 crises between states with different political affiliations (Brownstein, 2020), we took steps to ensure our sample was not biased toward any specific political affiliation at the state level. To achieve this, we invited participants based on their state of residency as registered in Prolific. We choose five states where voters in the 2016 general election predominantly choose the Republican Party (“red states”), and five states where voters predominantly choose the Democratic Party (“blue states”). Furthermore, to mitigate potentially confounding effects of differences in virus prevalence among blue and red states (Brownstein, 2020), we selected states with the highest number of known cases of COVID-19 as of the 9th of April 2020, per 100,000 residents according to the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (Dong et al., 2020). Additionally, we selected states with more than 500 available participants on Prolific in April 2020. The five blue states that we selected were: California, Connecticut, New Jersey, New York, and Washington. The five red states that we selected were Florida, Georgia, Ohio, Pennsylvania, and Texas. Participants received £1.25 for each survey they responded to.

The study consisted of five waves of data collection: April 14, 2020 (Wave 1); June 17–July 1, 2020 (Wave 2); October 29–November 3, 2020 (Wave 3); March 17–March 29, 2021 (Wave 4); and June 16–June 23, 2021 (Wave 5). We distributed surveys in each wave. In Wave 1, we aimed to collect data from 500 participants, 50 nested in 10 states. Of these invited participants, two did not provide their Prolific ID, which was required to invite these participants in subsequent waves. These participants were excluded from our study and not invited to participate in subsequent waves. Of the 500 invited participants, 16 (3.2%) indicated to reside in a state that was not selected for our study. These participants

still received an invitation to subsequent waves, but were excluded from analysis. We excluded participants who choose not to respond to one question on their political orientation ($N = 26$). We did this because political orientation is an important variable to control for in studies on COVID-19 attitudes and virus-mitigating behaviors.

All participants included in Wave 1 ($N = 456$) received an invitation to participate in each of the follow-up waves, even if they did not participate in one or more waves. Of the 456 participants in Wave 1, 62 (13.6%) proceeded to participate in all five waves, 72 (15.8%) participated in four waves, 79 (17.3%) in three waves, 127 (27.9%) in two waves, and 116 (25.4%) participated only in the first wave. We included participants who participated in at least two waves in our analysis ($N = 340$).

The final sample included 125 (36.8%) male participants, 213 (62.6%) female participants, and 2 (0.6%) participants who indicated another gender or preferred not to report their gender. Participant's age ranged from 18 to 79 and the average age was 32.92 ($SD = 11.97$). Participants indicated one ethnic group they considered themselves primarily to belong to; 263 (77.4%) participants identified as White, 51 (15%) Asian, 26 (7.6%) Black or African American, 6 (1.8%) American Indian or Alaskan Native, 3 (0.9%) Native Hawaiian or Pacific Islander, and 10 (2.9%) participants indicated to belong to another ethnic group (e.g., Hispanic, Middle Eastern). Of the final sample, 4 (1.2%) did not have a high school degree; 37 (10.9%) had a high school degree or equivalent as highest completed education; 83 (24.4%) had some college but no degree; 24 (7.1%) had an associate degree; 135 (39.7%) had a bachelor's degree; 42 (12.4%) had a master's degree; 9 (2.6%) had a doctoral degree; and 6 (1.8%) had a professional degree (i.e., JD, MD). As employment status and

TABLE 1 Employment status and approval/capacity to work from home per wave.

Variable	Category	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
		N	%	N	%	N	%	N	%	N	%
Employment status	Working (paid employee)	145	42.6	142	48.0	90	49.5	77	52.4	77	61.6
	Working (self-employed)	52	15.3	46	15.5	34	18.7	28	19.0	18	14.4
	Not working (temporary layoff from a job)	32	9.4	15	5.1	5	2.7	2	1.4	1	0.8
	Not working (looking for work)	32	9.4	25	8.4	16	8.8	10	6.8	7	3.2
	Not working (retired)	8	2.4	5	1.7	7	3.8	8	5.4	4	3.2
	Not working (disabled)	11	3.2	10	3.4	5	2.7	5	3.4	4	3.1
	Not working (other)	53	15.6	45	15.2	20	11.0	13	8.8	10	8.0
	Prefer not to answer	7	2.5	8	2.7	5	2.7	4	1.2	4	3.2
Total		340		296		182		147		125	
Approval/capacity to work from home	Yes	132	71.0	107	62.9	70	63.6	54	65.1	43	54.4
	No	52	28.0	61	35.9	40	36.4	28	33.7	33	41.9
	Unsure	2	1.1	2	1.2	0	0	1	1.2	3	3.8
	Total		186		170		110		83		79

Note: All percentages are valid percentages (i.e., exclude missing data). Wave 1 = April 2020; Wave 2 = June 2020; Wave 3 = November 2020; Wave 4 = March 2021; Wave 5 = June 2021. Examples of the not working (other) category are: student, homemaker, waiting to start school.

work-from-home capacities could change over time, we report in Table 1 the frequencies of these variables in every measurement wave.

3.2 | Measures

We collected two types of data: data from one-time measures and data from repeated measures. One-time measures were included in the first wave. Repeated measures were included in all five waves. Throughout the waves we used the term “social distancing” instead of “physical distancing.” We used social distancing as it was at the time of the first data collection the more commonly used term to describe physical distancing behaviors (Sørensen et al., 2021), and authorities such as the Centers of Disease Control often used this term during the early phase of the pandemic (e.g., CDC, 2020). The surveys included additional measures that are not reported on in the current study. For all measures, see File S1: Appendix A.

3.2.1 | One-time measures

Demographic variables

As demographic variables to describe our sample, we assessed participants' age, gender, ethnic group, and education. We asked participants' age (in years), gender (male, female, other), ethnic group (White, Asian, Black or African American, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander, or other), and education (no high school degree, high school degree or equivalent, some college but no degree, master's degree, doctoral degree, professional degree).

Political orientation

We assessed participants' political orientation with a 7-point scale measure (1 = extremely liberal, 7 = extremely conservative) that is commonly used in social psychological research (e.g., Graham et al., 2009). Participants could also indicate if they did not know the answer to this question or preferred not to answer the question; we excluded these participants from our main analyses ($N = 26$). A higher score on political orientation indicates that participants are more conservative, while a lower score indicates that participants are more liberal.

3.2.2 | Repeated measures

Demographic variables

As demographic variables to describe our sample, we recorded employment status and, if applicable, current approval or capacity provided by the employer to work from home. Respondents could indicate to be working (paid employee or self-employed), not working (temporary layoff from a job, looking for work, retired, disabled, other), or to prefer not to answer. If respondents indicated to be

working, they were asked whether they had approval or capacity from their employer to work from home because of COVID-19 (yes, no, unsure).

Threat perception

We measured threat perception with a one-item measure from Everett et al. (2020). Respondents replied on a 7-point Likert-type scale from 1 (*not a threat at all*) to 7 (*extremely threatening*) to the following question: “How much of a threat do you think COVID-19 (coronavirus) is?” We chose this single item measurement as we were interested in general threat perception rather than subcomponents of threat.

Physical distancing behavior

Respondents replied to three items on a 7-point Likert-type scale from 1 (*never*) to 7 (*all of the time*) to what extent they engaged in physical distancing. These items were taken from Everett et al. (2020) and described physical distancing behaviors in the past 2 weeks. The three items are: “I have stayed at home and avoided all social contact in the past 2 weeks,” “I have avoided public gatherings in the past 2 weeks,” and “I have avoided physical contact with people outside of my household in the past 2 weeks.” We averaged participants' responses to each item into one physical distancing behavior score (Cronbach's $\alpha = .84$), with higher values indicating more engagement in physical distancing behavior.

Moral conviction

We defined moralization as the intra-individual (i.e., within-person) process in which an individual's attitude increases in moral conviction. To capture this process, we assessed participants' moral conviction with regard to physical distancing behavior with three items. Two items are from Skitka et al. (2005), and the third item was added by Feinberg et al. (2019). Respondents answered on a 7-point Likert-type scale from 1 (*not at all*) to 7 (*very much*). The three items are: “To what extent is your position on ‘social distancing’ a reflection of your core moral beliefs and convictions?,” “To what extent are your feelings about ‘social distancing’ connected to your beliefs about ‘right’ and ‘wrong’?,” and “To what extent do you feel the issue of ‘social distancing’ is a moral issue (an issue where your attitude is based on moral values)?” We averaged participants' responses to each item into one moral conviction score (Cronbach's $\alpha = .91$), with higher values indicating stronger moral conviction with regard to physical distancing behavior.

Control over physical distancing behavior

We asked respondents on a 7-point Likert-type scale from 1 (*no control at all*) to 7 (*complete control*): “How much control do you think you have over whether you stay at home and avoid social contact?”

Moral judgment

We asked respondents how they judged violations of physical distancing recommendations with five items. Respondents answered how they judged physical distancing violations on a 9-point Likert-type scale from -4 (*extremely morally wrong*) to 4 (*extremely morally*

right); 0 was coded as morally neutral (*not morally right or morally wrong*). The five items are: “Not practicing ‘social distancing,’” “Going to the park with friends,” “Leaving your home to meet people,” “Going out to public gatherings,” “Have physical contact with people outside of your household.” We averaged participants' responses to each item into one moral judgment score (Cronbach's $\alpha = .90$), with values below 0 indicating that participants rated violations of physical distancing recommendations as more immoral, and values above 0 indicating that participants rated violations of physical distancing recommendations as more moral.

3.3 | Data analysis

Our data had a nested structure, with repeated observations ($N = 1090$) nested in participants ($N = 340$). It is likely that residuals are dependent (i.e., correlated) in data with multiple observations from the same person. To take into account these dependencies, we tested our hypotheses with multilevel modeling. We used the SPSS (version 28.0) mixed procedure for the multilevel regression models. We used the *MLmed* macro by Rockwood and Hayes (2017) in SPSS for multilevel mediation analysis.

Repeated observations can have both a within-person (intra-individual) and a between-person (interindividual) effect on outcomes, and these effects may differ in magnitude and even direction. A well-known example is found in research on the relationship between exercising and heart attacks (Curran & Bauer, 2011): individuals are more likely to experience a heart attack when they exercise more than they usually do (the within-person effect), while people who exercise more than others are less likely to have heart attacks (the between-person effect).

In the current study we were primarily interested in within-person effects. That is, following the definition of moralization as a process taking place within an individual (Skitka et al., 2021), we were interested in whether people who had a stronger moral conviction (i.e., moralized attitude) toward physical distancing at a certain point during the pandemic than they had at other times also engaged more in physical distancing behaviors. Since we defined moralization as an intra-individual process,

we were less interested in the between-person effects that reflect interindividual differences of average moral conviction. By focusing on within-person effects we expand on the current literature which relies on between-person effects in cross-sectional data.

In our multilevel analyses, we separated within-person effects from between-person effects, and concentrated on the former while also reporting the latter. We followed recommendations to person-mean center repeatedly measured predictors (Curran & Bauer, 2011; Raudenbush & Bryk, 2002). We first calculated the person (i.e., participant) mean for each repeatedly measured predictor. These person means capture interindividual variation in the predictor variables and are thus between-person variables. For instance, the person means of moral conviction reflect, for each participant, one's average score on moral convictions with regard to physical distancing behaviors over all waves. We then computed the within-person variables by subtracting the person (i.e., participant) mean from each observation. These person-mean centered scores captured intra-individual variation in the predictor variables and are within-person predictors. For instance, the person-mean centered score of moral conviction reflects whether someone had a stronger moral conviction (i.e., moralized attitude) than usual (i.e., compared to their person mean) at a specific moment during the pandemic.

In building our multilevel models, we included a random intercept in all our models as there was significant between-subjects variance on the outcome variable. We did not aim to investigate random slopes in the current study and the inclusion of random slopes in our main analyses do not affect our conclusions. For ease of interpretation, we present models without random slopes in the text.

4 | RESULTS

4.1 | Descriptive analyses

In Table 2, we present means and standard deviations of our main variables together with the correlations between the within-person and between-person variables.

TABLE 2 Descriptive statistics and correlation matrix.

Variables	M	SD	1	2	3	4	5	6
1. Political orientation	3.15	1.62	-					
2. Threat perception	5.62	1.19	-0.32*	-	0.30*	0.42*	0.18*	-0.45*
3. Moral conviction	5.22	1.20	-0.38*	0.65*	-	0.36*	0.18*	-0.34*
4. Physical distancing	5.41	1.18	-0.34*	0.60*	0.46*	-	0.31*	-0.58*
5. Control over behavior	5.74	1.10	-0.02	0.35*	0.34*	0.61*	-	-0.20*
6. Moral judgment	-1.62	1.09	0.38*	-0.60*	-0.64*	-0.53*	-0.37*	-

Note: Variable 1 is a between-person variable. Variables 2–5 are within-person variables. Means and standard deviations were computed based on the aggregated between-individual scores. Numbers below the main diagonal are between-person correlation coefficients. Numbers above the main diagonal are within-person correlation coefficients. $N = 1090$ for all within-person correlation coefficients. $N = 340$ for all between-person correlation coefficients.

* $p < .001$.

4.2 | Multilevel analysis

Table 2 conveys initial support of our expectation that the perception of COVID-19 as a threat is positively related to the engagement in physical distancing behaviors, as the Pearson's within-person correlation between these two variables is positive and significant. We further tested this relationship by conducting multilevel regression analysis. The multilevel regression model included both the within-person and between-person variables of threat perception together with political orientation and the within- and between-person variables of control over physical distancing behavior. As shown in Table 3, Model 2, threat perception significantly predicted physical distancing behavior on both the between- and the within-person level. The within-person effect showed that participants who found COVID-19 more threatening than usual also engaged more in physical distancing behavior. Furthermore, experiencing control over physical distancing behaviors predicted distancing behavior on the within-person level. The within-person effect showed that participants who had more control over physical distancing behaviors than usual engaged more in these behaviors.

With regard to the between-person effects, participants perceiving COVID-19, on average, as more threatening and having, on average, more control over physical distancing behaviors was associated with more physical distancing behavior. In addition, political orientation was significantly associated with physical distancing behavior; participants who indicated to be more conservative also reported to engage less in physical distancing behavior.

4.3 | Multilevel mediation analysis

We expected that perceiving COVID-19 as threatening would predict moralization of physical distancing behavior. We also expected that

moralization of physical distancing behavior would predict engagement in these behaviors. We thus expected that the moralization of physical distancing behaviors would mediate the relationship between threat perception and physical distancing behavior. We tested this mediation model on both the within- and the between-subjects level and included control over physical distancing behavior and political orientation as control variables. Analyses excluding these control variables revealed very similar results. We refer readers interested in results excluding control variables to File S1: Appendix B.

First, in line with our expectations, we found that perceiving COVID-19 as a threat significantly and positively predicted moral conviction with regard to physical distancing behaviors on both the within- and the between-person level. We present these results in Table 3, Model 1. The significant positive effect on the within-person level shows that participants who found COVID-19 more threatening than usual had stronger moral convictions with regard to physical distancing behavior. The positive between-person effect indicated that those who on average saw COVID-19 as more threatening also had stronger moral convictions.

Second, in further support of our expectations, we observed that moral convictions with regard to physical distancing behaviors significantly and positively predicted physical distancing behavior on the within-person level. This relationship was not significant on the between-person level. We present these results in Table 3, Model 3. In other words, we found that the moralization of physical distancing behaviors—the increase in moral convictions compared to a person's usual level of moral conviction—positively predicted engagement in these behaviors.

Multilevel mediation analysis supported our expectation that the moralization of physical distancing behaviors mediated the relationship between threat perception and physical distancing behavior. A summary of the results of the mediation analysis is presented in

TABLE 3 Model estimates multilevel regression analysis for threat, moral convictions and physical distancing behavior.

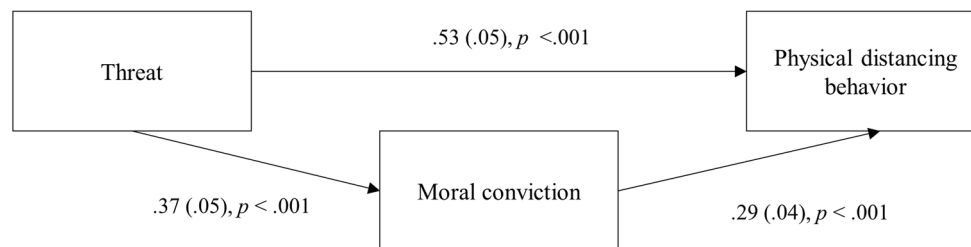
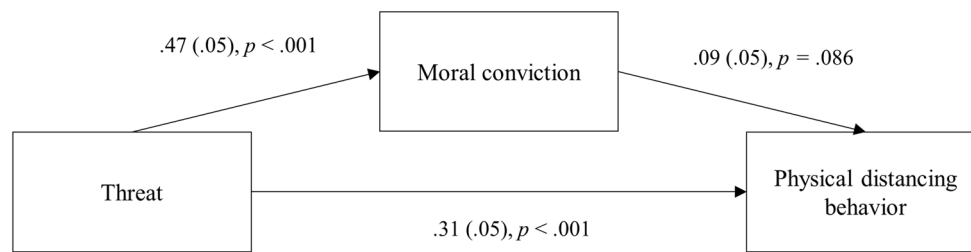
Fixed effect parameter	DV = moral conviction		DV = physical distancing behavior			
	Model 1	SE	Model 2	SE	Model 3	SE
Intercept	2.09***	0.36	1.31***	0.35	1.12***	0.36
Between-person						
Threat	0.47***	0.05	.36***	0.05	.31***	0.05
Control over behavior	0.16***	0.05	0.42***	0.05	.41***	0.04
Political orientation	-0.14***	0.03	-0.11***	0.03	-0.10**	0.03
Moral conviction					0.09	0.05
Within-person						
Threat	0.37***	0.05	.63***	0.05	0.53***	0.06
Control over behavior	0.12***	0.03	.29***	0.04	0.26***	0.04
Moral conviction					0.29***	0.04

Note: Within-person variables are person-mean centered.

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

Between-subjects

indirect effect: .04, $SE = .03$, Monte Carlo 95% CI [-0.01, 0.09]



Within-subjects

indirect effect: .10, $SE = .02$, Monte Carlo 95% CI [0.07, 0.15]

FIGURE 1 Multilevel mediation models on the relationship between threat, moral conviction, and physical distancing behavior, separately for the between- and within-subjects analysis. Note: Parameters are unstandardized regression coefficients. Numbers in parentheses denote standard errors. The parameters are conditional on the inclusion of covariates in the model; see Table 3 for the complete regression models.

Figure 1; the full mediation regression model is presented in Table 3. As can be seen in the lower panel of Figure 1, we found that moral conviction was a significant mediator on the within-person level. Thus, participants who felt more threatened at a certain point during the pandemic also engaged more in physical distancing behavior, and this relationship is partly explained by the moralization of physical distancing practices.

4.4 | Supplemental analyses

4.4.1 | Political orientation

We explored whether our mediation effects were moderated by political orientation. We performed two multilevel moderated mediation analyses. These multilevel moderated mediation models were identical to our main model, except that we added political orientation as a between-person moderator.

We first examined whether political orientation moderated the relationship between threat perception and moral conviction. We found no significant interaction between political orientation and threat on the within-person level ($B = -0.04$, $SE = 0.03$, $p = .185$) or the between-person level ($B = -0.02$, $SE = 0.03$, $p = .464$). We included the full multilevel moderated mediation model in File S1: Appendix C.

We then explored the interaction between political orientation and moral conviction on physical distancing behavior. We found no significant interaction between political orientation and moral conviction on the within-person level ($B < 0.01$, $SE = 0.02$, $p = .869$) or the between-person level ($B = 0.04$, $SE = 0.03$, $p = .118$). We included the full multilevel moderated mediation models in File S1: Appendix D.

4.4.2 | Moral judgment

We also assessed how moral judgments of physical distancing violations were related to moral conviction. Specifically, we wanted to examine whether individuals who moralized physical distancing behaviors viewed violations of distancing measures as either moral or immoral. We looked at the correlation between moral judgment and moral conviction on both the between-person and within-person level; the results are presented in Table 2. The correlation coefficient was negative and significant on both the between- and the within-person level. The correlation on the between-person level indicates that on average over all measurement waves, stronger moral convictions were associated with judgments that physical distancing violations are immoral. The correlation on the within-person level indicates that a stronger moral conviction on a particular wave was

associated with judging violations of physical distancing measures as more immoral. Together, our findings suggest that individuals who moralized physical distancing behaviors were more likely to view violations of distancing measures as immoral.

5 | DISCUSSION

Understanding why some people do or do not engage in virus protective behaviors—such as physical distancing—has been one of the main issues in the behavioral sciences since the start of the COVID-19 pandemic (Bavel et al., 2020). Our findings reveal several new insights on the issue of physical distancing adherence. First, we found that those who perceived COVID-19 as more threatening were more likely to physically distance themselves during the first 15 months of the pandemic. Second, we showed that those who felt more threatened also moralized physical distancing behaviors: These behaviors became more morally relevant, resulting in stronger moral convictions. Third, those who moralized distancing behaviors also engaged more in these behaviors. Finally, moralization mediated the relationship between threat perceptions and physical distancing. In the following sections, we discuss the implications of these results and indicate directions for future research.

5.1 | Implications for understanding physical distancing

Our research contributes to an improved understanding of the relationship between COVID-related threat perceptions and physical distancing behaviors. We found that a stronger perception of COVID-19 as a threat predicts a greater engagement in distancing behavior during the first 15 months of the pandemic. This makes sense from a psychological perspective: Humans are motivated to detect and defend themselves against possible threats in their environment (Jonas et al., 2014; Witte & Allen, 2000), especially against threats related to diseases (Murray & Schaller, 2016). Indeed, research conducted during the first few months of the pandemic showed that physical distancing was one common defensive response to the threat of the novel and dangerous COVID-19 virus (Petherick et al., 2021; Reinders Folmer et al., 2021), especially for those who saw COVID-19 as more threatening (Lithopoulos et al., 2021; Ranjit et al., 2021). However, other publications suggest that after the first few months of the pandemic people might have become less willing to adhere to distancing recommendations even when they perceived to still be at risk (e.g., Gassen et al., 2022; Petherick et al., 2021). If this finding would hold this could imply that the initial relationship between COVID-19 threat perception and adherence to distancing recommendations would decrease over time. In contrast to these suggestions, our findings show that people continue to increase their engagement in physical distancing behaviors when they perceived COVID-19 as more threatening.

Importantly, our research extends beyond showing this association by finding support for a reason why people continued to engage in physical distancing behavior when they felt threatened: the moralization of this behavior. People who perceived COVID-19 as more threatening went beyond considering physical distancing as a defensive measure as they viewed physical distancing through a moral lens. That is, they felt more morally convicted about physical distancing. Moral convictions are strong beliefs that something is right or wrong (Skitka et al., 2005, 2010). When people feel morally convicted about an issue, such as whether one should stay at home and avoid public gatherings, it diminishes their sense of choice in deciding their course of action (Kouchaki et al., 2018). Moral convictions thus act as clear behavioral guides on what people should or should not do. In the case of physical distancing during the COVID-19 crisis, this meant that stronger moral convictions in response to seeing the virus as more threatening motivated people to keep engaging in physical distancing behaviors.

Our research also provides new insights on the behavioral consequences of moralized issues during the COVID-19 pandemic. Previous studies found that individuals felt morally outraged when others challenged COVID-19-related restrictions (Graso et al., 2021), mistrusted others who did not comply to restrictions (Graso et al., 2022), and condemned those who did not keep distance to others in public (Bor et al., 2022). These studies show that moralized attitudes toward COVID-19 restrictions have consequences for individuals' judgment of other people's behavior. The phenomenon of moral hypocrisy, where individuals hold others to stricter moral standards while engaging in less stringent moral behavior themselves (e.g., Lammers, 2012; Valdesolo & DeSteno, 2007), raises the question of whether an individual's moralized stance toward COVID-19 restrictions predicts their own behavior. Our study shows that moralized issues have consequences for how we behave ourselves. That is, our findings demonstrate that people with stronger moral convictions were also more likely to engage in physical distancing behaviors. Our study therefore expanded the growing body of literature on morality and the COVID-19 pandemic by providing a deeper understanding of the relationship between moralization and behavioral responses during this global crisis.

5.2 | Implications for moralization research

Our findings support the idea that moralization, as evidenced by an increase in moral conviction over time, has a function in responding to threats in the environment. Threats create a negative state of anxious arousal—a state that people are motivated to minimize or resolve (Witte & Allen, 2000). An effective approach to alleviating this state is by adjusting or strengthening one's attitudes or beliefs (Jonas et al., 2014; McGregor, 2006), specifically beliefs that meet psychological needs undermined by the threat (Jost et al., 2003). The COVID-19 pandemic, with its novel and dangerous nature, created a situation of great uncertainty and uncertainty-related anxiety (Freston et al., 2020); in other words, it threatened people's need

for certainty. Because moralized attitudes are perceived as objective, universal, and provide a clear behavioral guide what to do (Skitka et al., 2021), feeling morally convicted may help meet the need for certainty arising from threat. Therefore, moral convictions serve an important psychological function in threatening contexts. In sum, threat perception is an important factor that can enhance moralization and should be considered in future research investigating determinants of moralization.

The longitudinal design of our study, combined with the naturalistic setting of the COVID-19 pandemic, strengthens the contribution to our understanding of moralization. After all, our longitudinal design allowed us to observe moralization as it unfolds over time, which is crucial in understanding the moralization process (Rhee et al., 2019). Previous studies using cross-sectional (i.e., Rozin & Singh, 1999) and experimental designs (i.e., Wisneski et al., 2020) provided important insights on the between-level factors related to the moralization process (for reviews, see Rhee et al., 2019; Skitka et al., 2021). However, these studies are limited in their capacity to address changes in morality and within-level factors related to these changes. Our longitudinal design allowed us to identify threat perception as a within-level factor contributing to the moralization process, adding to the growing body of research exploring the determinants of moralization.

Furthermore, our study makes a contribution by examining the natural occurrence of moralization during the COVID-19 pandemic. Unlike Feinberg et al.'s (2019) longitudinal study, which used morally evocative stimuli, such as videos highlighting animal suffering, to evoke the moralization of meat consumption, we used the unfolding of the pandemic to examine how moral convictions develop over time. Because we studied moralization in real-time during a crisis that was important for many people over the world, we increased the ecological validity of our findings and offer insights into the mechanisms of moralization in response to real-world events. This approach thus advances our understanding of how moralization occurs in natural contexts and highlights the importance of studying moralization as it unfolds during significant societal events.

5.3 | Practical implications

Our research offers several practical implications. For instance, our study implies that stimulating the extent to which people see a virus as threatening helps encourage virus mitigating measures, for instance, by informing the public on the threat (Ranjit et al., 2021). Additionally, our research suggests that the effect of threat perception on physical distancing behavior is similar for both liberals and conservatives, suggesting that communicating the threat of a virus to a broad audience would help increase adherence to virus mitigating measures. In this, we acknowledge potential ethical concerns and emphasize the importance of accurate and context-specific information, as inflating threat perceptions may lead to undue fear and anxiety.

Our findings also suggest that moralizing virus-mitigating practices may help motivate virus-mitigating behavior in future pandemics. Individuals who developed stronger moral convictions regarding physical distancing behavior were more likely to engage in these behaviors. There are multiple approaches available, in addition to perceiving threat, that may support the moralization process. One potential approach to facilitate moralization is linking the target behavior, such as physical distancing, to existing moral principles, such as avoiding harm to others (Feinberg et al., 2019). In sum, future pandemic mitigating strategies could benefit from incorporating moralizing messages to increase adherence to virus mitigating practices.

5.4 | Limitations

The current study is not without limitations. First, while we consider the time period from April 2020 to June 2021 in which we collected our data a strength first and foremost, our findings may be specific to this phase of the pandemic. During that time, physical distancing was one of the few available options to mitigate the threat of COVID-19 until vaccines became widely available in April 2021 (AJMC, 2021). Research indicates that the introduction of COVID-19 vaccines impacted threat perception (Iyengar et al., 2022) and compliance with physical distancing behaviors (Si et al., 2021). However, we have not found any work indicating a change in the relationship between threat perception and physical distancing after vaccination. Other research with more data on this postvaccination period of the pandemic could address this question. Nonetheless, even if other research shows that vaccinations changed the relationships between our main constructs, we believe that the finding that a greater threat perception predicts engagement in physical distancing behaviors when vaccines are not available is a valuable insight for future pandemics.

Second, in line with other work, we defined moralization as the process of increasing moral conviction (Skitka et al., 2021; Rhee et al., 2019), without considering the direction of moral judgments related to the moralized issue. For instance, people may have equally strong moral convictions regarding abortion rights, but hold opposing views on whether it is moral or immoral to legalize abortions. Similarly, physical distancing may be seen as both moral and immoral by different individuals. While many people supported COVID-19 mitigation practices such as mask-wearing and lock-down restrictions, there were also those opposed to such measures and resentful toward COVID-19-related restrictions (Mallinas et al., 2021) who might also have moralized their attitudes.

While the current study did not focus on the direction of moral judgments, a measure of moral judgment was included to understand the extent to which people found not engaging in physical distancing to be immoral, moral, or morally neutral, and how this judgment was related to the strength of moral convictions. We found that those with stronger moral convictions tended to judge behaviors such as failing to avoid public gatherings as immoral. Our current study, therefore, shows that people with stronger moral convictions that

physical distancing is the right thing to do will also engage more in these practices. We expect that other research focusing on individuals who hold strong moral objections toward COVID-19 mitigating measures would find a negative relationship between their moral convictions and engagement in physical distancing practices.

While our primary focus was on examining the within-person changes in moral conviction (i.e., moralization), we encountered an unexpected finding related to the between-person effects that deserve further discussion. Previous work using between-person approaches found that stronger moral convictions predict conviction-congruent behavior (i.e., Skitka & Bauman, 2008). In our study, people who, on average, held stronger moral convictions regarding physical distancing behavior were just marginally significantly more likely to engage in such behavior. We expect that this discrepancy may be due to lower statistical power in our between-subjects model compared to our within-subjects model, meaning that the between-subjects model was potentially underpowered. Further investigation into these between-person effects, with a focus on enhancing statistical power and exploring potential moderators, holds promise for shedding light on the intricate relationship between moral convictions and real-world behaviors during threatening contexts.

6 | CONCLUSION

Even with the widespread availability of COVID-19 vaccines, physical distancing remains one of the key recommendations for the public to limit the spread of the virus (CDC, 2023), and it may be necessary to adopt similar measures in future pandemics. Therefore, it is crucial to understand factors that encourage people to practice physical distancing. Our study indicates that viewing COVID-19 as a serious threat increases the likelihood of engaging in distancing behaviors. Furthermore, people who view COVID-19 as more threatening also tend to moralize distancing practices, predicting greater adherence to these practices. These findings can be used ultimately to inform public health strategies aimed at promoting physical distancing behaviors during future pandemics.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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REFERENCES

- AJMC. (2021, June 3). A timeline of COVID-19 vaccine developments in 2021. <https://www.ajmc.com/view/a-timeline-of-covid-19-vaccine-developments-in-2021>
- Bauman, C. W., & Skitka, L. J. (2009). In the mind of the perceiver: Psychological implications of moral conviction. In D. M. Bartels, C. W. Bauman, L. J. Skitka, & D. L. Medin (Eds.), *Psychology of learning and motivation* (Vol. 50, pp. 339–362). Academic Press. [https://doi.org/10.1016/S0079-7421\(08\)00411-8](https://doi.org/10.1016/S0079-7421(08)00411-8)
- Bavel, J. J. V., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten, J., ... Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4(5), 460–471. <https://doi.org/10.1038/s41562-020-0884-z>
- Bor, A., Jørgensen, F., Lindholt, M. F., & Petersen, M. B. (2022). Moralizing the COVID-19 pandemic: self-interest predicts moral condemnation of other's compliance, distancing, and vaccination. *Political Psychology*, 44, 257–279. <https://doi.org/10.1111/pops.12835>
- Van den Bos, K., & Lind, E. A. (2002). Uncertainty management by means of fairness judgments. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 1–60). Academic Press. [https://doi.org/10.1016/S0065-2601\(02\)80003-X](https://doi.org/10.1016/S0065-2601(02)80003-X)
- Briñol, P., Petty, R. E., & DeMarree, K. (2015). Being threatened and being a threat can increase reliance on thoughts: A self-validation approach. In P. J. Carroll, R. M. Arkin, & A. Wichman (Eds.), *Handbook on personal security* (pp. 37–54). Psychology Press.
- Brown, R., Coventry, L., & Pepper, G. (2023). COVID-19: The relationship between perceptions of risk and behaviours during lockdown. *Journal of Public Health*, 31(4), 623–633. <https://doi.org/10.1007/s10389-021-01543-9>
- Brownstein, R. (2020, March 20). Red and blue America aren't experiencing the same pandemic. <https://www.theatlantic.com/politics/archive/2020/03/how-republicans-and-democrats-think-about-coronavirus/608395/>
- CDC. (2020, July 6). Social distancing keep a safe distance to slow the spread. <https://stacks.cdc.gov/view/cdc/90522>
- CDC. (2023, January 26). How to protect yourself and others. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html>
- Collins, R. N., Mandel, D. R., & Schywiola, S. S. (2021). Political identity over personal impact: Early U.S. reactions to the COVID-19 pandemic. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.607639>
- Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual Review of Psychology*, 62, 583–619. <https://doi.org/10.1146/annurev.psych.093008.100356>
- Dong, E., Du, H., & Gardner, L. (2020). An interactive web-based dashboard to track COVID-19 in real time. *The Lancet Infectious Diseases*, 20(5), 533–534. [https://doi.org/10.1016/S1473-3099\(20\)30120-1](https://doi.org/10.1016/S1473-3099(20)30120-1)
- Douglas, B. D., Ewell, P. J., & Brauer, M. (2023). Data quality in online human-subjects research: Comparisons between MTurk, Prolific, CloudResearch, Qualtrics, and SONA. *PLoS ONE*, 18(3), e0279720. <https://doi.org/10.1371/journal.pone.0279720>
- Ekici, H., Yücel, E., & Cesur, S. (2021). Deciding between moral priorities and COVID-19 avoiding behaviors: A moral foundations vignette study. *Current Psychology*, 42(7), 5922–5938. <https://doi.org/10.1007/s12144-021-01941-y>
- Everett, J. A. C., Clark, C. J., Meindl, P., Luguri, J. B., Earp, B. D., Graham, J., Ditto, P. H., & Shariff, A. F. (2021). Political differences in free will belief are associated with differences in moralization. *Journal of Personality and Social Psychology*, 120(2), 461–483. <https://psycnet.apa.org/doi/10.1037/pspp0000286>
- Everett, J. A. C., Colombatto, C., Chituc, V., Brady, W. J., & Crockett, M. (2020, March 20). The effectiveness of moral messages on public

- health behavioral intentions during the COVID-19 pandemic. <https://doi.org/10.31234/osf.io/9yqs8>
- Feinberg, M., Kovacheff, C., Teper, R., & Inbar, Y. (2019). Understanding the process of moralization: How eating meat becomes a moral issue. *Journal of Personality and Social Psychology*, 117(1), 50–72. <https://doi.org/10.1037/pspa0000149>
- Francis, K. B., & McNabb, C. B. (2022). Moral decision-making during COVID-19: Moral judgements, moralisation, and everyday behaviour. *Frontiers in Psychology*, 12, 6484. <https://doi.org/10.3389/fpsyg.2021.769177>
- Freeston, M., Tiplady, A., Mawn, L., Bottesi, G., & Thwaites, S. (2020). Towards a model of uncertainty distress in the context of Coronavirus (COVID-19). *The Cognitive Behaviour Therapist*, 13, e31. <https://doi.org/10.1017/S1754470X2000029X>
- Gassen, J., Nowak, T. J., Henderson, A. D., Weaver, S. P., Baker, E. J., & Muehlenbein, M. P. (2022). Longitudinal changes in COVID-19 concern and stress: Pandemic fatigue overrides individual differences in caution. *Journal of Public Health Research*, 11(3), 227990362211190. <https://doi.org/10.1177/22799036221119011>
- Gollwitzer, A., Martel, C., Brady, W. J., Pärnamets, P., Freedman, I. G., Knowles, E. D., & Van Bavel, J. J. (2020). Partisan differences in physical distancing are linked to health outcomes during the COVID-19 pandemic. *Nature Human Behaviour*, 4(11), 1186–1197. <https://doi.org/10.1038/s41562-020-00977-7>
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, 96(5), 1029–1046. <https://doi.org/10.1037/a0015141>
- Graso, M., Chen, F. X., & Reynolds, T. (2021). Moralization of Covid-19 health response: Asymmetry in tolerance for human costs. *Journal of Experimental Social Psychology*, 93, 104084. <https://doi.org/10.1016/j.jesp.2020.104084>
- Graso, M., Henwood, A., Aquino, K., Dolan, P., & Chen, F. X. (2022). The dark side of belief in COVID-19 scientists and scientific evidence. *Personality and Individual Differences*, 193, 111594. <https://doi.org/10.1016/j.paid.2022.111594>
- Griggs, A., Weaver, J., & Alvarado, J. (2022). Masking our risky behavior: How licensing and fear reduction reduce social distancing behavior. *The Journal of Social Psychology*, 162(5), 607–620. <https://doi.org/10.1080/00224545.2021.1939250>
- Hagger, M. S., Smith, S. R., Keech, J. J., Moyers, S. A., & Hamilton, K. (2022). Predicting physical distancing over time during COVID-19: Testing an integrated model. *Psychology & Health*, 37(12), 1436–1456. <https://doi.org/10.1080/08870446.2021.1968397>
- Iyengar, K. P., Ish, P., Botchu, R., Jain, V. K., & Vaishya, R. (2022). Influence of the Peltzman effect on the recurrent COVID-19 waves in Europe. *Postgraduate Medical Journal*, 98(e2), e110–e111. <https://doi.org/10.1136/postgradmedj-2021-140234>
- Jonas, E., McGregor, I., Klackl, J., Agroskin, D., Fritsche, I., Holbrook, C., Nash, K., Proulx, T., & Quirin, M. (2014). Threat and defense: From anxiety to approach. In J. M. Olson, & M. P. Zanna (Eds.), *Advances in experimental social psychology* (Vol. 49, pp. 219–286). Academic Press. <https://doi.org/10.1016/B978-0-12-800052-6.00004-4>
- Jong, J., Halberstadt, J., & Bluemke, M. (2012). Foxhole atheism, revisited: The effects of mortality salience on explicit and implicit religious belief. *Journal of Experimental Social Psychology*, 48(5), 983–989. <https://doi.org/10.1016/j.jesp.2012.03.005>
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129(3), 339–375. <https://doi.org/10.1037/0033-2909.129.3.339>
- 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, 110892. <https://doi.org/10.1016/j.paid.2021.110892>
- Kok, G., Peters, G. J. Y., Kessels, L. T. E., Ten Hoor, G. A., & Ruiter, R. A. C. (2018). Ignoring theory and misinterpreting evidence: The false belief in fear appeals. *Health Psychology Review*, 12(2), 111–125. <https://doi.org/10.1080/17437199.2017.1415767>
- Kouchaki, M., Smith, I. H., & Savani, K. (2018). Does deciding among morally relevant options feel like making a choice? How morality constrains people's sense of choice. *Journal of Personality and Social Psychology*, 115(5), 788–804. <https://doi.org/10.1037/pspa0000128>
- Lammers, J. (2012). Abstraction increases hypocrisy. *Journal of Experimental Social Psychology*, 48(2), 475–480. <https://doi.org/10.1016/j.jesp.2011.07.006>
- Li, Y., Luan, S., Li, Y., Wu, J., Li, W., & Hertwig, R. (2022). Does risk perception motivate preventive behavior during a pandemic? A longitudinal study in the United States and China. *American Psychologist*, 77(1), 111–123. <https://doi.org/10.1037/amp0000885>
- Lithopoulos, A., Liu, S., Zhang, C.-Q., & Rhodes, R. E. (2021). Predicting physical distancing in the context of COVID-19: A test of the extended parallel process model among Canadian adults. *Canadian Psychology/Psychologie canadienne*, 62(1), 56–64. <https://doi.org/10.1037/cap0000270>
- MacNeil, S., Deschênes, S., Knäuper, B., Carrese-Chacra, E., Dialahy, I. Z., Suh, S., Durif, F., & Gouin, J. P. (2022). Group-based trajectories and predictors of adherence to physical distancing during the COVID-19 pandemic. *Psychology & Health*, 37(12), 1492–1510. <https://doi.org/10.1080/08870446.2021.2014486>
- Mallinas, S. R., Maner, J. K., & Ashby Plant, E. (2021). What factors underlie attitudes regarding protective mask use during the COVID-19 pandemic? *Personality and Individual Differences*, 181, 111038. <https://doi.org/10.1016/j.paid.2021.111038>
- McGregor, I. (2006). Offensive defensiveness: Toward an integrative neuroscience of compensatory zeal after mortality salience, personal uncertainty, and other poignant self-threats. *Psychological Inquiry*, 17(4), 299–308. <https://doi.org/10.1080/10478400701366977>
- McGregor, I., Nash, K., Mann, N., & Phillips, C. E. (2010). Anxious uncertainty and reactive approach motivation (RAM). *Journal of Personality and Social Psychology*, 99(1), 133–147. <https://doi.org/10.1037/a0019701>
- McGregor, I., Zanna, M. P., Holmes, J. G., & Spencer, S. J. (2001). Compensatory conviction in the face of personal uncertainty: Going to extremes and being oneself. *Journal of Personality and Social Psychology*, 80(3), 472–488. <https://doi.org/10.1037/0022-3514.80.3.472>
- Moreno, L., Paredes, B., Horcajo, J., Briñol, P., See, M., DeMarree, K. G., & Petty, R. E. (2023). The effects of perceived COVID-19 threat on compensatory conviction, thought reliance, and attitudes. *European Journal of Social Psychology*, 53(6), 1309–1325. <https://doi.org/10.1002/ejsp.2976>
- Morstead, T., Zheng, J., Sin, N. L., King, D. B., & DeLongis, A. (2022). Adherence to recommended preventive behaviors during the COVID-19 pandemic: The role of empathy and perceived health threat. *Annals of Behavioral Medicine*, 56(4), 381–392. <https://doi.org/10.1093/abm/kaab107>
- Murray, D. R., & Schaller, M. (2016). The behavioral immune system: Implications for social cognition, social interaction, and social influence. In J. M. Olson, & M. P. Zanna (Eds.), *Advances in experimental social psychology* (Vol. 53, pp. 75–129). Academic Press. <https://doi.org/10.1016/bs.aesp.2015.09.002>
- Olivett, V. J., Maranges, H. M., & March, D. S. (2023). The unique roles of threat perception and misinformation accuracy judgments in the relationship between political orientation and COVID-19 health behaviors. *Journal of Applied Social Psychology*, 53(6), 508–518. <https://doi.org/10.1111/jasp.12960>
- Peer, E., Rothschild, D., Gordon, A., Evernden, Z., & Damer, E. (2022). Data quality of platforms and panels for online behavioral research.

- Behavior Research Methods*, 54(4), 1643–1662. <https://doi.org/10.3758/s13428-021-01694-3>
- Pereira, B., & Stornelli, J. (2022). Collective health versus individual freedom: Goal centrality and political identity shape Covid-19 prevention behaviors. *Journal of the Association for Consumer Research*, 7(1), 17–26. <https://doi.org/10.1086/711837>
- Petherick, A., Goldszmidt, R., Andrade, E. B., Furst, R., Hale, T., Pott, A., & Wood, A. (2021). A worldwide assessment of changes in adherence to COVID-19 protective behaviours and hypothesized pandemic fatigue. *Nature Human Behaviour*, 5(9), 1145–1160. <https://doi.org/10.1038/s41562-021-01181-x>
- Prosser, A. M. B., Judge, M., Bolderdijk, J. W., Blackwood, L., & Kurz, T. (2020). 'Distancers' and 'non-distancers'? The potential social psychological impact of moralizing COVID-19 mitigating practices on sustained behaviour change. *British Journal of Social Psychology*, 59(3), 653–662. <https://doi.org/10.1111/bjso.12399>
- Rains, S. A., Colombo, P. M., Quick, B. L., & Kriss, L. A. (2022). State mask mandates and psychological reactance theory: The role of political partisanship and COVID-19 risk in mask adoption and resistance. *Social Science & Medicine*, 314, 115479. <https://doi.org/10.1016/j.socscimed.2022.115479>
- Ranjit, Y. S., Shin, H., First, J. M., & Houston, J. B. (2021). COVID-19 protective model: The role of threat perceptions and informational cues in influencing behavior. *Journal of Risk Research*, 24(3–4), 449–465. <https://doi.org/10.1080/13669877.2021.1887328>
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*, Vol. 1, Sage.
- Reinders Folmer, C. P., Brownlee, M. A., Fine, A. D., Kooistra, E. B., Kuiper, M. E., Olthuis, E. H., de Bruijn, A. L., & Van Rooij, B. (2021). Social distancing in America: Understanding long-term adherence to COVID-19 mitigation recommendations. *PLoS One*, 16(9), e0257945. <https://doi.org/10.1371/journal.pone.0257945>
- Rhee, J. J., Schein, C., & Bastian, B. (2019). The what, how, and why of moralization: A review of current definitions, methods, and evidence in moralization research. *Social and Personality Psychology Compass*, 13(12), e12511. <https://doi.org/10.1111/spc3.12511>
- Rockwood, N. J., & Hayes, A. F. (2017, May). MLmed: An SPSS macro for multilevel mediation and conditional process analysis. Poster presented at the annual meeting of the Association of Psychological Science (APS), Boston, MA.
- Rozin, P. (1999). The process of moralization. *Psychological Science*, 10(3), 218–221. <https://doi.org/10.1111/1467-9280.00139>
- Rozin, P., & Singh, L. (1999). The moralization of cigarette smoking in the United States. *Journal of Consumer Psychology*, 8(3), 321–337. https://doi.org/10.1207/s15327663jcp0803_07
- Sheeran, P., & Webb, T. L. (2016). The intention–behavior gap. *Social and Personality Psychology Compass*, 10(9), 503–518. <https://doi.org/10.1111/spc3.12265>
- Si, R., Yao, Y., Zhang, X., Lu, Q., & Aziz, N. (2021). Investigating the links between vaccination against COVID-19 and public attitudes toward protective countermeasures: Implications for public health. *Frontiers in Public Health*, 9, 702699. <https://doi.org/10.3389/fpubh.2021.702699>
- Simchon, A., Turkin, C., Svoray, T., Kloog, I., Dorman, M., & Gilead, M. (2021). Beyond doubt in a dangerous world: The effect of existential threats on the certitude of societal discourse. *Journal of Experimental Social Psychology*, 97, 104221. <https://doi.org/10.1016/j.jesp.2021.104221>
- Skitka, L. J. (2010). The psychology of moral conviction. *Social and Personality Psychology Compass*, 4(4), 267–281. <https://doi.org/10.1111/j.1751-9004.2010.00254.x>
- Skitka, L. J., & Bauman, C. W. (2008). Moral conviction and political engagement. *Political Psychology*, 29(1), 29–54. <https://doi.org/10.1111/j.1467-9221.2007.00611.x>
- Skitka, L. J., Bauman, C. W., & Sargis, E. G. (2005). Moral conviction: Another contributor to attitude strength or something more. *Journal of Personality and Social Psychology*, 88(6), 895–917. <https://doi.org/10.1037/0022-3514.88.6.895>
- Skitka, L. J., Hanson, B. E., Morgan, G. S., & Wisneski, D. C. (2021). The psychology of moral conviction. *Annual Review of Psychology*, 72, 347–366. <https://doi.org/10.1146/annurev-psych-063020-030612>
- Skitka, L. J., Morgan, G. S., & Wisneski, D. C. (2015). Political orientation and moral conviction: A conservative advantage or an equal opportunity motivator of political engagement? In J. Forgas, W. Crano, & K. Fiedler (Eds.), *Social psychology and politics* (pp. 57–74). Routledge.
- Sørensen, K., Okan, O., Kondilis, B., & Levin-Zamir, D. (2021). Rebranding social distancing to physical distancing: calling for a change in the health promotion vocabulary to enhance clear communication during a pandemic. *Global Health Promotion*, 28(1), 5–14. <https://doi.org/10.1177/1757975920986126>
- Talic, S., Shah, S., Wild, H., Gasevic, D., Maharaj, A., Ademi, Z., Li, X., Xu, W., Mesa-Eguiaray, I., Rostron, J., Theodoratou, E., Zhang, X., Motee, A., Liew, D., & Ilic, D. (2021). Effectiveness of public health measures in reducing the incidence of covid-19, SARS-CoV-2 transmission, and Covid-19 mortality: Systematic review and meta-analysis. *BMJ*, 375, e068302. <https://doi.org/10.1136/bmj-2021-068302>
- Valdesolo, P., & DeSteno, D. (2007). Moral hypocrisy: Social groups and the flexibility of virtue. *Psychological Science*, 18(8), 689–690. <https://doi.org/10.1111/j.1467-9280.2007.01961.x>
- WHO. (2020, March 11). WHO Director-General's opening remarks at the media briefing on COVID-19—11 March 2020. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>.
- WHO. (n.d). COVID-19: Physical distancing. Retrieved September 5, 2022, from <https://www.who.int/westernpacific/emergencies/covid-19/information/physical-distancing>.
- Wisneski, D. C., Hanson, B. E., & Morgan, G. S. (2020). The roles of disgust and harm perception in political attitude moralization. *Politics and the Life Sciences*, 39(2), 215–227. <https://doi.org/10.1017/pls.2020.22>
- 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>

SUPPORTING INFORMATION

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

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