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Health Messaging During a Pandemic: How Information Type and Individual Factors Influence Responses to COVID-19 Messages

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Abstract

Traditional approaches to public health messaging suggest successful COVID-19 messages should communicate about the health threat and present effective protective behaviors. However, as the pandemic continues, how individual factors affect audience responses to such messages needs to be explored. We surveyed 224 U.S. residents (equal distribution among age group, education level, and gender) in a 2 (health threat information: high versus low) × 2 (self-efficacy information: present versus absent) × 2 (response efficacy information: present versus absent) experimental design. Variations in message information did not influence mask wearing and handwashing behavioral intentions. Instead, participant responses followed reactance theory predictions. Feelings of fear about COVID-19 and reactance proneness predicted a perceived freedom threat. Perceiving a freedom threat predicted reactance to the COVID-19 message, which was associated with decreased intentions to wear a mask and handwash. Political ideology was also associated with behavioral intentions. The more conservative a person identified, the less likely they were to intend to engage in COVID-19 protection behaviors. Our findings call into question the effectiveness of traditional health messaging during a pandemic and demonstrate the implications of politicizing health behaviors.

Keywords

COVID-19, health messaging, health threat information, efficacy information, political ideology, reactance

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Public health messaging about COVID-19 risks and protective behaviors has struggled to achieve its desired effects (Sauer et al., 2021). This shortcoming was acknowledged by both Dr. Anthony Fauci, Chief Medical Advisor to the President of the United States, and Dr. Rochelle Walensky, Director of the Centers for Disease Control and Prevention (Simmons-Duffin, 2022; Zak & Roberts, 2022). Research on and about COVID-19 messaging has confirmed their assertions. For example, the ambiguity in early pandemic health messaging led to public confusion about mask use (Zhang et al., 2021).

Health communication theory provides guidance on how health recommendations should be crafted to best persuade the public into adherence, yet the broader social and political contextualization of COVID-19 needs to be considered in conjunction with theoretical predictions. Our study examines whether common approaches to health messaging, namely, the inclusion of health threat and efficacy information, affect individuals' attitudes and behavioral intentions about COVID-19 protective behaviors approximately a year into the pandemic in the United States. In addition, we examine two important individual factors: reactance and political ideology.

Using Fear Appeals to Communicate Health Risks

One popular fear appeal theory, the extended parallel process model (EPPM; Witte, 1992), argues successful health messages include information on the susceptibility and severity of the health threat (e.g., getting the disease COVID-19), the effectiveness of the recommended behavior (i.e., response efficacy), and ability of the audience to perform the recommended behavior (i.e., self-efficacy). Indeed, the persuasive effects of the threat-efficacy information combination has been found in several meta-analyses and across a variety of health topics (Bigsby & Albarracín, 2022; Tannenbaum et al., 2015; Witte & Allen, 2000). Fear appeals are not successful when they fail to create a perceived threat or successfully create a perceived threat but fail to create a sense of perceived efficacy in the audience. Messages that fail to establish a health threat among the audience are hypothesized to lead to no response, while messages that create a sense of threat but do not instill sufficient efficacy among audiences are hypothesized to lead to maladaptive outcomes. According to the EPPM, maladaptive outcomes include reactance, message minimization, and source degradation (Witte, 1992; Witte & Allen, 2000). In this study, we focus on reactance in response to fear appeals.

In addition to message shortcomings, fear appeals may fail for other reasons, including prior experience with the risk (Muthuswamy et al., 2009; Popova, 2012; Tannenbaum et al., 2015). The EPPM assumes people are not aware of the health threat or relevant preventative responses *before* message exposure, which has important message design implications (Popova, 2012). Specifically, if the intended audience is already scared, the level of threat information in the message has little effect on fear responses and no effect on attitudes and behavioral intentions (Muthuswamy et al., 2009). Other scholars have suggested knowledge or perceptions of disease prevalence moderate the persuasive effects of fear appeals (Tannenbaum et al., 2015). For example, if COVID-19 has a low prevalence rate (perceived or real) among a specific

population, that population may not be influenced by fear appeals. Thus, the fact that many public health messages continue to rely on fear appeals—by presenting health threat information—well into a global pandemic is surprising, at least from a theoretical standpoint. Keeping the EPPM's assumptions, predictions, and potential moderators in mind, we ask the following research questions.

RQ1: Can threat information (susceptibility plus severity) successfully influence the perceived health threat of COVID-19 during an ongoing pandemic?
RQ2: Can efficacy information (self-efficacy plus response efficacy) successfully influence the perceived efficacy of COVID-19 protective behaviors during an ongoing pandemic?

Fear Appeals and Reactance

Maladaptive responses to fear appeals are understudied (Quick et al., 2018), thus we turn to reactance theory to explain why health threat-focused COVID-19 messages may fail. As outlined previously, if a fear appeal does not successfully persuade the audience to change their attitude, behavioral intention, and/or behavior, one predicted negative response to the message is reactance (Witte, 1992). Reactance is a psychological construct that occurs when individuals are motivated to "act counter to restrictions or pressure that is put on [them]" (Brehm & Brehm, 1981, p. 2). Reactance in response to persuasive messages has been studied extensively (for an overview, see Quick et al., 2013), but few studies have used reactance theory to understand fear appeal failure (Quick et al., 2018). Thus, we use reactance theory to understand people's responses to COVID-19 fear appeals.

According to reactance theory, individuals experience reactance if they perceive a specific freedom of theirs is under threat (e.g., you can no longer go inside a store without wearing a face mask), and, because of that freedom threat, experience anger and negative thoughts. Anger and negative thoughts combine to create the motivational state of reactance. The more reactance an individual feels, the less likely they are to intend to or comply with behavioral requests (Brehm & Brehm, 1981; Quick et al., 2013). Based on reactance theory, we make the following predictions.

H1: Freedom threat perceptions are positively associated with reactance (as measured by anger and negative thoughts).
H2: Reactance is negatively associated with intentions to perform COVID-19 protection behaviors.

According to the EPPM, messages that only present threat information should create high levels of fear and result in maladaptive responses such as reactance. Persuasive fear appeals present threat and efficacy information because, although they still instill fear, they provide the audience with a way to protect themselves against the health threat (Witte, 1992, 1994). Thus, the inclusion of threat information should increase fear responses and ultimately lead to reactance, while the inclusion of efficacy

information should decrease maladaptive responses, including reactance. However, empirical evidence does not fully support these theoretical claims. For example, Tannenbaum et al.'s (2015) meta-analysis of fear appeals found few studies assess fear (71 out of 248 in their database), instead assuming the audience experiences fear based on perceived susceptibility and perceived severity to the health threat or based on persuasion outcomes (e.g., behavioral intentions). Even within the same study, the association between health threat information and fear has been inconsistent. For example, Quick et al. (2018) found threat information was positively associated with fear in one health condition but found no association in the other health condition. Thus, we ask the following research question.

RQ3: Is health threat information positively associated with fear?

Based on the limited number of studies that examine fear in response to a fear appeal, it is not surprising that even fewer studies have examined the connection between fear and maladaptive outcomes. Studies that have examined this relationship report mixed results. For example, Quick et al. (2018) reported a positive association between fear and freedom threat perceptions in one health topic condition but no relationship in the other health topic condition. Thus, we ask the following question.

RQ4: Is fear positively associated with freedom threat perceptions?

Finally, studies exploring the potential reactance mitigating effects of efficacy information report similar mixed results. For example, Quick and Bates (2010) found efficacy appeals had no effect on freedom threat perceptions, while Quick et al. (2018) found efficacy appeals were negatively associated with freedom threat perceptions. Thus, we ask the following research question.

RQ5: Is efficacy information negatively associated with freedom threat perceptions?

Reactance Proneness. Reactance proneness, an assessment of an individual's propensity to resist threats to their personal freedom, influences attitudes and behavioral outcomes in response to persuasive messages and mandates (Quick et al., 2013). Thus, regardless of messaging choices, some individuals are more likely to resist persuasive messages than others. The more reactance prone an individual is, the more likely they are to perceive a personal freedom is being threatened (Quick & Stephenson, 2008; Quick et al., 2011), thus we expect to find the same association in our study.

H3: Reactance proneness is positively associated with freedom threat perceptions.

Political Ideology and COVID-19

Politicians and healthcare professionals have commented on the politicization of the pandemic and related behaviors. During the early stages of the pandemic in the United

States, Calvillo et al. (2020) found that political conservatives were less knowledgeable about COVID-19 and, because of this lack of knowledge, were less able to discern real from fake news and felt less vulnerable to the virus. This finding corresponds with results found by the Pew Research Center which found that Republicans were less likely to see the pandemic as a major threat (Funk & Tyson, 2021). Regarding preventative health behaviors, Fowler and Utych (2020) found that liberal individuals expressed higher intentions to engage in such behaviors (e.g., washing hands, staying home) than conservatives. In addition, conservatives are much less likely to have received or intend to receive a vaccination for COVID-19 (Funk & Tyson, 2021), a disparity that has grown wider since the start of the pandemic (Fridman et al., 2021; Funk & Tyson, 2021). Thus, political ideology can greatly affect perceptions of health risks and behavioral outcomes. In our study, we include political ideology as a covariate variable because it could influence message perceptions and behavioral intentions but do make the following prediction.

H4: The more conservative a person reports their ideology to be, the less likely they are to engage in COVID-19 protection behaviors.

Method

These data come from a larger study that included participant responses to a variety of health topics and message types. The larger study followed a 2 (health threat information: high versus low) × 2 (response efficacy information: present versus absent) × 2 (self-efficacy information: present versus absent) between-subjects design. Thus, participants were randomly assigned to one of eight messages about COVID-19.

Participant Recruitment and Study Procedures

We recruited participants from Dynata's participant panel from February 2021 to March 2021. To be eligible for the study, participants had to currently live in the United States and be 18 years old or older. We also set quotas for specific demographics so that our sample was approximately equal in terms of gender identity, education, and age. If a person was qualified and interested in the study, they read a consent form and indicated consent by continuing with the survey. Participants first responded to a series of demographic (e.g., age, race) and individual difference variables (e.g., reactance proneness). Next, each participant was randomly assigned to a message type (e.g., low health threat message with response efficacy information). After reading the message, participants responded to the rest of the items used in this investigation. At the end of the survey, participants were provided links to access additional information on COVID-19 from the Centers for Disease Control and Prevention and the World Health Organization. On average, it took participants 10 minutes to complete the online survey ($M = 9.85$ minutes, $SD = 11.77$ minutes).

COVID-19 Messages

The messages were designed to include or omit health threat and efficacy information as outlined by Basil and Witte (2012). High health threat messages included information on susceptibility (e.g., "anyone can get COVID-19") and severity (e.g., "serious symptoms of COVID-19 include trouble breathing, pain or pressure in your chest, not being able to wake-up or stay awake, and death"), whereas low health threat messages did not include this information. Response efficacy messages included information on the effectiveness of the recommended protective behaviors (e.g., "the best way to protect yourself is to reduce your exposure. . .wash your hands with soap and water for 20 seconds or use hand sanitizer that contains at least 60% alcohol"). Self-efficacy messages contained information about the ease of performing the recommended behavior (e.g., "washing your hands or using hand sanitizer is an easy way to protect yourself from COVID-19"). Absent efficacy information conditions did not contain those statements. All information was based on the Centers for Disease Control and Prevention recommendations and messaging at the time of the study.

Measures

Participants rated items on a 1 (strongly disagree) to 5 (strongly agree) Likert scale unless noted otherwise. Means, standard deviations, and correlations are reported in Table 1.

Reactance proneness. We assessed reactance proneness via the Hong psychological reactance scale (Hong & Faedda, 1996). The 11-item scale includes items such as, "regulations trigger a sense of resistance in me." Cronbach's α for the scale was .87.

Freedom threat. Participants rated the amount of freedom threat they experienced in response to the message with four items recommended by Dillard and Shen (2005). For example, "the message threatened my freedom to choose." Cronbach's α for the scale was .92.

Reactance. We assessed reactance as a combination of negative thoughts and anger, as recommended by prior research (e.g., Dillard & Shen, 2005; Rains, 2013).

Negative thoughts. Participants responded to three closed-ended items used in prior research (Reynolds-Tylus et al., 2021). For example, "The thoughts I had while reading this message were mostly unfavorable." Cronbach's α for the scale was .93.

Anger. Participants responded to four items used in prior research (e.g., Dillard & Shen, 2005). The prompt was, "While reading this message, I felt. . .," followed by four words to assess feelings of anger (irritated, angry, annoyed, aggravated). Cronbach's α for the scale was .94.

Table 1. Means, Standard Deviations, and Correlations.

	M (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Health Threat Info.	—	—														
2. Self-Eff Info.	—	.01	—													
3. Response Eff Info.	—	.05	.01	—												
4. Reactance Proneness	3.16 (0.82)	.03	−.03	−.03	—											
5. Freedom Threat	2.57 (1.24)	.08	.06	.01	.43*	—										
6. Neg. Thoughts	2.56 (1.25)	.13	.02	−.02	.47*	.75*	—									
7. Anger	2.22 (1.22)	.08	.02	.01	.27*	.64*	.71*	—								
8. Fear	3.02 (1.11)	.05	−.04	−.05	.06	.14*	.29*	.31*	—							
9. P. Health Threat[a]	3.68 (0.99)	−.01	−.05	.02	.04	−.10	−.12	−.17*	.29*	—						
10. P. Eff Mask[b]	4.01 (0.99)	−.08	−.03	.10	.01	−.14*	−.18*	−.31*	.17*	.62*	—					
11. P. Eff Wash[c]	4.17 (0.84)	−.05	.01	.07	.03	−.14*	−.20*	−.32*	.07	.49*	.69*	—				
12. Masking Intention[d]	4.35 (1.06)	−.14*	−.06	.00	−.05	−.20*	−.26*	−.36*	.12†	.60*	.73*	.57*	—			
13. Washing Intention[e]	4.42 (0.94)	−.10	−.04	.01	−.04	−.21*	−.24*	−.26*	.09	.44*	.58*	.64*	.71*	—		
14. Political Ideology	3.98 (1.97)	.06	.05	−.09	.14*	.09	.08	.00	−.08	−.12	−.15*	.02	−.14*	−.13	—	
15. Age	39.04 (16.58)	.11	−.03	−.06	−.13	−.17*	−.25*	−.23*	−.04	.19*	.15*	.21*	.19*	.15*	.17*	—
16. Female	—	−.04	−.03	−.04	−.10	−.19*	−.14*	−.13*	.01	.01	.04	.06	.10	.14*	−.07	−.14*

Note. Health threat information (Health Threat Info.), self-efficacy information (Self-Eff Info.), and response efficacy information (Response Eff Info.) were binary coded (1 = that information was included in the message, 0 = that information was omitted from the message). Gender was binary coded (female = 1, male = 0). Political ideology ranged from 1 (extremely liberal) to 7 (extremely conservative). Age was a continuous variable.

[a]Perceived health threat.

[b]Perceived efficacy for mask wearing.

[c]Perceived efficacy for handwashing.

[d]Behavioral intention for mask wearing.

[e]Behavioral intention for handwashing.

*$p < .05$.

Fear. Participants responded to three items modified from prior research (Dillard et al., 1996; Kahlor, 2010). The prompt was the same for these items as for the anger items, followed by three emotion words (afraid, worried, overwhelmed). Cronbach's α for the scale was .81.

Perceived health threat. Participants responded to six items modified from Witte et al. (2001). Three items assessed perceived severity (e.g., "COVID-19 is a serious threat") and three items assessed perceived susceptibility (e.g., "It is possible that I will get COVID-19"). Cronbach's α for the scale was .87.

Perceived efficacy. Participants responded to 12 items to assess perceived efficacy of two behaviors: wearing a mask in public settings and washing hands or using hand sanitizer frequently. Six items assessed the perceived efficacy for each behavior, three for perceived self-efficacy (e.g., "Wearing a mask when in public settings for the next week is easy to do") and three for perceived response efficacy (e.g., "If I wash my hands or use hand sanitizer frequently for the next week, I am more likely to prevent COVID-19"). All perceived efficacy items were modified from Witte et al. (1996). Cronbach's α was .91 for the mask items and .88 for the handwashing items.

Behavioral intentions.[1] We asked participants about their intentions to engage in the two COVID-19 protection behaviors based on Fishbein and Ajzen's (2010) recommendations. Participants responded to three items for each behavioral intention on a 1 (definitely no) to 5 (definitely yes) scale. For example, "I plan to wear a mask when in public settings for the next week." Cronbach's α was .94 for the mask wearing items and .92 for the handwashing items.

Covariates. Political ideology was assessed on a 7-point Likert-type scale (1 = extremely liberal, 4 = moderate, 7 = extremely conservative). Participants were also given the option to select, "haven't thought much about this"; these responses were treated as missing in our analyses. In addition to political ideology, we also included age (continuous) and gender (female = 1, male = 0) because some reactance research has reported age and gender differences (e.g., Hong et al., 1994; Woller et al., 2007).

Data Analysis

First, we conducted a series of between-groups analysis of variance (ANOVA) tests to determine if the inclusion of health threat and efficacy information affected participants' perceived health threat and perceived efficacy, respectively. ANOVA is appropriate when determining whether categorical independent variables influence continuous dependent variables and are often used to assess the results of experimental studies (Cribbie & Klockars, 2019). Second, to investigate mediating factors and test the theoretical predictions discussed above, we estimated a structural equation model (SEM). SEM is appropriate when testing a theoretical model with latent variables (Mueller & Hancock, 2019).

Results

Participants

Two hundred sixty-three people completed the online experiment. However, we removed 39 people for speeding through the survey (<3 minutes) or failing the attention check item at the end of the survey. Therefore, our final sample size (*N*) was 224. The majority of participants were men (51%), White (77%), and had a Bachelor's degree or higher level of education (33%).

RQ1 and RQ2 Results

To answer RQ1 and RQ2, which asked if threat information would influence perceived health threat and efficacy information would influence perceived efficacy, we ran a series of between-groups ANOVAs. High threat messages were not perceived as more threatening than low threat messages, $F(1, 222) = 0.03$, $p = .86$. Thus, including threat information did not influence individual perceptions of threat of COVID-19 (RQ1). To answer RQ2, we compared messages with both response and self-efficacy information to messages with only one type of efficacy information (self- or response) and no efficacy information. Again, there was no difference between these messages in terms of perceived efficacy of mask wearing, $F(1, 222) = 0.27$, $p = .61$, or perceived efficacy of handwashing, $F(1, 221) = 0.90$, $p = .34$. Thus, including efficacy information did not influence individual perceptions of efficacy related to COVID-19 protection behaviors. Given the null effects of health threat and efficacy information on participants' perceptions, perceived health threat and perceived efficacy were not included in the SEM.

Reactance in Response to COVID-19 Messages

To answer our remaining research questions and test our hypotheses, we estimated a SEM. As suggested by Kline (2016), we first estimated a measurement model to determine the factor structure of the latent variables. We evaluated model fit using the standards put forth by Little (2013). All analyses were conducted in R version 4.1, and all models were tested using the lavaan package (Rosseel, 2012).

Measurement Model. The original measurement model fit was acceptable, $\chi^2(417) = 674.03$, $p < .001$; comparative fit index (*CFI*) = 0.94; Tucker-Lewis index (*TLI*) = 0.93; root mean square error of approximation (*RMSEA*) = 0.06, 90% CI = 0.05, 0.07; standardized root mean residual (SRMR) = 0.07. However, two items from the reactance proneness scale failed to load on the larger factor at the .40 level and were, therefore, removed. The final measurement model had improved model fit, $\chi^2(360) = 511.56$, $p < .001$; *CFI* = 0.96; *TLI* = 0.96; *RMSEA* = 0.05, 90% CI = 0.04, 0.06; *SRMR* = 0.06.

Main Results: RQ3–RQ5 and H1–H4. Next, we tested the hypothesized SEM (see Figure 1) with political ideology, age, and gender included as covariates, which had

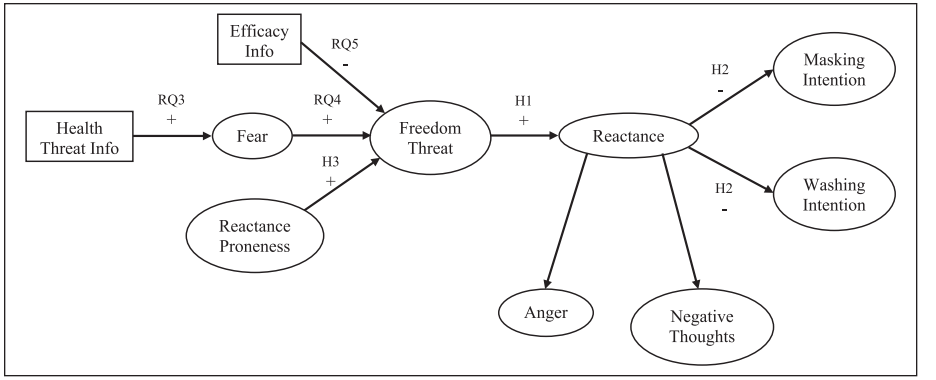

Figure 1. Proposed model relationships and research questions.
Note. H4 predicts an association between political ideology and masking and washing intentions but is included as a covariate in the model because it could also be associated with message perception variables.

acceptable fit, $\chi^2(497) = 720.67$, $p < .001$; *CFI* = 0.95; *TLI* = 0.94; *RMSEA* = 0.05, 90% CI = 0.04, 0.06; *SRMR* = 0.07. The experimental messages did not affect participants' fear or freedom threat perceptions. However, the rest of the proposed model was supported (see Figure 2 and Table 2).

Discussion

Almost one million people have died because of COVID-19 in the United States (Centers for Disease Control and Prevention, 2022). Other long-term implications of the pandemic, such as the effects of long COVID on individuals and our healthcare system, are unknown. Given the severity of the disease, number of people affected, and length of the outbreak, the COVID-19 pandemic will undoubtedly serve as a landmark event in the study of health communication. Public health communicators know it is vital that health messages achieve their desired results. But the pandemic has shown common approaches to public health messaging do not work during an ongoing health crisis. Therefore, we investigated whether the combination of health threat information and efficacy information—considered a successful strategy to communicate about health risks, increase fear, and thus motivate individuals to engage in protective actions—are effective at promoting preventative COVID-19 health behaviors. The results of our investigation show that these message features had no effect on individuals' perceived health threat, perceived efficacy, and fear. Our results are not surprising given fear appeals are most persuasive when the audience is unaware of or unfamiliar with the health threat (Muthuswamy et al., 2009; Popova, 2012). These results do, however, present a communication challenge. Fear appeals are defined by the threat information they present to the audience. If presenting information about the severity of and susceptibility to the health threat is ineffective over a long period of time, other message strategies need to be explored.

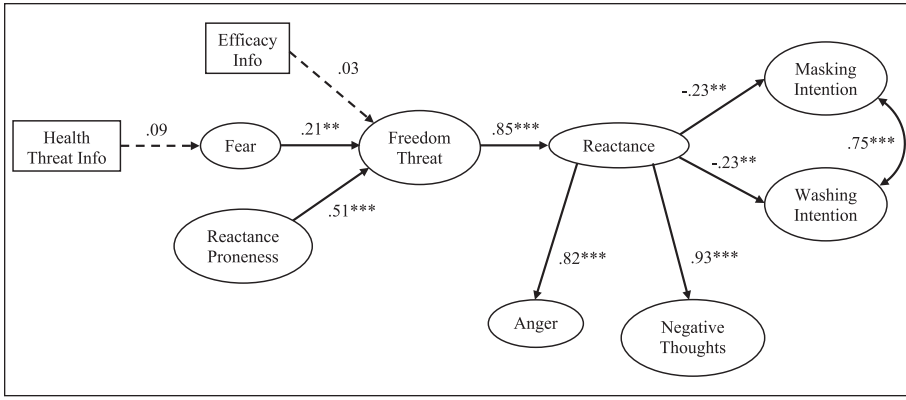

Figure 2. SEM results.
Note. Political ideology, age, and gender were included in the SEM as covariates and are presented in Table 2. SEM = structural equation model.
*$p < .05$. **$p < .01$. ***$p < .001$.

As we expected, participants in our study did demonstrate a maladaptive response in the form of reactance. Although message information did not influence freedom threat perceptions, participant fear in response to reading a COVID-19 message was positively associated with freedom threat perceptions. Thus, participants' fear about COVID-19 had already been established during the first year of the pandemic. As we predicted, those who experienced higher levels of freedom threat were more likely to experience reactance to the messages. Those who experienced higher levels of reactance reported lower intentions to engage in COVID-19 preventative health behaviors. These results provide general support for psychological reactance theory and confirm Quick et al.'s (2018) finding that fear is associated with freedom threat perceptions.

In addition to the theoretical contributions, these results have important implications for public health messaging. Participants reacted negatively to the COVID-19 messages we used in our study, but they may have reacted negatively to any COVID-19 message. Message fatigue, which occurs when an audience is tired of being exposed to messages about the same topic, is positively associated with freedom threat perceptions and reactance (Ball & Wozniak, 2021; Kim & So, 2018). To reduce message fatigue and reactance, public health practitioners and health message creators could use other message design strategies, including narratives and empathy-inducing messages, and frequently change taglines or slogans (Ball & Wozniak, 2021; Quick et al., 2013).

In support of other research on COVID-19 (e.g., Fowler & Utych, 2020; Fridman et al., 2021), we found that politically conservative individuals, compared to liberal individuals, expressed lower intentions to mitigate their risk of COVID-19 by wearing a mask and washing their hands. What makes this finding particularly interesting is that political ideology did not affect any of the other variables (i.e., fear, freedom threat, reactance). Thus, another mechanism is likely at play here. For example, this

Table 2. Latent Regression Paths Predicting Intentions to Perform Preventative Health Behaviors.

	Fear		Freedom threat		Reactance		Masking intention		Washing intention	
Path	*UPC*	*SE*	*UPC*	*SE*	*UPC*	*SE*	*UPC*	*SE*	*UPC*	*SE*
Covariates										
Female	0.04	0.16	−0.42**	0.16	−0.04	0.21	0.22	0.15	0.24	0.15
Political Ideology	−0.05	0.04	0.05	0.04	0.00	0.05	−0.09*	0.04	−0.08*	0.04
Age	−0.01	0.00	−0.01	0.01	−0.02*	0.01	0.01**	0.00	0.01*	0.00
Independent Variables										
Health Threat Info	0.18	0.16								
Efficacy Info			0.08	0.17						
Fear			0.26**	0.10						
Reactance Proneness			0.64***	0.13						
Freedom Threat					1.38***	0.21				
Reactance							−0.12**	0.05	−0.12**	0.04
R^2	.02		.35		.76		.14		.12	

Note. Unstandardized path coefficients (UPC) reported.
*$p < .05$. **$p < .01$. ***$p < .001$.

effect may be due to normative conformity or the authority heuristic, given that conservative leaders (e.g., Fox News) generally adopted skepticism of the virus (Calvillo et al., 2020). Future research should attempt to examine other mechanisms through which political ideology effects behavioral intentions.

Future research should also incorporate other theories into reactance research and public health messaging. For example, trusted organizations are perceived to have greater organizational legitimacy (Prado-Roman et al., 2020). In uncertain environments, such as the COVID-19 pandemic, organizational legitimacy is associated with increased behavioral intentions (Payne et al., 2021). Therefore, it seems likely that organizations perceived as legitimate will have the greatest influence over public health behaviors. Organizations gain legitimacy when the public perceives their actions are appropriate and through effective communication (Díez-Martín et al., 2022; Prado-Roman et al., 2020). Thus, future research could examine how source factors (e.g., comparing different organizations) and communication strategies (e.g., continuous, transparent messages) increase perceived organizational legitimacy, reduce reactance, and increase intentions to practice preventative health behaviors.

The main limitation of this study stems from its cross-sectional design, which limits our ability to make causal claims. Nevertheless, all our predictions were backed by theory and previous research (e.g., Quick et al., 2018). However, future research may wish to conduct a more controlled examination in which components, such as freedom threat, are experimentally manipulated. Another limitation relates to the temporality of the study. Although we were interested in how the timeframe may change COVID-19 message perceptions and responses, we did not compare responses to COVID-19 messages

early in the pandemic (e.g., March 2020) to responses later in the pandemic. Thus, although we assume participants in this study reacted to the information contained in the messages differently than if the virus had been novel, we cannot say for certain.

Through an experimental examination of the effect of health messaging on COVID-19 protection behaviors, we found that traditional fear appeal message features were ineffective at influencing perceived health threat, perceived efficacy, and producing fear. However, our results do support psychological reactance theory, such that those who perceived more freedom threat felt more reactance and, subsequently, reported less intention to perform preventative health behaviors. Thus, in the context of a heavily covered health issue, such as a global pandemic, fear appeal messages and theories may be less appropriate than reactance for predicting behaviors. Additionally, finding that conservatives were less likely than liberals to engage in preventative behaviors demonstrates the negative consequence of politicizing health behaviors. The findings from our study can help improve public health messaging about COVID-19 and future pandemics.

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Note

1. In addition to behavioral intentions, we also assessed attitudes toward the two COVID-19 protection behaviors. Prior research has found direct relationships between reactance and behavioral intention (e.g., Reynolds-Tylus et al., 2021); thus, to save space, we did not include attitudes in this investigation.

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