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FROM ANXIETY TO CONTROL: MASK-WEARING, PERCEIVED MARKETPLACE
INFLUENCE, AND EMOTIONAL WELL-BEING DURING THE COVID-19 PANDEMIC

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ABSTRACT

Mask-wearing has been one of the most prominent, conflicted, and deeply divided issues in the United States during the COVID-19 pandemic. Across two studies, we seek to understand how beliefs and behaviors around mask-wearing are associated with the relationship between anxiety about the coronavirus and feelings of control over one's health outcomes during the pandemic. In Study 1, we find that beliefs in the response efficacy of mask-wearing moderate the relationship between anxiety and control. Study 2 extends these results by investigating the underlying process. Specifically, we find that the relationship between anxiety and control is mediated by self-reported mask-wearing behavior and that the relationship between anxiety and mask-wearing behavior is moderated by consumers' perceived marketplace influence. These findings have important public policy and marketing implications in the context of physical, emotional, and economic well-being.

Keywords: COVID-19, Perceived Marketplace Influence (PMI), compliance with public health recommendations

Mask-wearing has been one of the most prominent, conflicted, and deeply divided issues in the United States during the COVID-19 pandemic. During the first few months of the outbreak, scientists and the medical community in the West warned against mask wearing, as they believed that it could actually do more harm than good (Lauerman, 2020). Specifically, they posited that the moisture collected on the mask could serve as a breeding ground for bacteria and harbor the virus (Haelle, 2020; Nuki, 2020), they worried that those untrained in wearing masks would be more likely to touch their faces and contract the virus (Haelle, 2020; Lauerman, 2020), and they were concerned that members of the general public would hoard scarce masks, making them less accessible to the medical providers who require them (Lauerman, 2020). However, a growing body of subsequent research has found that there are benefits to mask-wearing not only for those in proximity to the person wearing the mask (Haelle, 2020; Nuki, 2020) but also for the wearer (Breslow, 2020; Peeples, 2020) to the point where scientists are investigating a theory that mask-wearing could support immunity for those who wear them (Hayes, 2020) as well as for the population at large (Peeples, 2020). Infectious disease experts suggest that mask-wearing may prevent superspreading events from occurring on airplanes (Douclevff, 2020), and if all U.S. Americans were to wear masks, it would avert the need for economic lockdowns, thereby preventing further financial decline (Aizenman, 2020; Cerullo, 2020). Yet, as of this writing, compliance with mask-wearing in the United States, particularly outside of enclosed public places such as stores (Kramer, 2020), remains mixed (Brenan, 2020; Peeples, 2020).

The reasons for this variance in compliance are many and beyond the scope of this article, but a few will be shared for illustrative purposes. First, as demonstrated above, information about the benefits and risks of mask-wearing has been conflicting and confusing (Breslow, 2020; Peeples, 2020). The inconsistency is partially due to the fact that initial studies

were sparse, and the scientific community updated its recommendations as more evidence became available (Haelle, 2020); it is also due in part to the fact that mask-wearing became a partisan issue with different information being shared from the opposing ends of the political spectrum (Brenan, 2020; Breslow, 2020; Kramer, 2020; Peeples, 2020). Mask-wearing is not common in U.S. American culture (Duncan, 2020; Haelle, 2020), and, anecdotally, some view it as infringing on their personal freedom (Duncan, 2020). In addition, because the last major pandemic to hit the United States occurred in 1918, some have argued that U.S. Americans do not have the fear and anxiety about the virus that has motivated those in China, who experienced the SARS epidemic of 2003, to wear a mask (Duncan, 2020; Haelle, 2020).

Given the motivating power of fear and anxiety, and given the toll that COVID-19 has taken on not only physical but also mental health (Panchal *et al.*, 2020; Pfefferbaum and North, 2020), we were particularly interested in how an emotional well-being construct such as anxiety might be related to compliance with public health recommendations such as wearing a mask in the United States. Specifically, because anxiety can motivate individuals to engage in some sort of action as a way to regain a sense of control (Fiske *et al.*, 1996; Jonas *et al.*, 2014), and because COVID-19 has been particularly damaging to the control that people feel over their health outcomes (Richter, 2020), we wanted to understand how the behavior of mask wearing would relate to feelings of anxiety and control, both of which are likely impacted by the pandemic (Hill, 2020).

Drawing on the literature exploring fear and compliance with public health recommendations (Witte and Allen, 2000), the current paper seeks to explore the relationship between perceived threat (anxiety), efficacy-related variables, mask-wearing, and feelings of control over one's health outcomes during the pandemic. In Study 1, we explore the relationship

between anxiety about the coronavirus and feelings of control over one's health outcomes and test the response efficacy of mask-wearing (beliefs in the protective power of mask-wearing) as a potential moderator. Study 2 expands on these results by investigating the underlying process. Specifically, we sought to extend previous research in marketing and compliance with public health recommendations by examining, not the construct of self-efficacy per se, but rather an efficacy-related variable relevant to consumer behaviors that are publicly visible. Unlike other public health behaviors (e.g., wearing a condom, getting a vaccine) that usually take place in private, mask-wearing is a public health behavior that actually takes place in public. As such, it is susceptible to forms of influence that privately performed public health behaviors are not, and one's belief in one's ability to exert that influence over others becomes relevant. To that end, we extend the construct of perceived marketplace influence (PMI), or "the belief that one's efforts in the marketplace can influence the marketplace behavior of other consumers and organizations, and inasmuch serve as a motivation for one's own behavior" (Leary *et al.*, 2014, p. 1954), into the domain of public health. In particular, we test whether the relationship between anxiety and control is mediated by self-reported mask-wearing behavior and whether the relationship between anxiety and mask-wearing behavior is moderated by consumers' PMI. This research has important public policy and marketing implications in the context of physical, emotional, and economic well-being.

CONCEPTUAL BACKGROUND

Anxiety, Control, and Preventative Behaviors During Pandemics

As of this writing, there is significant evidence that people are experiencing heightened anxiety during the COVID-19 pandemic (Harper *et al.*, 2020; The Lancet, 2020; Torales *et al.*, 2020). This finding is consistent with prior research on pandemics suggesting that feelings of anxiety are a typical reaction (Cheng and Cheung, 2005). For example, during the 2015 MERS pandemic in Korea, people who perceived themselves as being more susceptible to the virus, due to reasons such as poor subjective health, experienced significantly higher levels of worry (Ro *et al.*, 2017). Although distinct from anxiety, worry is considered to be a predictor of anxiety (Gana *et al.*, 2001). Anxiety is also highly related to fear, as both are emotional states driven by perceived threat that are characterized by high activation and intense negative feelings (Öhman, 2008). In the context of the COVID-19 pandemic, specifically, fear and anxiety have been used interchangeably (Harper *et al.*, 2020; Trougakos *et al.*, 2020). Thus, in the present research, we also do not distinguish between fear, worry, and anxiety. With regard to the construct of anxiety, per se, the literature distinguishes between trait anxiety, or relatively stable individual differences in proneness to anxiety (i.e., the frequency with which anxiety states are experienced), and state anxiety, which refers to the intensity of subjective feelings of tension, apprehension, nervousness, and worry experienced at a particular point in time (Spielberger and Reheiser, 2009). For the purposes of the present studies, given our interest in reactions to the COVID-19 pandemic specifically, we define anxiety as state anxiety, or a “mental state characterized by an intense sense of tension, worry or apprehension, relative to something adverse that might happen in the future [...] as a transient reaction to an adverse situation” (Saviola *et al.*, 2020, p. 1).

When people feel anxious, they often experience feelings of lost control (Fiske *et al.*, 1996). Specifically, “anxious people experience intrusive thoughts, or worries [and]...when people lose control over their thoughts, they feel control deprived” (Fiske *et al.*, 1996, p. 121).

Though there exist individual differences in the desire for control (Burger and Cooper, 1979), feeling that one is in control of one's life outcomes is a basic human need and a primary motivator of behavior (Heider, 1958). As such, people experiencing anxiety often seek to restore feelings of control by using various coping strategies (Fiske *et al.*, 1996). Two frameworks of coping strategies that are particularly relevant to this paper are the Compensatory Consumer Behavior Model (Mandel *et al.*, 2017) and Terror Management Theory (Greenberg *et al.*, 1986; Greenberg and Arndt, 2011).

The Compensatory Consumer Behavior Model posits that people are motivated to maintain consistency between their ideal and actual selves along domains such as feelings of power and feelings of control over one's environment, and when that consistency is threatened, people engage in compensatory consumption behaviors to restore their ideal state (Mandel *et al.*, 2017). For example, when financial resources are scarce – such as during an economic depression – women tend to engage in compensatory consumption by purchasing and using more appearance-enhancing items (the “lipstick effect”) as a means of restoring a sense of control over their financial future through enhancing their professional appearance (Netchaeva and Rees, 2016). And when consumers feel as though they lack control, they prefer products that require them to engage in effortful work (Cutright and Samper, 2014). Research has also found that anxiety can lead to panic buying and hoarding behavior, such as that which occurred at the beginning of the COVID-19 pandemic (Usher *et al.*, 2020). In these ways, consumers use purchases to help them restore a sense of control over their environment.

Terror Management Theory, on the other hand, suggests that when people are reminded of their own mortality, the anxiety, or terror, they experience leads them to engage in efforts to reduce the threat of death, bolster their self-esteem, and reinforce their beliefs in their own

worldview (Greenberg and Arndt, 2011). In the domain of consumption, Terror Management Theory has been used to explain materialism and the drive to obtain products that can increase self-esteem and reduce one's perceived vulnerability to death (Arndt *et al.*, 2004). For example, when people are reminded of their own mortality, they increase intentions to buy sunscreen with adequate SPF protection (Routledge *et al.*, 2004) and consume more scarce resources (Kasser and Sheldon, 2000).

In the domain of health promotion, the Terror Management Health Model proposes that mortality salience can affect people in one of two ways, depending on whether the thoughts of death are conscious and accessible: by increasing health-oriented behaviors with the goal of reducing thoughts of death or by encouraging behaviors that bolster one's self-esteem and deepen one's sense of meaning (Greenberg and Arndt, 2008). For example, women primed to think of their own mortality increased intentions to protect their health by buying sunscreen, but after a delay, when thoughts of mortality were less salient, they instead expressed increased interest in self-esteem promoting behaviors such as tanning (Routledge *et al.*, 2004). Mortality salience, and thus Terror Management Theory and the Terror Management Health Model, are particularly relevant to pandemics during which time the news is filled with death toll reports and mortality rates. With thoughts of death made salient, people are more likely to engage in health promoting behaviors like mask-wearing.

Research on past pandemics demonstrates evidence of behaviors that fit with the Terror Management Health Model and the Compensatory Consumer Behavior Model. Specifically, research has shown that people experiencing higher levels of state anxiety during past pandemics were more likely to cope with their anxiety by engaging in preventative behaviors (Bish and Michie, 2010). Some of these preventative behaviors involved purchasing products that could

help them to regain a sense of control (compensatory consumer behavior) while others involved engaging in health behaviors intended to reduce the threat of death (terror management). For example, evidence from the SARS outbreak of 2003 indicates that those who felt that they or a family member were more susceptible to contracting the virus tended to engage in more precautionary measures including using disinfectants, purchasing face masks, and avoiding public events (Blendon *et al.*, 2004). Additionally, a review of the literature on the relationship between pandemic-related behaviors and psychological outcomes found that higher anxiety was associated with increased health protective behaviors such as hand washing, face mask wearing, avoidance of eating out, and social distancing (Usher *et al.*, 2020). During the H1N1 pandemic in 2009, a study examining emotional predictors of pandemic-related mitigation behaviors across Europe found that worry was significantly associated with consumption behaviors such as buying material goods and face masks as well as health promoting behaviors such as intentions to delay travel and the use of public transportation (Goodwin *et al.*, 2011). Thus, we propose the following:

H₁: Greater levels of anxiety about the coronavirus will be associated with lower feelings of control over one's health outcomes during the pandemic.

H₂: Individual differences in anxiety about the coronavirus (state anxiety) will be positively associated with the propensity to wear a mask during the COVID-19 pandemic.

H₃: The relationship between state anxiety and feelings of control over one's health outcomes during the pandemic will be mediated by the degree of compliance with the recommendation to wear a mask.

H₄: Greater levels of state anxiety about the coronavirus will be associated with greater feelings of control over one's health outcomes when wearing a mask during the pandemic.

The Role of Efficacy Constructs in Behavior Change

Importantly, whether people take action to engage in control-restoring behaviors partially depends on their beliefs about efficacy (Terry, 1991). Research on self-efficacy, in general, has found that whether individuals pursue their goals depends on their perceived likelihood of achieving said ideal state (Bandura, 1977). In the context of control, research has found that when individuals are motivated to recover a sense of lost control, they assess whether they have the ability and resources necessary to restore control (Cutright and Samper, 2014). With regard to compliance with public health recommendations, specifically, whether people believe that they can effectively perform the recommended behavior and whether they perceive the health intervention itself to be effective determines whether people will be motivated to control the threat or their fear about the threat (Witte and Allen, 2020). As such, the literature on fear appeals and public health behavior change indicates that stronger, more anxiety-inducing fear appeals are most persuasive and produce the most behavioral change when combined with response efficacy (the belief that the health intervention works) and self-efficacy messages (Witte and Allen, 2020). Similarly, research on the Terror Management Health Model shows that

response efficacy increases intentions to engage in the relevant health-promoting behavior when thoughts of death are conscious (Cooper *et al.*, 2010). Research on pandemics, specifically, has found that people experiencing higher levels of state anxiety were more likely to engage in preventative behaviors if they believed in the effectiveness of the recommended preventative behaviors (Bish and Michie, 2010).

Beliefs also play an important role in restoring a sense of control. Not only do people with a threatened sense of control seek direct control over the situation but also, they increase their beliefs in external forces that provide a sense of structure (Fritzsche *et al.*, 2008; Kay *et al.* 2009). In other words, individuals motivated to restore a sense of lost control not only engage in behaviors intended to help them do so but also, they subscribe to belief systems that engender feelings of control (Kay *et al.*, 2008; Van Prooijen and Acker, 2015). For example, according to compensatory control theories, during times of uncertainty, people tend to embrace ideologies that help them to feel more in control (such as believing that their morally right actions will be rewarded, known as the just-world hypothesis), or they subscribe to religious or political ideologies that make them feel that *someone* is in control (Landau *et al.*, 2015). Given that beliefs in the response efficacy of public health interventions interact with fear to drive attitudes toward and compliance with public health recommendations (Witte and Allen, 2020), and given that beliefs can impact feelings of control, we predict the following:

H₅: The relationship between state anxiety and feelings of control over one's health outcomes during the pandemic will be moderated by beliefs in the protective (response) efficacy of mask-wearing.

Beyond response efficacy, self-efficacy, measured as respondents' confidence that they will be able to practice these preventative measures, was shown to be a predictor of preventative behaviors in past pandemics (Bults *et al.*, 2011), and it likely plays a role in compliance with public health recommendations during the COVID-19 pandemic, as well. Yet, unlike many public health behaviors, such as wearing a condom, getting a vaccine, or even hand washing, which take place in private, mask-wearing during the COVID-19 pandemic is a public health behavior that is actually publicly visible. As such, it is potentially susceptible to forms of social influence that other public health behaviors are not. Moreover, it is other people's participation in mask-wearing that affords the greatest protective benefit to an individual. Thus, people are likely motivated to influence others to wear a mask. We, therefore, extend the role of efficacy in the domain of compliance with public health recommendations by proposing that beliefs in one's own ability to successfully influence the preventative behaviors (i.e., mask-wearing) of others will additionally motivate people to engage in those preventative behaviors (i.e., mask-wearing) in relation to restoring a sense of control. Feeling as though one's behaviors can impact the behaviors of others is a hallmark of the construct, perceived marketplace influence.

Perceived marketplace influence (PMI) is an individual difference variable that explains how one's perceived influence on other marketplace actors inspires one's own behavior (Leary *et al.* 2014). PMI increases consumers' feelings of control over marketplace events through their influence on marketplace actors (Leary *et al.*, 2019). PMI is related to, but distinct from, other efficacy-based constructs (Leary *et al.*, 2017). As an efficacy-related construct, PMI's power comes from a belief in one's efficacy at motivating the behavior of others (Leary *et al.*, 2017). For example, when people believe that their sustainable consumption behavior influences other consumers and organizations to engage in sustainable behavior, it encourages those people to

consume in a sustainable manner (Leary *et al.*, 2014). PMI is also associated with word-of-mouth, and the purchase of and willingness to pay for Fair Trade and philanthropy-linked products (Leary *et al.*, 2019). Although PMI has previously been examined in business-specific contexts, we believe that PMI is particularly relevant to consumption behaviors in the domain of public health where others' usage impacts the self, and actors are, therefore, motivated to inspire others to comply with the recommended behavior. Specifically, in line with previous literature demonstrating the moderating role of efficacy on the relationship between anxiety or fear and compliance with public health recommendations, we predict that:

H₆: Individual differences in PMI will be positively associated with mask-wearing during the COVID-19 pandemic.

Moreover, given that PMI is itself related to feelings of control (Leary *et al.*, 2019), we expect the relationship between state anxiety and wearing a mask to be attenuated as levels of PMI increase. Thus, we propose:

H₇: PMI will moderate the relationship between state anxiety and mask-wearing such that the association between state anxiety and mask-wearing will be attenuated as levels of PMI increase.

In summary, anxiety leads to feelings of lost control, which motivates individuals to engage in actions that can restore their sense of control. In the domain of public health, it is the compliance with the public health recommendation, per se, that can serve as a coping mechanism to deal with potential health threats. Moreover, the more that people believe in the protective

efficacy of the public health intervention, and the more that people believe in their ability to carry out the behavior, the more likely they are to take action. We extend these findings by introducing the construct of perceived marketplace influence (PMI) into the domain of public health and contend that people's beliefs in their ability to influence other marketplace actors by engaging in public health consumption behaviors (i.e., mask-wearing) will attenuate the association between anxiety and the propensity to engage in coping behaviors, which is ultimately associated with feelings of control.

OVERVIEW OF STUDIES

In two studies, we examine the relationship between anxiety about the COVID-19 pandemic and feelings of control over one's health outcomes, particularly in the context of compliance with mask-wearing recommendations. Study 1 investigates beliefs about the response efficacy of mask-wearing as a potential moderator of the relationship between state anxiety and feelings of control over one's health. Study 2 builds on these findings and seeks to explore the underlying process by testing mask-wearing behavior as a potential mediator of the relationship between state anxiety and feelings of control. Further, Study 2 examines the predicted interaction between state anxiety and PMI on mask-wearing behavior. Taken together, these studies seek to extend our understanding of how efficacy-related variables interact with perceived threat to drive compliance with public health recommendations as a way to reclaim control.

STUDY 1

In study 1, we test whether anxiety about COVID-19 is associated with a loss of feeling in control of one's health outcomes during the pandemic. Moreover, we explore whether this predicted relationship is moderated by attitudes toward mask-wearing, specifically participants' belief in the response efficacy of masks (i.e., that mask-wearing can, in fact, protect oneself and others from the coronavirus). We also included two covariates, trait anxiety and desire for control, in the model because they are individual difference variables that may affect our variables of interest. Specifically, people with higher trait anxiety may also have more state anxiety about COVID-19, and people who have a greater desire for control may be more likely to engage in mask-wearing if they believe it is effective at protecting against COVID-19.

Methods and Measures

Participants ($N = 404$) were recruited from Amazon Mechanical Turk (MTurk) through CloudResearch and, after providing informed consent, completed an online survey hosted by Qualtrics in exchange for a small monetary compensation. Scholars have found MTurk samples to yield valid responses (Buhrmester *et al.*, 2011), and the platform has been used to collect data in over 15,000 published papers, many in top academic journals (Chandler and Shapiro, 2016). The sample was comprised of 183 women (45.3%) and 221 men (54.7%). Participants were between the ages of 18 and 82 ($M_{\text{Age}} = 39.3$ years) and were representative of the general U.S. population.

Participants' state anxiety about COVID-19 ("How anxious are you about the coronavirus?") was assessed using a 7-point Likert scale anchored with "Not at all anxious" and "Very anxious".

Intervention response efficacy (i.e., belief in the protective power of mask-wearing) was measured with two items ("To what degree do you think wearing a mask protects the mask-wearer during the COVID-19 pandemic"; "To what degree do you think wearing a mask protects those in proximity to the mask-wearer during the COVID-19 pandemic") using 7-point Likert scales anchored with "Not at all" and "Very much." The belief-in-mask-wearing variable was computed as an average of these two intervention response efficacy items (Cronbach's $\alpha = 0.85$).¹

Feelings of control ("To what extent do you feel in control of your health outcomes during the COVID-19 pandemic?") were assessed using a 7-point Likert scale anchored with "Not at all" and "Very much."

Trait anxiety was measured using the short form of the Dutch version of the Spielberger State-Trait Anxiety Inventory (STAI) trait anxiety (A-Trait) scale (De Vries and Van Heck, 2013). The scale consists of six items (e.g., "I worry too much"; "I am nervous and restless"), and participants indicated how they generally feel by rating how often the statements describe them on a 4-point scale: (1) Almost never; (2) Sometimes; (3) Often; (4) Almost always (Cronbach's $\alpha = 0.91$).

¹ While debate exists in the literature regarding whether data from Likert and similar rating scales are ordinal (categorical) or interval (continuous) (e.g., Labovitz, 1967; Jamieson, 2004), researchers have shown that data collected using rating scales with five or more points can be treated and analyzed as continuous, particularly if the category thresholds presented are symmetrical, and the scale points/end points have clear semantic labels (Labovitz 1967; Rhemtulla *et al.*, 2012). Thus, it is often considered permissible to create means or sums of scores across items and to conduct parametric tests on data from Likert and similar rating scales.

Need for control was measured using the 20-item Desirability of Control Scale (Burger and Cooper, 1979). The scale includes items such as “I would prefer to be a leader than a follower” and “When I see a problem, I prefer to do something about it rather than sit by and let it continue.” Participants indicated the extent to which they believe each statement applies to them on a 7-point Likert scale anchored with endpoints (1) *The statement does not apply at all to me* and (7) *The statement always applies to me* (Cronbach’s $\alpha = 0.86$).

Finally, participants completed a series of demographic questions.

Results

A linear regression was run to examine the interaction between state anxiety and belief-in-mask-wearing on feelings of control over one’s health outcomes during the pandemic. Feelings of control over one’s health outcomes was used as the dependent variable, while state anxiety, belief-in-mask-wearing, and the interaction of state anxiety and belief-in-mask-wearing served as independent predictor variables, and trait anxiety and need for control were included as covariates as indicated in the following equation:

$$\text{FeelingsOfControlOverHealth}_i = \beta_0 + \beta_1 \text{StateAnxiety}_i + \beta_2 \text{Belief-in-Mask-Wearing}_i + \beta_3 \text{StateAnxiety} * \text{Belief-in-Mask-Wearing}_i + \beta_4 \text{TraitAnxiety}_i + \beta_5 \text{NeedForControl}_i + \varepsilon_i$$

The correlation matrix for each factor in the model appears in Table 1. Analysis of the unstandardized residuals revealed no multicollinearity for the focal predictor variables ($VIF < 1.45$).

[Insert Table 1 about here]

Results demonstrated that the overall model was significant ($F(5,398) = 9.73, p < .0001, R^2 = 0.11$; see Figure 1).

[Insert Figure 1 about here]

Specifically, after controlling for the variables of trait anxiety and need for control, there was a significant main effect of state anxiety on feelings of control over one's health outcomes ($b = -0.19 [t = -4.14], p < .0001$), which was qualified by a significant interaction between state anxiety and belief-in-mask-wearing such that the relationship between state anxiety and feelings of control is attenuated as beliefs in the protective efficacy of mask-wearing increases ($b = 0.06 [t = 2.45], p = .01$). Taken together, these results support H1 and H5 (see Table 2 for Study 1 regression results). There was no significant main effect of trait anxiety on feelings of control over one's health outcomes during the pandemic ($b = -0.02 [t = -1.19], p = .23$), but there was a significant main effect of need for control on feelings of control over one's health outcomes ($b = 0.25 [t = 2.55], p = .01$). Given that the predicted relationship between state anxiety and feelings of control was still significant after controlling for trait anxiety and need for control, the two covariates were not investigated further.

[Insert Table 2 about here]

STUDY 2

In Study 2, we test whether anxiety about the COVID-19 pandemic is associated with increased compliance with the public health recommendation to wear a face mask and whether engaging in the public health behavior of wearing a mask is, in turn, related to feelings of control over one's health outcomes during the pandemic. In other words, we propose that compliance with public health recommendations (i.e., mask-wearing) will mediate the relationship between state anxiety and control. Further, we test whether the relationship between state anxiety and wearing a mask is moderated by PMI.

Methods and Measures

Participants ($N = 408$) were recruited from Amazon Mechanical Turk (MTurk) through CloudResearch and, after providing informed consent, completed an online survey hosted by Qualtrics in exchange for a small monetary compensation. The sample was comprised of 182 women (44.6%), 225 men (55.1%), and one non-binary participant. Participants were between the ages of 18 and 77 ($M_{\text{Age}} = 41.4$ years) and were representative of the general U.S. population.

Participants' anxiety about COVID-19 ("How anxious are you about the coronavirus?") was assessed using a 7-point Likert scale anchored with "Not at all anxious" and "Very anxious".

In order to measure past mask-wearing behavior, three factors (whom the participant was with, where the participant was located, and whether the participant was socially-distanced from others) were identified along with respective levels of those factors (company: alone, with quarantine pod/self-isolation bubble, with members of the public; location: at home, in a public building, outside; socially-distanced: distanced or not distanced). The factors were then crossed

to create 12 different situations in which participants may or may not wear a mask (because it is not possible to socially-distance when one is alone, and because the definition of a quarantine pod/self-isolation bubble is specifically those people from whom one does not socially-distance, it did not make sense, conceptually, to cross the socially-distanced factor with those levels of the company factor). The resulting scenarios are listed in Table 3. For each situation, participants indicated on a 5-point Likert scale, anchored with “Never” and “Always”, how often they wear a mask in each situation. Participants could also indicate that they are never in a given situation.

[Insert Table 3 about here]

Participants then completed the PMI Consumer factor of the PMI scale (Leary *et al.*, 2017), which includes 5 items measured on 7-point Likert scales anchored with “Strongly disagree” and “Strongly agree” (e.g., “My behavior guides other individuals to act in a similar manner”; “What I choose to do or say impacts what other consumer choose to do”). PMI scores ranged between 1.0 and 7.0 ($M_{\text{PMI}} = 4.29$; $SD_{\text{PMI}} = 1.29$; Cronbach’s $\alpha = .935$). One potential limitation of the PMI scale is that the scale authors did not check for social desirability bias (Leary *et al.*, 2013). Because consumers may overestimate the degree to which they are influential, we ran a pretest ($N = 62$) to ensure that responses to the PMI scale would not be biased by social desirability. Results showed that there was not a significant correlation between PMI and socially desirable responding, as measured by Reynolds’ (1982) Short Form C of the Marlowe-Crowne Social Desirability Scale ($r = -0.04$, $p = 0.73$).

Feelings of control (“To what extent does wearing a mask during the COVID-19 pandemic make you feel in control of your health outcomes?”) were assessed using a 7-point Likert scale anchored with “Not at all” and “Very much.”

Finally, participants completed a series of demographic questions.

Results

Compliance with mask-wearing recommendations was measured by first computing an average score across participants for each of the 12 mask-wearing situations to determine whether any floor or ceiling effects existed. Based on content validity (the extent to which a measure assesses the construct of interest) as well as mask regulations for indoor, public spaces, such as grocery stores, that were in place at the time of data collection, we did not expect to see much variance for situations such as wearing a mask when at home alone or while in a public building and planned to screen out those items prior to analysis [see Boateng *et al.* (2018) for a discussion of screening out items that contribute little of the variation of the construct being measured]. However, we included the items in the survey so that participants would view and respond to the full range of situations arising from the three factors of company, location, and social distancing, knowing that we would eliminate, a posteriori, those items (situations) that lacked theoretical validity and empirically demonstrated floor and ceiling effects. Therefore, situations with an average compliance score below 2, thereby presenting a floor effect, were eliminated from further analysis. Situations with an average compliance score above 4, thus presenting a ceiling effect, were also eliminated from further analysis (see Table 3 for situations presenting floor and ceiling effects).

This process left six situations to be included for further analysis² and is consistent with the purpose of wearing a mask (not being exposed to others' airborne droplets or aerosols, so it does not make sense to wear a mask while alone in one's own home), the definition of a quarantine pod (i.e., those people with whom one does not socially-distance or wear a mask), and the growing syndicated research finding that, around the time when the present study was conducted, most U.S. Americans reported wearing a mask inside public buildings (Kramer, 2020). A mask-wearing score was then computed for each participant by summing their responses across the six scenarios and then dividing that sum by the total number of applicable scenarios (recall that participants could indicate that a scenario did not apply to them). Mask scores ranged between 1.0 and 5.0 ($M_{\text{Mask}} = 2.86$; $SD_{\text{Mask}} = 1.24$).

Moderated Mediation

To determine whether mask-wearing mediates the relationship between anxiety about the coronavirus (independent variable) and feelings of control over one's health outcomes (dependent variable), a moderated mediation analysis was run using the bootstrapping method and Hayes (2018) PROCESS Model 7 (see Figure 2). PMI served as the moderator. The correlation matrix for each factor in the model appears in Table 1.

The omnibus model for state anxiety (the focal predictor) and PMI (the moderating variable) on mask-wearing was significant ($F(3,404) = 44.72$, $p < .0001$, $R^2 = 0.25$). There was a significant main effect of state anxiety on mask-wearing ($b = 0.5$ [$t = 5.86$], $p < .0001$); there was a significant main effect of PMI on mask-wearing ($b = 0.24$ [$t = 2.57$], $p = .01$); and there was a

² The significance of the results reported in the subsequent section does not change if all 12 situations are included.

significant interaction between state anxiety and PMI such that the relationship between state anxiety and mask-wearing is attenuated as PMI increases ($b = -0.04$ [$t = -2.27$], $p = .02$). See Table 4 for the regression results.

[Insert Table 4 about here]

When measuring feelings of control, the omnibus model was significant ($F(2,405) = 82.04$, $p < .0001$, $R^2 = 0.29$). A significant main effect was found for mask-wearing ($b = 0.35$ [$t = 5.1$], $p < .0001$). Anxiety about the coronavirus also had a significant main effect ($b = 0.35$ [$t = 7.78$], $p < .0001$). See Table 5 for the regression results.

[Insert Table 5 about here]

The effect of state anxiety on feelings of control was partially mediated by mask-wearing, [95% CI: -0.0302, -0.0025].

To examine the interaction between state anxiety and PMI, the indirect effects of mask-wearing on the relationship between state anxiety and control were examined at high ($b = 0.09$, 95% CI: 0.0509, 0.1375) and low ($b = 0.1283$, 95% CI: 0.0773, 0.1805) levels of PMI. See Figure 2 for a statistical diagram of these results. Taken together, these results support H_2 , H_3 , H_4 , H_6 , and H_7 .

[Insert Figure 2 about here]

DISCUSSION

Results from two studies identified the relationship between attitudes and behaviors related to mask-wearing, perceived marketplace influence (PMI), and emotional well-being (state anxiety and feelings of control over one's health outcomes) during the COVID-19 pandemic. In support of H₁, Study 1 found a significant negative relationship between anxiety about the coronavirus and feelings of control over one's health outcomes, and in line with H₅, that relationship was moderated by the response efficacy of masks, or one's belief that mask-wearing offers protection from the virus. Study 2 further explored the process underlying these findings and found that the relationship between state anxiety and restored feelings of control is mediated by the degree to which consumers wear masks, thereby supporting H₂, H₃, and H₄. Further, findings indicated, in support of H₆ and H₇, that the relationship between state anxiety and the propensity to wear a mask is moderated by PMI, or the belief that one's marketplace actions will influence others to engage in similar actions, which in turn, motivates individuals to engage in the behavior. In other words, our significant moderated mediation model suggests that because PMI is itself related to feelings of control (Leary *et al.*, 2019) and increases mask-wearing, it attenuates the relationship between state anxiety and mask-wearing. PMI is particularly relevant in the context of mask-wearing during the COVID-19 pandemic because mask-wearing is a public health behavior that is outwardly visible and can, therefore, influence other people to also wear a mask. Importantly, it is precisely others' mask-wearing that affords the greatest protection to individuals. Therefore, it would make sense that if consumers believe that their mask-wearing behavior will motivate others around them to wear masks, that belief will, in turn, motivate them

to wear a mask as a way to control their environment and their own health outcomes during the pandemic.

Theoretical Contributions, Implications, and Future Research

This research has important implications for marketing and public policy in the context of physical, emotional, and economic well-being during pandemics. First, results from Study 1 demonstrate how beliefs about the protective efficacy of mask-wearing moderate the relationship between state anxiety and feelings of control over one's health outcomes, highlighting the importance of messaging about the effectiveness of mask-wearing. At the beginning of the pandemic, however, public health and policy experts disseminated information about the benefits and risks of mask-wearing that was conflicting and confusing (Breslow, 2020; Peeples, 2020). In contrast to this response, our results suggest that it is important for public health and policy experts to offer clear messaging that is consistent with the latest scientific knowledge about the efficacy of mask-wearing across public health communications channels. For example, in addition to policy experts appearing on the news, public health marketers should focus on combatting the conflicting beliefs about mask-wearing by promoting the efficacy of the intervention through public service announcements (PSAs).

As early as May of 2020, several states, including Michigan, New York, and South Carolina, were running PSAs focused on the importance and role of mask wearing, social distancing, and hand washing in combatting the COVID-19 pandemic. Yet, there was little national effort to promote mask-wearing until February of 2021 when the CDC, Warner Bros., and the Ad Council launched a mask-wearing PSA (McHugh, 2021). Even then, however, the

PSAs that aired did not focus on *why* mask-wearing is an effective measure against the spread of COVID-19.

Given that understanding why public health recommendations work can increase perceptions of response efficacy (Witte and Allen, 2000), and given the results of Study 1—that beliefs about the response efficacy of mask wearing moderate the relationship between state anxiety and feelings of control over one’s health outcomes—we suggest that multi-channel messaging explaining and emphasizing the protective benefits of mask-wearing could help people regain a sense of well-being through feelings of control. It would be fruitful for future research to investigate the effectiveness of such PSAs in driving both beliefs about the efficacy of mask-wearing and, ultimately, mask-wearing behavior.

Second, across both studies, we examined the relationship between state anxiety about COVID-19 and downstream mental and physical health outcomes such as feeling in control of one’s health during the pandemic (Studies 1 and 2) and engaging in protective behaviors such as wearing a mask (Study 2). Specifically, we found that there is a significant inverse relationship between state anxiety and feelings of control and that state anxiety is significantly related to mask-wearing behavior. These findings are in line with both the Terror Management Health Model and Compensatory Consumer Behavior Model and demonstrate that compliance with public health recommendations can itself be a compensatory consumer behavior. Moreover, in line with the Terror Management Health Model, our results suggest that such behaviors may be motivated by anxiety and intended to restore control. At the outset of the pandemic, however, the U.S. government downplayed the threat of the coronavirus in order to avoid creating a panic (Keith, 2020). In contrast to this response, our results, in conjunction with existing theory (Witte and Allen, 2000), suggest that policy makers seeking to motivate mask-wearing should be

transparent and realistic about the danger posed by the virus, as anxiety can be a motivating driver in compliance with public health recommendations such as mask-wearing. Additionally, public health marketers could adopt messaging in ad campaigns and PSAs that draws on the anxiety triggered by the pandemic. This suggestion stands in contrast to the existing PSAs, which have an overwhelmingly positive tone. Moreover, given that little research has been conducted to examine the effectiveness of the existing PSAs with regard to increasing mask-wearing behavior [see Browder (2020) for an exception], it would be interesting for future research to explore the effectiveness of mask-wearing PSAs that use a positive appeal compared with those that use a fear appeal.

Indeed, significant extant research has been conducted in the area of fear appeals, finding that perceived threat and efficacy variables are important for driving compliance with public health recommendations [see Witte and Allen (2000) for a meta-analysis]. Our research extends these findings by introducing the efficacy-related construct of PMI into the public health domain. PMI is an individual difference variable, which like stable personality traits, is likely less susceptible to change when people are exposed to persuasive messaging. Thus, while messaging related to anxiety and the response efficacy of mask-wearing may be able to “nudge” the public toward engaging in preventative behaviors, achieving universal compliance with mask-wearing may require a mandate. Indeed, research has shown that such a policy could increase mask-wearing by an estimated 15% (Thorbecke, 2020).

Yet, in the U.S., the implementation of mask-wearing mandates has been slow. On January 29, 2021, nearly a year after the CDC reported the first case of COVID-19 in the U.S., and 9 months after the CDC first recommended that everyone wear a mask in public (Peeples, 2020), the CDC issued a federal mandate requiring all travelers to wear a mask while on public

transportation and while at transportation hubs such as airports and train stations (Centers for Disease Control and Prevention, 2021). This mandate followed President Biden's executive orders, requiring mask-wearing on federal property and while traveling (Hubbard, 2021). At the state level, as of February of 2021, there were still 16 states and territories in the U.S. without mask mandates, despite evidence that mask mandates decrease the spread of COVID-19 (Lyu and Wehby, 2020; Hubbard, 2021). For example, a comparison of the COVID-19 incidence rates between Kansas counties that implemented a mask mandate and those that did not implement a mask mandate provides correlational evidence that counties with a mask mandate saw a 6% decrease in COVID-19 incidence rates between June 1, 2020 and August 23, 2020, while those without a mask mandate saw a 100% increase in COVID-19 incidence rates across the same time period (Van Dyke *et al.*, 2020). Importantly, while policies related to prevention behaviors such as social distancing may actually increase stress and anxiety due to the isolation it entails (Panchal, 2020), our research suggests that mask-wearing regulations could be associated with more positive emotional well-being outcomes, particularly related to feeling in control of one's health outcomes.

Given our finding in the present research that mask-wearing mediates the relationship between anxiety and control, such mandates may be particularly important as other control mechanisms become available and state anxiety is reduced. For example, during the course of this research, a number of COVID-19 vaccines were developed and distributed. To the extent that the vaccine reduces state anxiety and increases feelings of control, people may be less motivated to wear a mask despite the fact that wearing a mask is likely still important for preventing the spread of the virus (Higgins-Dunn, 2021). At the same time, given our finding that mask-wearing is associated with feelings of control, when mask-wearing is adopted,

mandates for other preventative behaviors may need to be enacted. Indeed, as mask-wearing behaviors began to increase in the U.S. during the COVID-19 pandemic, other preventative measures such as social distancing were slow to follow or even saw a decline in compliance rates (Stein, 2020). Thus, public health policies and marketing (information remedies) related to both mask-wearing and other preventative behaviors should be considered simultaneously to elicit effective public health responses. In particular, information remedies may be useful when fully-informed individuals would make different choices in the interest of themselves and their families, while mandates may be preferable when information remedies are insufficient such as when they promote policies that people perceive as being controlling or impacting their freedom of behavior (Rosenberg and Siegel, 2018). In such cases, the benefit of a mandate may outweigh the costs to individuals' freedom of choice if the potential for negative externalities (e.g., spreading the virus to others during a pandemic) is high.

Importantly, future research should examine how such policy interventions affect mask-wearing and how the propensity to wear a mask changes over time as regulations and/or policy recommendations shift at the state and national levels. Additionally, it would be fruitful for future research to include in-depth qualitative data collection, exploring the various drivers of mask-wearing behavior. While the current paper focuses on state anxiety and efficacy constructs, particularly PMI, various factors (e.g., political affiliation, freedom, altruism, etc.) have been put forth as potential drivers influencing the adoption of and resistance to mask-wearing. It will be important for formal, academic research to investigate these many factors as well as others that influence mask-wearing.

Implications for Well-Being

Understanding the drivers of mask-wearing has important downstream benefits for physical, emotional, and economic well-being. First, substantial increases in public mask-wearing behavior could have a profound impact on public health by curbing the spread of the virus and, thereby, preventing deaths (Lyu and Wehby, 2020). Second, not only would universal mask-wearing save lives and potentially reduce anxiety by restoring a sense of control but also, it could prevent further economic decline (and the lives and livelihoods associated with that). Studies suggest that universal mask-wearing in the U.S. could prevent further economic lockdowns, which Goldman Sachs estimates could save the U.S. from losing an additional 5% of GDP, or about \$1 trillion (Aizenman, 2020; Cerullo, 2020). Such a loss at the macro level would translate into higher prices for individuals and households, the shuttering of small businesses, and greater unemployment (Bartik *et al.*, 2020; Cerullo, 2020). Even when lockdown orders are not in place, policy experts have pointed out that consumers may not feel comfortable resuming their pre-COVID-19 levels of consumption when it involves trips outside of the home (Polyakova *et al.*, 2020). Indeed, studies tracking smartphone data found that after initial lockdowns were lifted in the summer of 2020, daily visits to businesses were still down by 24% from the previous year (Valentino-DeVries *et al.*, 2020). Masks, policy experts suggest and our data show, could be one way of curbing consumer anxiety, increasing feelings of control, and increasing consumption to fuel the economy (Polyakova *et al.*, 2020). Of course, wearing face masks could also prevent individuals and families from accruing health care expenses due to contracting COVID-19 (Cerullo, 2020). In turn, such economic improvements could translate into greater emotional well-being, as the income insecurity, loss of jobs, and closures of schools

and daycare centers due to the coronavirus have all negatively impacted mental health, including by increasing levels of anxiety among both parents and students (Panchal *et al.*, 2020).

Importantly, the economic hardships (and associated mental health challenges) brought by the pandemic that many now face are the familiar normal to society's most vulnerable populations, and the pandemic has only exacerbated economic and emotional hardships for those people. The anxiety and loss of control (not to mention deaths) that U.S. Americans are facing due to COVID-19 are borne out disproportionately by the country's most marginalized communities (Hill, 2020). Therefore, it is important for future research to understand how mask-wearing could play a role in supporting not only the physical health but also the emotional and economic well-being of society's most vulnerable populations.

Limitations

The present research contains several limitations. First, the designs of both studies are correlational rather than causal. However, given the circumstances during this writing, it would not be ethical to run a randomized controlled experiment where half of the participants are not allowed to wear a mask. It would likely also be difficult, not to mention ethically questionable, to increase levels of anxiety about the virus or the efficacy of wearing a mask. Given the rise of fake news and echochambers (Iyengar and Massey, 2019), it would also be challenging to shift entrenched views about the virus and mask-wearing, and it could be dangerous to run conditions where the efficacy of masks is challenged.

A second limitation is that the behavioral mask-wearing variable is self-reported and could be impacted by social desirability and/or an inability to accurately recall how often one

actually wears a mask. However, with social distancing requirements, observational studies that would then involve an intercept survey to assess the other variables are not possible in the current climate. Nonetheless, prior research has shown that self-reported data are likely accurate when the questions are clear and when responses are anonymous (Brener *et al.*, 2003). Thus, we pilot tested our surveys to ensure that our questions were easily understood, and we administered the survey through an online platform that kept respondents' identities anonymous. In addition, given the variance in our sample's responses, and given that the mask-wearing averages in our study are consistent with data from national syndicated sources (Kramer, 2020), there is little reason to believe that participants were misleading in their responses.

CONCLUSION

Despite initial hesitation among members of the medical community in the West, a significant body of research conducted since that time has produced compelling evidence for the efficacy of mask-wearing in curbing the spread of COVID-19. Nonetheless, compliance with this public health recommendation in the U.S. has been mixed. Our research provides support for the relationship between mask-wearing, PMI, and emotional well-being and bears implications for how marketers and public policy experts may be able to increase the level of mask-wearing. Such a shift in behavior at the societal level could have important effects on physical health, emotional well-being, and economic outcomes.

APPENDIX

The survey questions used in Studies 1 and 2 may be found online in the Web Appendix.

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TABLE 1

Study 1 and Study 2 Correlation Matrices of Variables in the Regression Models

Study 1					
Variable	1	2	3	4	5
1 Trait Anxiety	-				
2 Need for Control	-.27***	-			
3 State Anxiety	.33***	-.10*	-		
4 Belief-in-Mask-Wearing	.07	-.01	.47***	-	
5 Feelings of Control	-.18**	.18**	-.26**	-.10	-
Study 2					
Variable	1	2	3	4	
1 State Anxiety	-				
2 PMI	.18**	-			
3 Mask-Wearing	.49***	.14**	-		
4 Feelings of Control	.49***	.31***	.43***	-	

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

TABLE 2
Study 1 Regression Results

Variable	<i>b</i> (SE)	<i>t</i>	<i>p</i>
Trait Anxiety	-0.02 (.02)	-1.19	0.23
Need for Control	0.25 (.10)	2.55	0.01**
State Anxiety	-0.19 (.05)	-4.14	< 0.0001***
Belief-in-Mask-Wearing	0.09 (.06)	1.42	0.15
State Anxiety * Belief-in-Mask-Wearing	0.06 (.02)	2.45	0.01**
Model statistic			
N = 404			
df (5, 398)			
F – value 9.73			
F – sig $p < .0001$ ***			

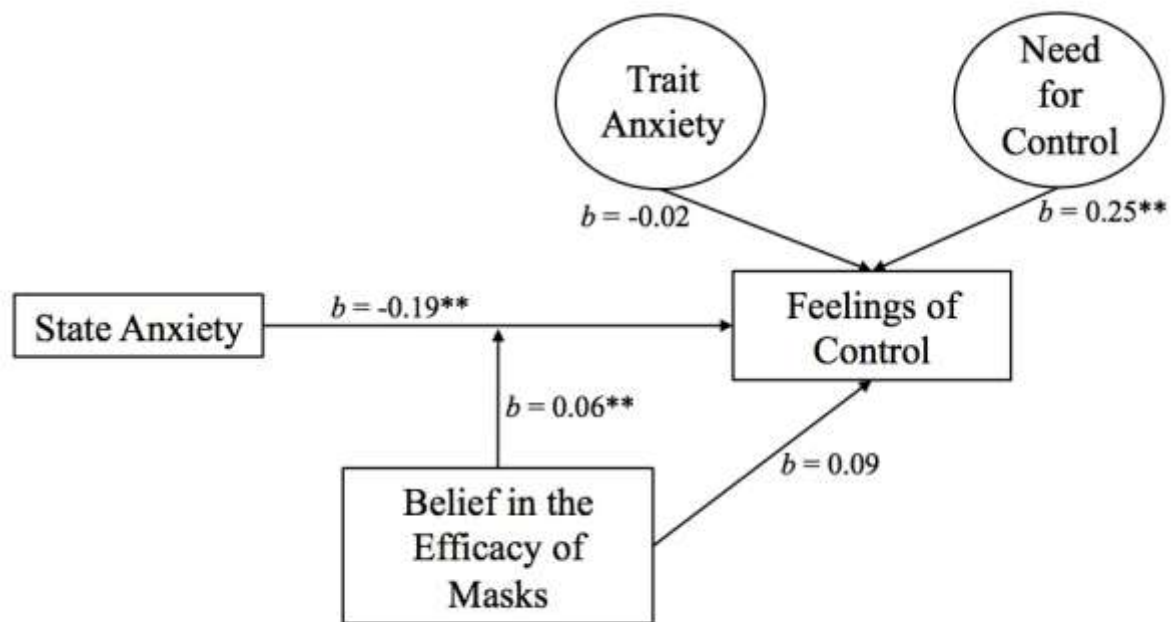
Dependent Variable: Feelings of Control Over One's Health Outcomes During the COVID-19 Pandemic.

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

b = unstandardized regression coefficient.

Predictor variables are flush left; control variables are indented.

FIGURE 1
Moderation Analysis in Study 1



Note: Values indicate unstandardized regression coefficients, controlling for other variables in the model. $*p < .05$; $**p < .01$. State anxiety served as the independent variable, feelings of control served as the dependent variable, and belief in the efficacy of masks served as the moderator. Trait anxiety and need for control were covariates (control variables). Arrows show the statistically modeled relationship between the variables measured.

TABLE 3
Mask-Wearing Scenarios

Situation	Description	Mean Mask Wearing	# Respondents selecting “I am never in this situation”
1	Alone, At home	1.1*	4
2	Alone, Outside	2.7	4
3	Alone, in Public building	4.5**	31
4	With Pod, At home	1.3*	22
5	With Pod, Outside	2.5	13
6	With Pod, in Public building	4.4**	27
7	With Public, At home, Socially distanced	2.2	85
8	With Public, Outside, Socially distanced	3.3	5
9	With Public, in Public building, Socially distanced	4.6**	7
10	With Public, At home, Not socially distanced	2.5	101
11	With Public, Outside, Not socially distanced	3.6	23
12	With Public, in Public building, Not socially distanced	4.4**	16

* indicates a floor effect

** indicates a ceiling effect

TABLE 4
Study 2 Regression Analysis Predicting Self-Reported Mask-Wearing Behavior

Variable	<i>b</i> (SE)	<i>t</i>	<i>p</i>
State Anxiety	0.5 (.08)	5.86	< 0.0001***
PMI	0.24 (.09)	2.57	0.01**
State Anxiety * PMI	-0.04 (.02)	-2.27	0.02*
Model statistic			
N = 408			
df (3, 404)			
F – value 44.72			
F – sig $p < .0001$ ***			

Dependent Variable: Self-Reported Mask-Wearing Behavior.

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

b = unstandardized regression coefficient.

TABLE 5

Study 2 Regression Analysis Predicting Feelings of Control Over One's Health Outcomes When Wearing a Mask During the COVID-19 Pandemic.

Variable	<i>b</i> (SE)	<i>t</i>	<i>p</i>
State Anxiety	0.35 (.04)	7.78	< 0.0001***
Mask-Wearing	0.35 (.07)	5.10	< 0.0001***
PMI Index of moderated mediation	-0.01 (.007)	[-0.03, -0.0025]	
Model statistic			
N = 408			
df (2, 405)			
F – value 82.04			
F – sig $p < .0001$ ***			

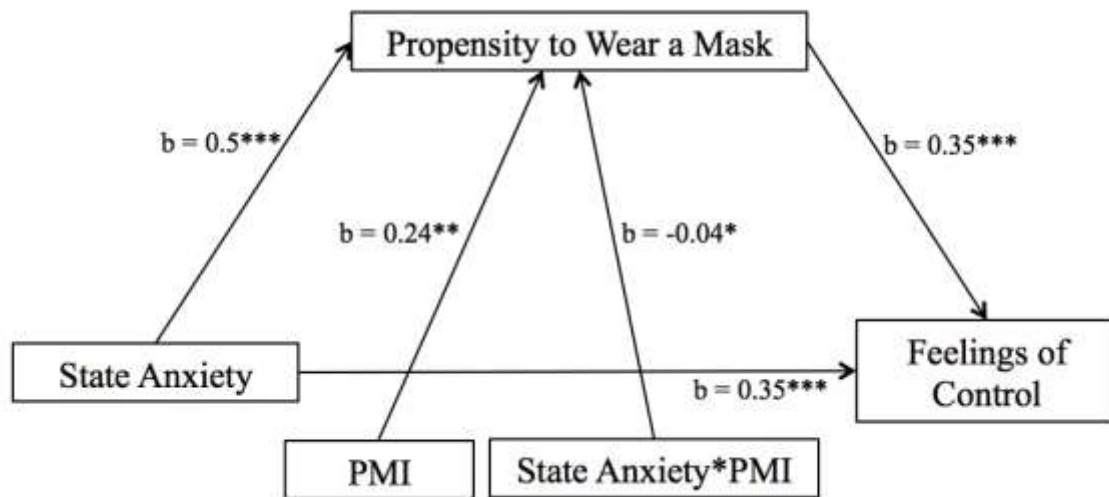
Dependent Variable: Self-Reported Mask-Wearing Behavior.

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

b = unstandardized regression coefficient.

FIGURE 2

Study 2 Moderated Mediation: Hayes (2018) PROCESS Model 7



Note: Values indicate unstandardized regression coefficients, controlling for other variables in the model. $*p < .05$; $**p < .01$; $***p < .001$. Anxiety about the coronavirus served as the independent variable, feelings of control served as the dependent variable, propensity to wear a mask served as the mediator, and PMI served as the moderator. Arrows show the statistically modeled relationship between the variables measured and predicted direction of impact based on extant theory.