**Original Research**

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# Social Distancing in the Context of COVID-19 Anxiety: A Social Cognitive Approach

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## Abstract

As the impact of COVID-19 continues, engagement in social distancing is essential. Using Social Cognitive Theory, the current study examined the unique roles of COVID-19 anxiety and self-efficacy on the relationships between information-seeking and risk perception as predictors of social distancing intention. A convenience sample of 960 adults (M = 37.81 years, SD = 11.65) completed an author-designed online survey. Participants completed measures on behavioral intention, information-seeking, risk perception, COVID-19 anxiety, and self-efficacy. Moderated mediations examined the theoretically proposed relationships among the variables. COVID-19 anxiety moderated the relationship between risk perception and self-efficacy, but not the association between information-seeking and self-efficacy. Self-efficacy mediated the role of risk perception and information-seeking on behavioral intent. Self-efficacy was strongly associated with social distancing intention, consistent with previous research and underscoring the need to identify factors influencing self-efficacy in the context of a pandemic. Risk perception and information-seeking both directly and indirectly related to intention to social distance, with COVID-19 anxiety dampening the influence of perceived risk on self-efficacy. The roles of risk perception and information-seeking in relation to self-efficacy suggest the need to adequately describe risk, reduce pandemic-related anxiety, and provide accurate, transparent information.

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# Introduction

The novel coronavirus disease 19 (COVID-19) pandemic has been labeled a serious global health threat by the Centers for Disease Control and Prevention (CDC, 2020a). As of the end of October 2020, documented cases in the United States have exceeded 8.7 million (CDC, 2020b) and over 44 million cases have been confirmed globally by the World Health Organization (WHO, 2020). With positive cases continuing to increase and widespread COVID-19 information circulating, these factors have the potential to influence information-seeking practices, risk perception, and anxiety surrounding COVID-19 (Dryhurst et al., 2020; Farooq et al., 2020). In light of COVID-19 knowledge and stress, psychosocial variables, such as self-efficacy (SE), may play a pivotal role in the public's adopting precautionary behavioral intentions and behaviors (e.g., Dryhurst et al., 2020; Farooq et al., 2020). The present study was an investigation into the potential interrelationships among these variables at the rise of the pandemic in a sample of U.S. adults.

## Increasing Preventive Health Behaviors During COVID-19

Transmission of COVID-19 occurs mainly during close person-to-person contact, with the CDC emphasizing the importance of avoiding exposure to prevent contracting the virus (CDC, 2020a). To limit the spread of the virus, preventive measures such as social distancing have been strongly encouraged and implemented (WHO, 2020). Engaging in social distancing practices and mask-wearing were the most frequent preventive health behaviors among participants in a recent COVID-19 study (Yıldırım & Güler, 2020), which is consistent with preventive health behaviors during the 2009 H1N1 pandemic as well (Bults et al., 2015). Despite widely-circulated information on the benefits and safety behind preventive health behaviors, not everyone engages in these practices (Yıldırım & Güler, 2020). To increase the occurrence of these preventive health behaviors then, researchers should consider other factors, such as SE, knowledge, and risk perception, that are strong prerequisites to establishing a motivated health behavior change (Cori et al., 2020; Renner et al., 2008; Schwarzer & Renner, 2000).

## Social Cognitive Theory on Self-Regulatory Processes

According to Bandura's Social Cognitive Theory (SCT), people are active agents who control their individual behaviors (Bandura, 2001). Agency includes not only intentionality in behavior, but also forethought and self-regulation, which help people set goals for the future, motivate themselves, and act in ways that lead to the goal behavior. SE, or a person's belief in their abilities (Bandura, 1977, 1982), however, provides the foundation for agentic properties. (Bandura, 1982, 2001). Believing in one's abilities to succeed is considered the driving mechanism for intentional behaviors, forethought, and self-regulatory processes. Bandura notes that without strong SE, one is not compelled to work towards the goal, especially if it is challenging.

There are many ways to increase SE, including verbal persuasion, social modeling, and using physiological cues (Bandura, 1982, 2008). Hearing information from others, especially when it explicitly relates to oneself, can increase personal beliefs in one's own abilities. Additionally, people learn by observing others, so seeing another person succeed can increase one's own SE (Bandura, 1982, 1994). Current emotional state also can affect SE. Bandura (2008) explains that feeling uncertain, stressed, or down can negatively impact how one

views their abilities, especially when feeling vulnerable. Furthermore, this low mood can negatively affect goal-setting and goal achievement, too. Thus, considering the current COVID-19 pandemic, it is important to view not only the preventive health behaviors and intentions, but also factors that influence the behavior and intention.

## Applying SCT to Explain COVID-19 Behaviors

### Self-Efficacy

SE, being a subjective assessment of abilities, can impact one's behaviors, thoughts, and emotions, as well as goal-setting and goal-striving processes (Bandura, 1977, 1997). Notably, factors, including past experiences, observations, emotions, and information, can influence SE in a positive or negative way (Bandura, 1977, 1982, 2008). SE has the capacity to change across the life span and, because of the connection to human agency, SE often has been linked to health behavior changes (e.g., Lo et al., 2015; Sheeran et al., 2016). For example, the previous literature consistently has found that SE is causally linked to behavioral intentions, as well as the intended behavior (Lo et al., 2015; Sheeran et al., 2016), such that as SE increases, behavioral intentions increase, and the goal behavior is also more likely to be reached.

Although the COVID-19 literature on SE and preventive health behaviors is limited, Yıldırım and Güler (2020) concluded that SE was positively associated with preventive health behaviors. Furthermore, SE was found to directly predict intention to self-isolate in another study (Farooq et al., 2020). Much of the COVID-19 literature focuses on SE among essential workers, so additional literature that explores SE among the general public during COVID-19 is necessary.

Despite the shortage of SE literature surrounding the COVID-19 pandemic, related findings from the 2009 H1N1 pandemic and chronic health condition literature can be considered to better understand SE in the context of the current pandemic. During the H1N1 pandemic, the general public reported relatively high levels of SE to engage in preventive health behaviors, such as increasing hand-washing behaviors (Bults et al., 2015). Also, during the H1N1 pandemic, multiple studies concluded that SE was a significant predictor of preventive health behavioral intention (Cho & Lee, 2015; Smith et al., 2016). Similarly, in the chronic health condition literature, SE has been found to be a significant predictor of behavioral intentions (Luszczynska & Schwarzer, 2003; Schwarzer & Renner, 2000) and engaging in health-promoting behaviors as well (Lo et al., 2015; Luszczynska & Schwarzer, 2003; Rimal, 2001; Schwarzer & Renner, 2000). Furthermore, Maguire et al. (2019) concluded that participants were more likely to engage in preventive health behaviors when SE was high. Despite the different contexts of these various studies, the findings consistently note that maintaining high SE is important for the behavioral outcome.

### COVID-19 Risk Perception

Risk perception, which refers to one's evaluations of potential threats, is often assessed by feelings of vulnerability (e.g., perceived vulnerability) and severity of the event (e.g., perceived severity; Cho & Lee, 2015). Risk perception was a significant predictor of social distancing in one early COVID-19 study (Abdelrahman, 2020). In a recent publication, the risk perception of COVID-19 was greater among participants who had direct experience with the virus (Dryhurst et al., 2020). Research prior to COVID-19, however, is mixed on whether having a higher risk perception is linked to an increase or decrease in preventive health behaviors (Schwarzer & Renner, 2000; van de Pligt, 1996). With feelings of helplessness, people do not often follow preventive behaviors even with high-risk perception (van de Pligt, 1996).

Based on over 70 studies from across the world, research shows that perceived vulnerability of developing H1N1 was highest during the early and pandemic peaks of the disease, followed by a decline. Relatedly, declining trends were reported for the perceived severity of the pandemic (Bults et al., 2015). H1N1 perceived severity was a significant predictor of preventive health behavioral intention; however, perceived vulnerability to contracting H1N1 was not predictive of preventive health behavioral intention (Cho & Lee, 2015). Rimal

(2001) concluded that those people with high perceived risk and high SE engaged in preventive health behaviors most often, whereas those with low perceived risk and low SE engaged in preventive health behaviors the least often. Knowing people who contracted H1N1 predicted preventive health behavioral intention (Cho & Lee, 2015) and also was associated with vaccination (Lin et al., 2014). Despite the fact that the results are mixed for risk perception predicting preventive health behavioral intention and engagement, the literature suggests that SE may be an important component in the association between risk perception and health behavior. What remains unclear, however, is the influence of risk perception on whether one feels more or less efficacious in their health prevention behaviors. This is where the influence of other factors may moderate whether one perceives increased risk as motivating or debilitating to their perceived sense of efficacy.

## COVID-19 Information

Actively seeking COVID-19 information also can impact engagement in preventive health behaviors. Farooq et al. (2020) found that engaging in obsessive online searching for COVID-19 information indirectly influenced the self-isolation intention through risk perception. Additionally, information overload, which stems from excessive information intake and results in an ineffective information search, was indirectly associated with self-isolation partially through SE. The link between information overload and SE suggests that as the excessive intake of COVID-19 information increases, SE decreases. Factors such as emotions and information affect SE (Bandura, 1977, 1982, 2008), so the excessive information, along with any accompanying emotions from the information overload, likely explains this negative association. Additionally, it is not surprising that social media use was positively associated with obsessive online searching and information overload (Farooq et al., 2020).

According to the H1N1 pandemic literature, people were generally well-informed about H1N1 and how it spread (Bults et al., 2015). A study in Germany that included over 13,000 participants found that the majority reported seeking H1N1 information from conventional media sources, such as television, radio, and newspapers rather than seeking information from the internet (Walter et al., 2012). The prominence of more conventional sources over the internet has been documented elsewhere, too (Ibuka et al., 2010; Lin et al., 2014). One systematic review found engaging in information-seeking behaviors to be positively associated with H1N1 vaccination (Lin et al., 2014).

More studies are needed to better understand the connection between seeking out COVID-19 information, having that information, and implementing preventive health behaviors. However, the H1N1 literature (e.g., Lin et al., 2014) and the Farooq et al. (2020) findings suggest that, similar to the conclusion made with the risk perception–health behavior pathway, SE may play an important role in the link between COVID-19 information seeking and health behavior engagement.

## COVID-19 Anxiety

Along with personal concern of contracting a serious illness, public health recommendations have emphasized the role that each person has to protect themselves and the larger population (e.g., CDC, 2020a), which could add unease. It was posited during prior pandemics that these stressors may negatively affect the public through feelings of vulnerability and increased anxiety (Bults et al., 2015). Thus, it is not surprising that in the wake of serious health events, risk perception (Kashiwazaki et al., 2020), which includes perceived vulnerability, and information-seeking behaviors (McMullan et al., 2019; Weaver et al., 2010) were associated with anxiety. Similarly, the COVID-19 pandemic also has negatively affected mental health. A recent meta-analysis concluded that anxiety about COVID-19 has increased globally, with roughly 32% of the 63,439 participants reporting anxiety (Salari et al., 2020). Beyond the articles in the meta-analysis, this COVID-19 anxiety finding has been documented elsewhere as well (Özdin & Özdin, 2020).

Findings from Trougakos et al. (2020) indicated that COVID-19 anxiety predicted an increase in emotion suppression, which means participants stifled their emotions and were not properly dealing with their

emotional needs. The current literature also suggests that both anxiety (Hayes, 2004) and emotion suppression are associated with avoidant behaviors (Butler et al., 2007; Hayes, 2004). Based on the work by Bandura (2008), stress and uncertainty negatively affect how people view themselves, so these feelings and behaviors may indeed be detrimental to SE. Considering this connection to SCT, it is not surprising that COVID-19 anxiety appears to be lower among people with high SE (Shacham et al., 2020). This negative association between anxiety and SE has been documented in other serious health situations, too (e.g., Mystakidou et al., 2010; Tan-Kristanto & Kiropoulos, 2015).

Researchers examining emotions during the H1N1 pandemic found that H1N1 anxiety varied greatly across the world, such that anxiety levels were low among Dutch participants, but high among Australian participants (Bults et al., 2015). American participants generally experienced high anxiety about contracting H1N1; however, the anxiety surrounding the H1N1 pandemic followed a common declining trend as the threat of H1N1 became less immediate. Multiple H1N1 studies concluded that higher levels of H1N1 anxiety predicted engagement in preventive health behaviors (Liao et al., 2010; Lin et al., 2014; Smith et al., 2016). Additionally, H1N1 anxiety was associated with information-seeking behaviors and risk perception (Kim & Niederdeppe, 2013). Coupled with this finding and those from various health contexts (e.g., Kashiwazaki et al., 2020; McMullan et al., 2019), these variables appear to be consistently related.

## Current Study

The magnitude of the COVID-19 pandemic continues to grow and the fact that vaccine distribution was still slow reemphasizes the importance of engaging in preventive health behaviors. The early COVID-19 literature and previous H1N1 research findings have demonstrated significant connections between risk perception and information-seeking behaviors and intention and engagement in preventive health behaviors. Because of the emphasis on human agency, SE also appears to be an important driving force for successful health behavior intention and engagement. Although the literature consistently notes the positive association between SE and preventive health behaviors, it is still unclear how SE is affected by information-seeking and risk perception. Additionally, COVID-19 anxiety has the potential to negatively affect the relationships between COVID-19 information seeking and risk perception to SE as it may alter the motivating potential behind these variables.

The goal of this study was built on the premise of Bandura's SCT, examining the unique roles of COVID-19 anxiety and SE on the relationships between information-seeking and risk perception as predictors of social distancing intention. To examine these relationships, the current study tested a moderated mediation in which SE mediated the effects of COVID-19 information seeking and risk perception on social distancing intention and included COVID-19 anxiety as a potential moderator of the information-seeking-SE and risk perception-SE pathways. We hypothesized that 1) information-seeking and risk perception would be associated with SE, such that the action of gathering information on COVID-19 would be positively associated with SE; however, due to previously mixed findings, no direction was specified in reference to COVID-19-risk perception and SE; 2) SE would significantly mediate the information-seeking-social distancing intention and risk perception-social distancing intention pathways; and 3) COVID-19 anxiety would be a significant moderator of the information-seeking-SE and risk perception-SE pathways, altering the relationships by either dampening or amplifying their influence on SE. Due to sociodemographic differences in susceptibility to COVID-19 (CDC, 2020c; Kopel et al., 2020) and reported COVID-19 anxiety and stress (Barzilay et al., 2020; Lee et al., 2020), race, gender, and age were included as covariates in the model.

# Methods

## Participants

Amazon's Mechanical Turk (MTurk) was used to recruit participants. Eligibility requirements included being registered as an MTurk "worker," a HIT (Human Intelligence Task) approval rating of 95 or better, and an US-originating IP address. A setting in Qualtrics, which was the survey system used for administration, prohibited repeat responses and data were screened for duplicate IP addresses. The final sample ($N$ = 960) was derived after removing participants who failed more than two attention checks ($n$ = 42) and those with 5% or more missing data ($n$ = 38). The average age of the sample was 37.81 years ($SD$ = 11.65 years, range 18–73 years). The majority identified as men (59.4%) and White (71.5%). As is common with MTurk samples (e.g., Chandler et al., 2019), the majority of participants reported higher educational attainment (64.7% at the level of at least a Bachelor's degree) compared to the general population; most were employed at least part-time (91.1%). Forty-six participants (4.8%) reported being diagnosed with COVID-19. Table 1 provides a full breakdown of the sample demographics.

**Table 1:** *Sample Demographics*

|  | *Percentage* | *M* | *SD* | Range |
|---|---|---|---|---|
| **Age** |  | 37.81 | 11.63 | 18–73 |
| **Gender** |  |  |  |  |
| % Man | 59.4 |  |  |  |
| % Woman | 40.4 |  |  |  |
| % Transgender or non-binary | .2 |  |  |  |
| **Race and Ethnicity** |  |  |  |  |
| % White | 71.5 |  |  |  |
| % Black or African American | 13.2 |  |  |  |
| % Asian | 6.3 |  |  |  |
| % Hispanic or Latino | 5.0 |  |  |  |
| % Bi-racial or multi-racial | 2.1 |  |  |  |
| % American Indian or Alaskan Native | 1.4 |  |  |  |
| % Middle Eastern | .3 |  |  |  |
| % Native Hawaiian or Pacific Islander | .2 |  |  |  |
| **Education** |  |  |  |  |
| % Did not graduate high school | .3 |  |  |  |
| % High school diploma or GED | 10.4 |  |  |  |
| % Some college | 13.6 |  |  |  |
| % Associate's degree | 11.0 |  |  |  |
| % Bachelor's degree | 48.0 |  |  |  |
| % Master's degree | 14.5 |  |  |  |
| % Doctoral or professional degree | 2.2 |  |  |  |
| **Employment** |  |  |  |  |

| | |
|---|---|
| % Full-time | 73.3 |
| % Part-time | 9.5 |
| % Retired or transitioning | 2.3 |
| % Self-employed | 7.2 |
| % Unemployed | 7.7 |

## Measures

At the time of research design (late March 2020), standard measures pertinent to beliefs, feelings, and behavior related to COVID-19 were not readily available. Using the health beliefs model as a theoretical framework, we created the following measures guided by existing measures as applicable to preventative health beliefs and behavior (Gözüm & Aydin, 2004; Vernon et al., 1997). An issue in the measurement of health beliefs (Champion & Skinner, 2008) is the need for customization to the specific prevention behavior under study. Given the context of the pandemic, these measures were further adapted using previous research on other pandemic-scale illnesses (e.g., Ashbaugh et al., 2013; Huang et al., 2011; Myers & Goodwin, 2011; Setbon & Raude, 2010) and supplemented with media and governmental recommendations available at the time.

Items were initially selected to provide the best coverage of the health belief model concepts (i.e., perceived severity; perceived susceptibility; perceived benefits; perceived barriers; self-efficacy; behavioral intention; and cues to action), drawn from the different sources of reference (i.e., HBM measures for preventative behaviors, related pandemic-related beliefs and behaviors, and present guidance and public beliefs reported from news outlets). An initial goal was to have multi-item measures to improve on the limitations of commonly used single-item measures. Refinement based on psychometric properties (e.g., reliability, factor structure) occurred post-hoc. In this investigation, all behavioral intention and SE items were retained given strong psychometric performance as a single factor scale. Information seeking, risk perception, and COVID-19 anxiety were drawn from available items and evaluated based on psychometric properties. Each is described below.

### Behavioral intention
Eleven items were developed to assess intention to social distance (e.g., "I intend to self-isolate for the recommended duration if there is a chance I have been in contact with someone with COVID-19"). Participants rated their agreement with each statement ranging from *strongly disagree* (1) to *strongly agree* (5). Six of the items were reverse-coded prior to averaging scores over the 11 items. Higher scale scores reflected greater behavioral intent ($M = 3.96$, $SD = .75$). Scale reliability was good ($\alpha = .84$).

### Information seeking
Information seeking was measured with nine items that were originally included as cues to action, representing active engagement in COVID-19 information gathering. These items included keeping up with guidelines and recommendations from government agencies; watching press briefings from national, state, and local officials; consuming third-party media reports; sharing resources; and talking with others. Participants marked whether they were engaging in each of the nine activities (e.g., "Please indicate which of the following experiences you have had: Consuming third-party media reports (newspaper, television, social media)"). These marks were tallied, ranging from 0 to 9, such that those with higher scores had more active COVID-19 information gathering ($M = 4.72$, $SD = 2.28$, $\alpha = .71$).

### Risk perception
Risk perception items were also drawn from cues to action and calculated based on the incidence of hearing

about COVID-19-related deaths. Participants were asked to report by checking a box whether they heard of (1) someone their own age, (2) someone older than them, and (3) someone younger than them dying from COVID-19 complications (e.g., "Please indicate which of the following experiences you have had: Heard of someone your age dying of COVID-19 complications"). These checks were tallied, ranging from 0 to 3, such that those with higher scores had greater risk perception ($M = 1.60$, $SD = 1.28$, $\alpha = .82$).

### COVID-19 anxiety

COVID-19 anxiety was assessed with three items ("The thought of COVID-19 scares me," "When I think about COVID-19, I feel anxious," and "I am afraid when I think about contracting COVID-19") drawn from the perceived severity items as the only three items to explicitly reference the emotional threat of COVID-19. Other severity items focused on specific impacts due to COVID-19 and did not at face value represent anxiety. Participants indicated the degree to which they agreed with the statements on a 5-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). These items were averaged with high scale scores indicating greater COVID-19-related anxiety ($M = 3.47$, $SD = 1.16$, $\alpha = .90$).

### Self-Efficacy

SE was assessed with 20 items rated on the same 5-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). The SE items were developed to focus specifically on perceived capability to engage in social distancing, including items such as "I am capable of being self-sufficient while social distancing" and "I am able to social distance by using technology in place of face-to-face meetings or visits." Scores were averaged and higher scale scores represented a higher degree of SE ($M = 4.20$, $SD = .65$) in the face of challenges stemming from social distancing as a prevention method. Scale reliability was good ($\alpha = .93$).

## Procedures

Data for this cross-sectional survey were collected in mid-April 2020. A convenience sample was recruited through MTurk, a crowd-sourcing website, to participate in a survey assessing health beliefs and behaviors during the rise of the COVID-19 pandemic. MTurk has been demonstrated to be a source of equivalent quality compared to other recruitment methods (see Follmer et al., 2017). Once participants completed the informed consent, participants were presented questions related to health, motivation, beliefs, and behaviors in response to COVID-19, beliefs about aging, and motivation to participate in religious activities. Demographic questions concluded the survey. Participants averaged 15 minutes to complete the survey and were compensated $2 USD for their efforts. Links to COVID-19 resources were provided at the conclusion of the survey. Research was conducted in compliance with APA ethical standards, with approval of Northern Kentucky University's Institutional Review Board (protocol #988).

## Analytical Strategy

With less than 1% of scores missing for any given question, mean imputation was conducted if a participant had completed at least 75% of the questions. PROCESS (Hayes, 2012) was used to test a moderated mediation, examining whether COVID-19 anxiety moderated the effect of risk perception and information-seeking on SE, as well as SE's mediating role of risk perception and information-seeking on behavioral intention, with race (coded as POC/white), gender (man/woman), and age (continuous) included as covariates. PROCESS was adopted over traditional methods of testing because it allowed for 5,000 bias-corrected boot-strapping samples, which increases the stability of the beta weights, and continuous variables are automatically mean-centered, which ensures assumptions of generalized linear models were not violated (Hayes, 2012). See Figure 1a and Figure 1b for proposed conceptual models.

**Figure 1:** *Proposed Conceptual Models Based on Social Cognitive Theory*
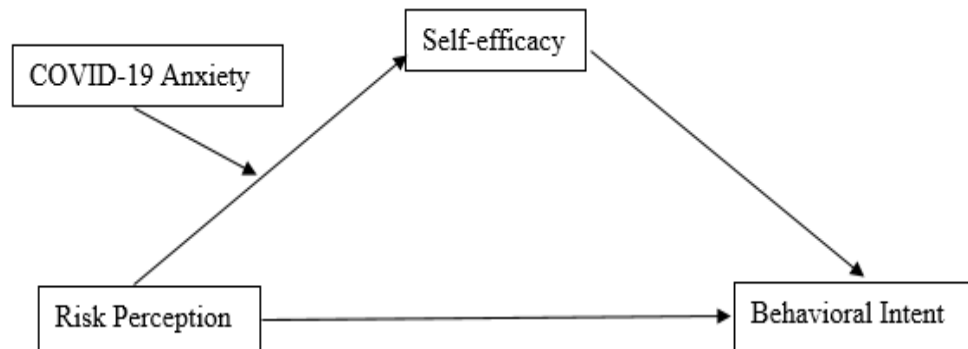


**Note 1a**. The proposed conceptual model based on SCT with risk perception as an environmental variable interacting with and influencing person factors (i.e., COVID-19 anxiety and self-efficacy) in turn influencing behavioral intentions.
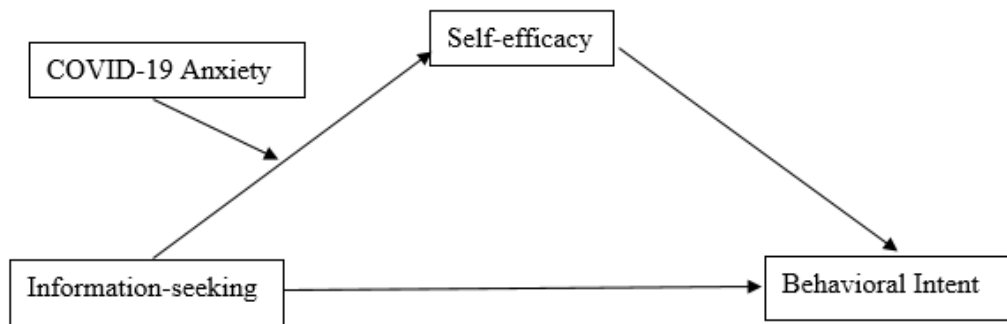


**Note 1b**. The proposed conceptual model based on SCT with information seeking as an environmental variable interacting with and influencing person factors (i.e., COVID-19 anxiety and self-efficacy) in turn influencing behavioral intentions.

**Table 2:** *Mean, Standard Deviations, and Pearson Correlations of Study Variables*

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Behavioral intentions (*M* = 3.96, *SD* = .75) | - | - | - | - | - | - | - |
| 2. Risk perception (*M* = 1.60, *SD* = 1.28) | .25** | - | - | - | - | - | - |
| 3. Information-seeking (*M* = 4.72, *SD* = 2.28) | .33** | .32** | - | - | - | - | - |
| 4. COVID-19 anxiety (*M* = 3.47, *SD* = 1.16) | .23** | .14** | .15** | - | - | - | - |
| 5. COVID-19 self-efficacy (*M* = 4.20, *SD* = .65) | .63** | .18** | .25** | .20** | - | - | - |
| 6. Age (*M* = 37.81, *SD* = 11.65) | .13** | .10** | .10** | .02 | .13** | - | - |
| 7. Gender (coded as 0:Man; 1:Woman) | .21** | .16** | .15** | .13** | .10** | .21** | - |
| 8. Race (coded as 0:POC; 1:White) | .11** | .17** | .08* | -.09** | .02 | .18** | .06* |

**Note**. ** Correlation is significant at the .01 level; * correlation is significant at the .05 level

# Results

To ascertain the associations between behavioral intentions, risk perception, information-seeking behaviors, COVID-19 anxiety, and SE, Pearson bivariate correlations and Kendell's $t$ (for count variables) were examined. Behavioral intentions were significantly associated with information seeking ($r_\tau(950) = .33$, $p = .00$), risk perception ($r_\tau(948) = .25$, $p = .00$), COVID-19 anxiety ($r(959) = .23$, $p = .00$), and SE ($r(960) = .63$, $p = .00$). Information seeking was significantly associated with risk perception ($r_\tau(939) = .32$, $p = .00$), COVID-19 anxiety ($r_\tau(949) = .15$, $p = .00$), and SE ($r_\tau(950) = .25$, $p = .00$). Risk perception was significantly associated with COVID-19 anxiety ($r_\tau(947) = .14$, $p = .00$), and SE ($r_\tau(948) = .18$, $p = .00$). COVID-19 anxiety was significantly associated with SE ($r(959) = .20$, $p = .00$). See Table 2 for all correlations and descriptive statistics.

## Risk Perception

A moderated mediation was examined to determine whether a person's risk perception was moderated by COVID-19 anxiety on SE, and if SE mediated the relation of a person's risk perception on behavioral intent. Because age, gender, and race were significantly associated with risk perception and behavioral intent through bivariate associations, they were used as control variables. In the equation examining whether COVID-19 anxiety moderated the effects of risk perception on SE, an omnibus effect was detected [$F(6, 928) = 16.95$, $p = .00$, $R^2 = .10$]. Risk perception [$b = .10$, $t(928) = 6.18$, $p = .00$], COVID-19 anxiety [$b = .09$, $t(928) = 5.11$, $p = .00$], and the interaction [$b = -.03$, $t(928) = -2.41$, $p = .02$] all uniquely contributed to the overall effect on SE. By examining the conditional effects, we found that at low levels of COVID-19 anxiety for a one-unit increase in risk perception, there is a 0.14 increase in SE [$b = .14$, $t(928) = 6.33$, $p = .00$]. At average levels of COVID-19 anxiety, for a one-unit increase in risk perception, there is a 0.10 increase in SE [$b = .10$, $t(928) = 6.18$, $p = .00$]. At high levels of COVID-19 anxiety, for a one-unit increase in risk perception, there is a 0.06 increase in SE [$b = .06$, $t(928) = 2.77$, $p = .01$]. See Figure 2 for the interaction of COVID-19 anxiety and risk perception on SE. Examining the mediating role of SE on risk perception and behavioral intent, there was an overall significant effect [$F(5, 929) = 149.13$, $p = .00$, $R^2 = .45$]. Both risk perception [$b = .09$, $t(929) = 6.19$, $p = .00$] and SE [$b = .68$, $t(929) = 22.80$, $p = .00$] significantly contributed to behavioral intent.

**Figure 2:** *Graph of the Interaction Between Risk Perception and COVID-19 Anxiety on Self-Efficacy*
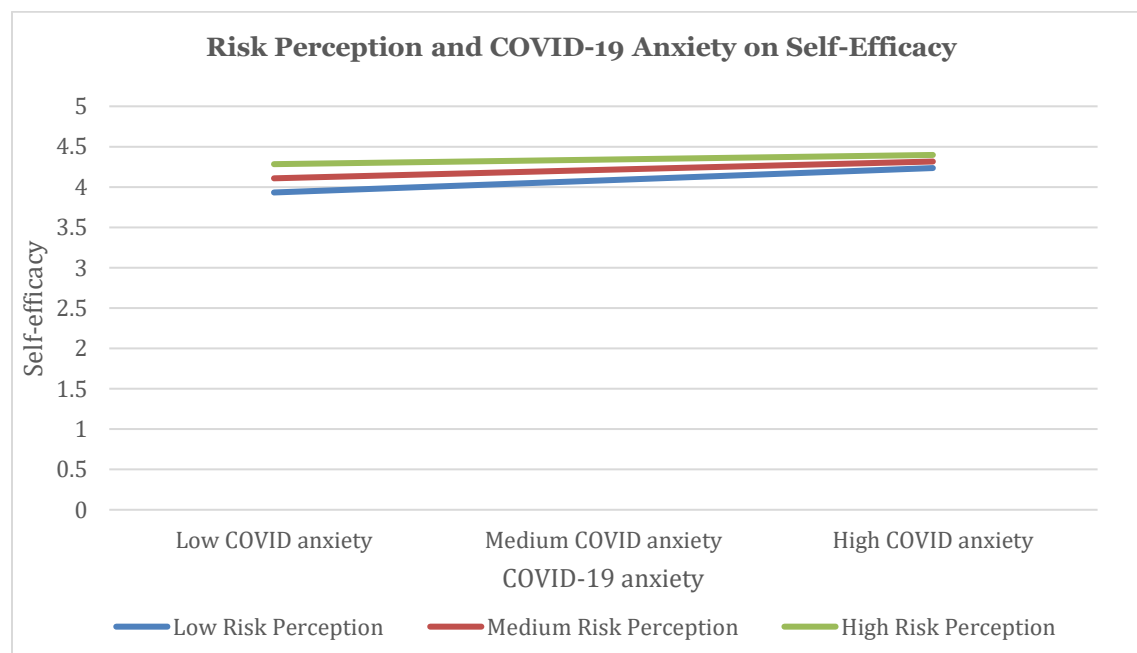
## Information Seeking

A moderated mediation was examined to determine whether information seeking was moderated by COVID-19 anxiety on SE, and if SE mediated the relation of a person's information seeking on behavioral intent. Because age, gender, and race were significantly associated with information seeking and behavioral intent through bivariate associations, they again were used as control variables within the model. In the equation examining whether COVID-19 anxiety moderated the effects of information seeking on SE, an omnibus effect was detected [$F(6, 930) = 27.11$, $p = .00$, $R^2 = .15$]. Information-seeking [$b = .09$, $t(930) = 10.01$, $p = .00$] and COVID-19 anxiety [$b = .08$, $t(930) = 4.46$, $p = .00$] uniquely contributed to the overall effect on SE. The interaction of information-seeking and COVID-19 anxiety [$b = -.01$, $t(930) = -1.11$, $p = .27$] did not uniquely contribute to the overall effect on SE. Examining the mediating role of SE on information seeking and behavioral intent, we found an overall significant effect [$F(5, 931) = 163.81$, $p = .00$, $R^2 = .47$]. Information seeking [$b = .08$, $t(931) = 9.41$, $p = .00$] and SE [$b = .61$, $t(931) = 20.57$, $p = .00$] both significantly contributed to behavioral intent.

# Discussion

The current study was conducted within a social-cognitive theoretical framework to better understand the confluence of motivating factors impacting one's SE to engage in effective social distancing during the rise of the COVID-19 pandemic. The results support the strong influence of SE on intention to social distance, which underscores the importance of identifying factors that influence one's SE. Both perception of risk (e.g., Cho & Lee, 2015; Schwarzer & Renner, 2000; van de Pligt, 1996) and information seeking (e.g., Bults et al., 2015; Farooq et al., 2020; Lin et al., 2014) were selected as known influences on SE and behavioral intentions, and the results indicate both direct and indirect influences of each on SE and behavioral intentions. Finally, the current study wanted to assess how the context of one's felt anxiety about COVID-19 altered the associations. COVID-19 anxiety dampened the influence of perceived risk on SE, but did not moderate the influence of information seeking on SE.

## The Mediating Role of Self-Efficacy as Moderated by COVID-19 Anxiety

A sizeable body of literature supports the role of SE in the uptake of health prevention behaviors (e.g., Lo et al., 2015; Maguire et al., 2019; Rimal; 2001), even in the context of a pandemic (Cho & Lee, 2015; Farooq et al., 2020; Smith et al., 2016; Yıldırım & Güler, 2020). From a social cognitive perspective (Bandura, 2001), however, other factors may influence behavioral intentions directly, as well as indirectly, by their influence on SE. In this investigation, risk perception and information seeking were included as such factors.

### Risk Perception

Risk perception is a complex variable, derived from environmental cues, such as new knowledge, fitted with personal experience, but also interacting with one's internal mindset in regards to vulnerability, worry, and fear. Risk perception in the current study was defined as hearing about COVID-19 related deaths. While risk perception was expected to positively relate to intention to social distance directly, the association between risk perception and SE was also added, given that vulnerability can influence how one views their abilities and negatively impact planning (Bandura, 2008). Risk perception related positively to intention to social distance. This supports the conclusion of other studies on risk perception and preventative health behaviors in the context of a pandemic (Abdelrahman, 2020; Cho & Lee, 2015) and may be a byproduct of the timing of data collection (Bults et al., 2015). Future research should examine this association to determine if it holds across different points of the pandemic, such as when perceived risk declines.

Risk perception also positively related to SE, such that hearing about more instances of COVID-19 deaths related to higher reported SE. It is important to acknowledge here the cross-sectional nature of the data as

causal links between the variables cannot be ascertained. It may be the case that individuals already high in SE were more proactive in seeking out this type of information as part of their planning or may be better at regulating such information through various strategies (e.g., psychologically distancing themselves from the cases they have heard about to buffer against threats to their own SE; Bandura, 1982; 2001).

This is where the moderating influence of COVID-19 anxiety becomes important. We hypothesized that the association between risk perception and SE in the model would be altered by COVID-19-related anxiety, and, indeed, this conclusion was supported. At each increasing level of COVID-19 anxiety, the positive association between risk perception and SE was lessened. The significant interaction suggests that COVID-19 anxiety can start to alter the impact that risk-related knowledge can have on SE. This finding in some ways reflects the broader conceptualization of risk perception (e.g., Cho & Lee, 2015) as a combination of perceived vulnerability (i.e., the anxiety) and perceived severity (i.e., risk associated with death). This work highlights the independent mechanisms through which these variables may associate with intention to protect oneself, with knowledge alone associated with intention to social distance as found in Cho and Lee (2015), but the interaction with COVID-19 anxiety dampening the association with SE (Bandura, 2008). It should be noted that while COVID-19 anxiety dampened the influence, risk perception was still positively associated with SE even at the highest level of COVID-19 anxiety.

**Information seeking**
Research has shown that information gathering during a pandemic coincided with greater likelihood to participate in preventative health behaviors (Farooq et al., 2020; Lin et al., 2014). Furthermore, information gathering holds a reciprocal relationship with SE, such that information gathering may bolster SE by creating a sense of commonality, providing social models, and supporting goal-setting and planning (Bandura, 1982, 2008). Therefore, we hypothesized that information seeking would relate directly to behavioral intention, but also indirectly through SE. These hypotheses were supported and underscored the importance of providing accurate, timely information to bolster both confidence and intention to perform preventative health actions during a pandemic.

The current study proposed that COVID-19-related anxiety might alter the relation between information seeking and SE given that engaging in information seeking can be maladaptive if it becomes obsessive or results in information overload (Farooq et al., 2020). The interaction between information seeking and COVID-19 anxiety was not significant. Information seeking, regardless of an individuals' COVID-19 anxiety level, was positively related to SE.

A key difference between the initial variables of risk perception and information seeking was intentionality. Active information seeking is intentional whereas risk perception, defined in this study as hearing of COVID-19 related deaths, may occur through intentional information search or unintended exposure to such news. Given that the core premise of SCT is that people have agency over how they experience the world through intentional behavior, reflection, and self-regulation (Bandura, 2001), it is somewhat unsurprising that the more intentional the interaction with the environment, the less likely it is to be affected by held anxieties. This is especially true given that information search may be used as a strategy to both cull COVID-19 anxiety as much as it is a strategy to set goals and plan for the future (Bandura 2008).

## Implications and Limitations

The current study was a rapid research response to capture a moment in a historically situated, quickly evolving pandemic. In capturing these early responses, the results emphasize the importance of supporting SE as a mechanism with a strong influence on prevention behavior intention; the associations observed with risk perception, information seeking, and COVID-19 anxiety suggest the takeaways of adequately describing risk, reducing pandemic-related anxiety, and providing accurate, transparent communication across different levels and modes. The findings are, however, limited in generalization as the data are specific to a time and

place, the beginning phases of the pandemic in the United States. More research, longitudinal if possible, would be necessary to examine how these relations may change with time (Bults et al., 2015). Generalization is also limited as the present sample was a convenience sample from an online crowd-sourcing website that may differ from the general population, although other research suggests its comparability (Follmer et al., 2017).

Due to the timing of data collection, valid measures specific to COVID-19 were not available. While the current study drew from published research grounded in theory (e.g., Gözüm & Aydin, 2004; Vernon et al., 1997) and work from other similar pandemic circumstances (e.g., Huang et al., 2011; Setbon & Raude, 2010) in the creation of items, these measures were not validated with independent samples. These measures, however, improve upon frequently employed single-item measures of these constructs.

Mediational models often require experimental or time-varying data to truly test cause and effect mechanisms. The vast body of literature on SCT and SE provides the rationale for the hypothesized mechanisms, although longitudinal data would provide a more compelling test of directionality. Furthermore, research (e.g., Durham et al., 2012) has suggested that these variables and their associations may change over the course of the pandemic, which again speaks to the need for ongoing longitudinal research.

## Conclusion

The current study provides a snapshot of the associations between risk perceptions, information-seeking behaviors, COVID-19 anxiety, and SE in an effort to better understand personal and contextual associations with intention to engage in preventative health behaviors during the current pandemic. Consistent with the role afforded to it in SCT frameworks, SE is strongly related to behavioral intentions. Therefore, efforts should continue to identify elements of the environment and individuals that influence SE. In these data, both risk perception and information seeking positively related to SE, with COVID-19 anxiety interacting with risk perception to reduce this association. More research is needed to clarify whether these patterns hold across time, but these findings could be impactful in shaping how information is presented or guide recommendations for how to reduce pandemic-related anxiety so that information about risk does not threaten one's belief in their ability to practice prevention behaviors.

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