In March 2020, the World Health Organization declared a pandemic caused by the novel SARS-CoV-2 virus (COVID-19) prompting a lockdown in the United States during which many Americans were required to stay home and refrain from unnecessary contact with others. The COVID-19 virus poses physical threats due to its contagious nature along with psychological threats due to its potential to provoke fear and distress (Courtney et al., 2020). Throughout the pandemic, a wide variety of responses have been witnessed among different groups of individuals. Given the breadth of responses to the pandemic that have been seen and the importance of understanding how psychological factors impact health behaviors, it is important to examine the factors that impact these responses and behaviors and how they vary in different groups.

Perhaps one of the most important factors to consider is individual risk perception. The threat of the COVID-19 pandemic and how certain demographic groups differ in their COVID-19 risk perceptions.
COVID-19 virus has led to the study of COVID-19 risk perception as its own variable. Olapegba et al. (2020) operationalized COVID-19 risk perception by examining individuals’ perceived risk of contracting COVID-19 along with how risky the individual perceived the virus to be. The main purpose of the current study was to explore relationships between health attitudes and individual differences with COVID-19 risk perception.

An individual’s attitude toward cautionary behaviors (e.g., wearing protective face masks, social distancing, vaccination) is arguably one of the most evident responses to the threat posed by the COVID-19 virus. Numerous studies have been conducted throughout the COVID-19 pandemic to explore factors that may impact one's attitudes toward these types of behaviors. The link between risk perception and behaviors that protect oneself from the risk of disease have often been studied with illnesses such as influenza, SARS, and Ebola (Bruine de Bruin & Bennett, 2020; Iorfa et al., 2020; Lu et al., 2021; Majid et al., 2020). In fact, Majid et al. (2020) found that in a meta-analysis of 149 studies, risk perception was the most prominent predictor of how individuals feel about and engage in cautionary behaviors. Denial of personal risk may lead to refusal to conform to health mandates such as mask wearing, social distancing (Sleigh & Nelson, 2020), or even getting a vaccination, as it may be perceived as unnecessary (Lacey & Rivera, 2022). In relation, COVID-19 vaccination intent has been shown to correlate with high levels of risk perception (Haneda et al., 2022). However, regardless of disparities in risk perception, those who perceive greater risk associated with COVID-19 are more likely to express willingness to engage in cautionary behaviors (Bruine de Bruin & Bennett, 2020).

In one study, Vieites et al. (2021) found that individuals who wore masks were more likely to believe they would not contract COVID-19 once they were made aware that mask wearing decreases risk of contracting the virus, however, these individuals were also more likely to take greater risks; this study demonstrates how complex the relationship between risk perception and attitudes toward cautionary behaviors may be. Furthermore, Alqahtani et al. (2021) called for further investigation into the relationship between COVID-19 risk perception and participation in cautionary behaviors due to the impact of cultural and societal factors. Upon reviewing evidence of this complex relationship, we decided to not only explore the relationship between COVID-19 risk perception and attitudes toward cautionary behaviors such as wearing a mask and getting vaccinated against COVID-19, but also to explore potential moderators in this relationship.

In addition to risk perception, health anxiety—anxiety characterized by being preoccupied with having or developing a serious illness and maintained by behaviors that alleviate distress while increasing or maintaining symptoms or feelings of anxiety (Haig-Ferguson et al., 2021)—may be an important factor in understanding individual responses to the pandemic. Taylor (2019) asserted that the anxiety surrounding COVID-19 would be an adaptive response to the threat of the virus, which may provide motivation for partaking in cautionary behaviors related to COVID-19. It is perhaps unsurprising then that those who had health anxiety prior to the pandemic are more at risk of considering COVID-19 a critical situation that may trigger health-related worries (Haig-Ferguson et al., 2021). For the purpose of this study, we focused on exploring how health anxiety relates to COVID-19 risk perceptions; however, we also suspect that health anxiety may have a relationship with attitudes toward cautionary behaviors based on previous findings.

Health attitudes appear to be related to COVID-19 risk perception, but individual differences likely play an important role in understanding COVID-19 risk perceptions as well. Interestingly, one’s worldview beliefs may facilitate or undermine their health behaviors (Pyszczynski et al., 2020). Worldview consists of value and belief orientations which have been suggested as factors that influence individual risk perceptions (Siegrist & Bearth, 2021). It has been found that when people are faced by threats to their well-being and livelihood—such as that posed by the COVID-19 virus—they often cope by behaving in ways which work to confirm and strengthen their worldview (Guan et al., 2020; Pyszczynski et al., 2020). Pyszczynski et al. (2020) explain that under the umbrella of worldview, political ideology plays a central role in how people respond to these threats to well-being and livelihood and often leads to greater differences in individuals with opposing worldviews. Thus, it is unsurprising that individual belief systems such as political beliefs have been found to impact responses to the COVID-19 pandemic (Iorfa et al., 2020; Sleigh & Nelson, 2020).

Considering that worldviews are important in understanding individual behaviors, it is necessary to explore how some aspects of individual worldview beliefs shaped responses to the COVID-19 pandemic. High politicization was a major factor influencing these responses in the United States as the increased involvement of politics in determining protective measures within the country may very well have influenced risk perceptions and attitudes (Bruine de Bruin et al., 2020). The highly politicized environment led to tensions between opposing political groups—particularly those identifying as Democrat or liberal and those identifying as Republican or conservative. Prior to the pandemic,
political beliefs were found to predict perception of scientific findings in that Republicans were more likely to express disbelief toward scientific studies than Democrats (Broomell & Kane, 2017). Thus, it may be unsurprising that Bruine de Bruin et al. (2020) found Democrats to have higher COVID-19 risk perception in addition to being more likely to express willingness to participate in cautionary behaviors than Republicans. Along these lines, studies have found that liberals have higher risk perceptions associated with COVID-19 (Pyszczynski et al., 2020; Wolaver & Doces, 2022). Additionally, one's political beliefs may impact their confidence in the decisions of their political leaders (Shao & Hao, 2020) as well as lead to differences in trust they have in the government (Chilanga et al., 2022), both of which have been found to impact COVID-19 risk perceptions. Together these findings lead us to explore how political beliefs work with COVID-19 risk perception in understanding behaviors.

Like political beliefs, education may be important in understanding COVID-19 risk perception given the role of trust in science. Plohl and Musil (2021) found that education was positively correlated with trust in science and trust in science was positively correlated with COVID-19 risk perception, although the authors called for further investigation given the weak association found between education level with perceived risk and compliance with COVID-19 prevention guidelines. Although other research has suggested that those who attended or completed postsecondary education were more likely to express willingness to engage in cautionary behaviors (Vally, 2020), there is a lack of research specifically examining education level and perceived COVID-19 risk. Given these ambiguous preliminary findings, we believed it to be important to include education in our exploration of COVID-19 risk perceptions.

Previous research has also indicated that gender is another major individual difference that may impact one's COVID-19 risk perceptions. Lu et al. (2021) found that being female was a significant predictor of higher risk perception compared to being male. Additionally, men and women have been shown to express different responses to high-risk situations, with women having higher risk responses compared to men (Finucane et al., 2000). Women have also been found to express more fear and worry in relation to COVID-19 (Prati et al., 2021). Because of this, we were interested in how gender differences might impact COVID-19 risk perceptions.

Differences in age may also play a role in how individuals engage in certain health behaviors and account, in part, for the wide variety of responses seen during the pandemic. Previous research suggests that health-promoting behaviors increase with age, though the relationship may be complicated (Bozo et al., 2009). For instance, Lu et al. (2021) found that older age predicted higher COVID-19 risk perception, and Bechard et al. (2021) found that middle-aged and older adults were more likely to express concern for health impacts of COVID-19 relative to young adults; however, it may be that individual and systemic factors impact health-related worries related to COVID-19 in younger populations, thus impacting their responses to the pandemic. Nonetheless, it seems that in general, older populations demonstrate more favorable attitudes toward cautionary behaviors due to greater risk for being negatively impacted by COVID-19 (Biro et al., 2021). Given these findings, we expected that age differences may also impact, and be related to, COVID-19 risk perceptions.

**Purpose**

The physical and psychological threats posed by the COVID-19 virus necessitate investigatory research to inform not only how individuals respond to COVID-19 and provide a framework for understanding the diverse set of reactions witnessed during the pandemic, but also to add to the body of research looking at how individual and psychological factors impact health-related behaviors in different groups. As such, the purpose of the present study was to explore the correlates of COVID-19 risk perceptions, the relationships of these risk perceptions with cautionary attitudes, examine how worldview beliefs—specifically liberalism—influence those relationships to gain a better understanding of the mechanisms behind COVID-19 reactions, and determine if certain groups of individuals differed in their COVID-19 risk perception. Specifically, the following research questions were investigated: (a) How is COVID-19 risk perception related to age, attitude toward mask wearing, attitude toward the COVID-19 vaccination, education, health anxiety, and liberalism?; (b) Does liberalism moderate the relationship between COVID-19 risk perception and attitudes toward masking and the COVID-19 vaccine?; and (c) Are there differences in COVID-19 risk perception when considering individual differences such as age, education, and gender identification?

**Method**

**Procedure and Participants**

After gaining approval from the Lorain County Community College Institutional Review Board, an electronic link to the self-report survey was distributed in two ways. First, we used a convenience sample approach and recruited introduction to psychology students at a midwestern community college who were given extra credit for their voluntary participation.
Recent previous research regarding electronic media use and the COVID-19 pandemic (Wright et al., in press) and health, well-being, and social media use (Wright et al., 2020) have demonstrated that the college student population is important to study. Second, in hopes of diversifying the demographics of our sample, participants were recruited for voluntary participation via Facebook and Reddit through a post that detailed the topic and purpose of the study as well as assurance of confidentiality and anonymity. No compensation was provided for participating in the study, regardless of the recruitment source. Participants signed an informed consent which disclosed the purpose of the survey and ensured appropriate handling of data. Upon completion, participants were provided with online resources for emotional help and information pertaining to the COVID-19 virus, including SAMHSA’s national helpline (U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, 2021), the World Health Organization’s COVID-19 pandemic informational website (World Health Organization, 2021), and the Centers for Disease Control and Prevention COVID-19 informational website (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2021). Data was collected in April 2021 from 243 participants; however, 32 of those participants were excluded for being under 18 years old.

The average age of the voluntarily recruited participants (N = 211) was 25.77 years (SD = 10.88) and ranged from 18 to 72 years. Most (85.80%) of the sample were introduction to psychology students and the rest (14.20%) were recruited via social media and may or may not have been college students. The sample was predominantly women (72.00%), with 23.70% identifying as men, 2.30% identifying as transgender or gender nonconforming, and 1.90% not identifying their gender. Most participants (79.10%) identified as White or European American, followed by Hispanic or Latino (6.60%), Asian or Asian American (3.80%), African American or Black (3.80%), and Biracial or Multiracial (3.30%). Regarding religious affiliation, 51.20% of the sample identified as Christian, 15.20% as Agnostic, 13.30% as unsure or undecided, 6.60% as Atheist, 2.80% as Muslim, 0.90% Buddhist, and the remainder reported some other religion or preferred not to answer. Regarding political identity, 37.40% of the participants identified as Democrat, 24.20% as Independent, 17.10% as Republican, 16.10% preferred not to answer, and 5.20% reported “other.” Of our sample, 49.30% reported at least some college as the highest level of education completed, 14.20% have completed an associate’s degree, 8.00% have completed their bachelor’s degree or some graduate level work, and some have completed a high school degree (18.50%) or are still in high school (3.80%). Most worked 25 hours or more per week (58.80%) or less than 25 hours per week (18.00%), and 18.00% of the sample was unemployed at the time of data collection. According to a post hoc power analysis using G*Power (Faul et al., 2007), our sample of 211 participants was sufficient to detect a small to medium effect for moderation with one predictor and one moderator.

Measures

Attitudes Toward Cautionary Behaviors

We were interested in the participants’ attitudes toward certain cautionary behaviors, specifically wearing a mask and getting the COVID-19 vaccine and assessed this using two self-reported items. First, using a 5-point scale from 1 (very comfortable) to 5 (not at all comfortable) we asked participants, “When the mask mandate is lifted, how comfortable will you feel not wearing a mask?” Second, using a 5-point scale from 1 (definitely will not get the vaccine) to 5 (definitely will get the vaccine/I have already received the COVID-19 vaccine) we asked participants, “When the vaccine that will help to prevent against COVID-19 becomes available to you, will you get the vaccine?” Each of these questions were used independently with high scores reflecting a more preventative attitude toward COVID-19 cautionary behaviors.

COVID-19 Risk Perception

An individual’s perception of perceived COVID-19 threat was measured using Olapegba et al’s (2020) 9-item COVID-19-Related Risk Perception scale. Using a 7-point scale from 1 (not at all worried) to 7 (extremely worried), participants responded to questions such as, “How worried are you about contracting the Coronavirus?” Research has demonstrated acceptable reliability (α = .76) of the measure (Olapegba et al., 2020) and the coefficient alpha reliability in our sample was .84. High scores indicate a higher perception of risk for COVID-19.

Health Anxiety

An individual’s health anxiety was assessed using the 14-item Health Anxiety Inventory (Salkovskis et al., 2002). Participants were provided 4 statements and selected the one with which they most agreed. An example of four statements within an item is, “I do not worry about my health,” “I occasionally worry about my health,” “I spend much of my time worrying about my health,” and “I spend most of my time worrying about my health,” scored as 0, 1, 2, and 3, respectively. The 14-items were summed to create one health anxiety score for each participant. Salkovskis et al. (2002) reported a
coefficient alpha reliability of .95 and criterion validity of the measure. For our sample we found a coefficient alpha reliability of .85. High scores reflect more health-related anxiety.

Political Beliefs
Political beliefs were measured using the 6-item Liberal subscale of the Political Belief Scale (Webber et al., 2018) to assess the extent of an individual’s liberal stance on various political topics. Participants used a 7-point scale from 1 (strongly disagree) to 7 (strongly agree) to items such as, “There should be a ban on the sale of all firearms.” Research has demonstrated acceptable reliability (a = .72) of this subscale (Webber et al., 2018). We found a coefficient alpha reliability of .77, with higher scores indicating more liberal political beliefs.

Results
Descriptive statistics and coefficient alphas (see Table 1) and intercorrelations among all study variables (see Table 2) are provided. All variables have reasonable means and variability, and all coefficient alphas were within an acceptable value of .70 or higher (Nunnally, 1978). Notably, our sample reports a relatively low average health anxiety score, which is not surprising considering the average age of our sample is 25.77 years. Correlational analysis was used to explore the relationships between COVID-19 risk perception and age, attitude toward masking, attitude toward the COVID-19 vaccination, education, health anxiety, and liberalism. Results found that COVID-19 risk perception had significant positive correlations with attitude toward masking, \( r(209) = .40, p < .001 \), attitude toward the COVID-19 vaccination, \( r(209) = .27, p < .001 \), education, \( r(209) = .21, p = .003 \), health anxiety, \( r(209) = .37, p < .001 \), and liberalism, \( r(209) = .36, p < .001 \), demonstrating moderate effect sizes (Cohen, 1992). COVID-19 risk perception was not significantly correlated with age.

Hierarchical linear regression analysis was conducted to explore whether liberalism was a moderator to further understand the relationship between COVID-19 risk perceptions and cautionary attitudes. The data showed that liberal political beliefs moderated the relationship between COVID-19 risk perceptions and attitude toward masking, \( \Delta R^2 = .02, F(1,207) = 5.66, p = .02, f^2 = .02 \) (see Figure 1). Liberalism also moderated the relationship between COVID-19 risk perceptions and attitude toward getting the COVID-19 vaccine, \( \Delta R^2 = .02, F(1,207) = 5.14, p = .02, f^2 = .02 \) (see Figure 2). These moderators show a small effect size (Cohen, 1992).

Further, we wanted to explore potential individual differences in COVID-19 risk perceptions, specifically if these risk perceptions differed by age, education, and gender. Using independent-groups t tests, we found that COVID-19 risk perceptions significantly differ by age, \( t(209) = -1.74, p = .04, d = 0.24 \), showing participants 21 years and older (\( M = 4.24, SD = 1.11 \)) had significantly higher average COVID-19 risk perception than those under 21 years old (\( M = 3.98, SD = 1.06 \)). COVID-19 risk perceptions also significantly differ by gender identity, \( t(209) = -3.08, p < .001, d = 0.50 \), showing females (\( M = 4.28, SD = 1.04 \)) had significantly higher average COVID-19 risk perception than males (\( M = 3.74, SD = 1.15 \)). COVID-19 risk perceptions did not differ by education. These significant findings each indicate a small to medium effect size, respectively (Cohen, 1992).

Discussion
Statistical analysis in relation to the first research question indicated that education and health anxiety were significantly positively correlated with COVID-19 risk perception, a finding that expands the literature regarding our understanding of what impacts an individual’s assessment of perceived risk. Participants who were more educated or had greater health anxiety were more likely to perceive COVID-19 as a risk. Finding that education significantly related to COVID-19 risk addresses Plohl and Musil’s (2021) call for further investigation into the role of education in COVID-19

### TABLE 1

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Coefficient alpha</th>
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<td>1.00</td>
<td>5.00</td>
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<td>1.00–5.00</td>
<td>1.00</td>
<td>5.00</td>
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<tr>
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<td>1.00–7.00</td>
<td>1.00</td>
<td>7.00</td>
<td>.84</td>
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<tr>
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<td>0.00–42.00</td>
<td>1.00</td>
<td>33.00</td>
<td>.85</td>
</tr>
<tr>
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<td>1.00–7.00</td>
<td>1.00</td>
<td>6.67</td>
<td>.77</td>
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### TABLE 2

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<th>4</th>
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<td>.27</td>
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<tr>
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<td>.15</td>
<td>.21</td>
<td></td>
<td></td>
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<tr>
<td>Health Anxiety</td>
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<td>.22</td>
<td>.11</td>
<td>.37</td>
<td>.13</td>
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<td>.47</td>
<td>.34</td>
<td>.36</td>
<td>.10</td>
<td>.18</td>
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</tbody>
</table>

Note: \( p < .05 \), \( *p < .01 \).
risk perception and advances our understanding that more educated individuals tend to perceive greater risk. This may relate back to their findings that education was positively correlated with trust in science (Plohl & Musil, 2021) and informs how, moving forward, education is an important individual difference variable for understanding why some individuals perceive risk in a health crisis and why others do not. Furthermore, our results indicate that the more health anxiety a person has, the more likely they are to perceive COVID-19 as a risk, which aligns with Haig-Ferguson et al.'s (2021) finding that those who had health anxiety prior to the pandemic were at more risk of seeing COVID-19 as a serious situation, triggering health worries. Knowing that health anxiety matters can help health care professionals understand how to discuss crises such as the pandemic and potentially alleviate unnecessary anxiety to allow focus on important health-related actions that can keep people safe and healthy.

Alqahtani et al. (2021) called for further investigation into the relationship between COVID-19 risk perception and participation in cautionary behaviors, and although we focused on a person's attitude toward cautionary behaviors, we found that COVID-19 risk perception was significantly positively correlated with both attitude towards masking and vaccination, specifically that greater perceived COVID-19 risk led to increased beliefs related to masking and getting the COVID-19 vaccine. These findings align with previous research wherein those who reported higher COVID-19 risk perceptions were more willing to engage in cautionary behaviors (Bruine de Bruin & Bennett, 2020; Haneda et al., 2022) and denial of risk may lead to not adhering to health mandates such as masking (Sleigh & Nelson, 2020) and vaccination (Lacey & Rivera, 2022). It appears that risk perception is an important factor that impacts how individuals feel about engaging in cautionary behaviors and something that needs to be considered as we continue to deal with COVID-19 illness and consequences as well as inform future medical crises. Ensuring people understand the proper amount of risk during a health crisis can help increase willingness to follow health mandates such as masking and vaccination.

Continuing our exploration of individual differences regarding perceived risk of COVID-19, our results that indicate individuals who are more liberal in their political views were more likely to perceive higher COVID-19 risk supports much previous research regarding the impact of individual belief systems on responses to the pandemic (Iorfa et al., 2020; Sleigh & Nelson, 2020). As discussed previously, there was a highly politicized environment in the United States.
during the COVID-19 pandemic that may have influenced risk perceptions and attitudes, specifically that Democrats (Bruine de Bruin et al., 2020) and liberals (Pyszczynski et al., 2020; Wolaver & Doces, 2022) had higher COVID-19 risk perceptions. Worldviews, such as political alignment, are an important consideration when learning about why some individuals perceive more risk than others, particularly when a health crisis becomes politicized.

Beyond understanding the correlates of COVID-19 risk perceptions, we aimed to learn more about how these perceptions might influence pandemic-related cautionary attitudes such as masking and vaccines through our second research question. Our analysis found that political beliefs, specifically liberalism, moderated the relationship between COVID-19 risk perception and cautionary attitudes, both attitude toward masking and attitude toward getting the COVID-19 vaccine. Participants who scored higher in liberalism engaged in more cautionary attitudes than those low in liberalism (regardless of COVID-19 risk perceptions); however, when low in liberalism, those with high COVID-19 risk perceptions were more cautious in their attitudes than those with low COVID-19 risk perceptions (see Figure 1). These findings are consistent with previous research wherein Democrats and Liberals expressed more perceived risk associated with COVID-19 (Bruine de Bruin et al., 2020; Pyszczynski et al., 2020) and were more likely to believe in and engage in cautionary behaviors such as mask wearing and social distancing (Bruine de Bruin et al., 2020). These differences may be due to the political views of each party in that Democratic (or liberal) ideology tends to favor a focus on community responsibility and belief in scientific studies (Broomell & Kane, 2017) and lower liberalism is related to higher confidence in political leaders (Shao & Hao, 2020) which may be more influential than one’s risk perceptions. As such, differences in liberalism matter and seem to work with perceptions of COVID-19 risk when a person is deciding their willingness to engage in cautionary behaviors such as masking and vaccination.

In regard to individual differences in COVID-19 risk perceptions, we explored gender, age, and education differences. Statistical analysis related to gender showed that females had significantly higher COVID-19 risk perceptions than males. This finding aligns with the results of several studies focused on gender differences and risk perceptions, particularly that being female was a significant predictor of higher COVID-19 risk perception (Lu et al., 2021) and that females express more fear and worry in relation to COVID-19 (Prati et al., 2021). We also found that COVID-19 risk perception differed by age, but not by education level. Age seems to be part of one’s identity that can be directly impacted by COVID-19 because of immune system concerns. At the time of our data collection, the media was consistently broadcasting the case and death count due to COVID-19, and many medical professionals were articulating who was at most risk of serious illness or death, including older adults. Therefore, it seems understandable that older people’s perceived risk of contracting COVID-19 could be significantly different compared to younger people. Previous research has shown similar findings regarding the importance of age in COVID-19 risk perception (Bechard et al. 2021; Lu et al., 2021). On the contrary, level of education was not prevalently discussed in the media as being a primary risk factor of contracting severe illness due to COVID-19, thus not showing a difference in risk perception. Furthermore, if one goal during a health crisis is to encourage people to take cautionary actions, we know older populations have more favorable attitudes toward cautionary behaviors due to greater risk for being negatively impacted by COVID-19 (Biro et al., 2021), so keeping individual differences in mind, such as age and gender in regard to perceptions of risk, might help.

Limitations and Suggestions for Future Research

As with all research, this study is not without limitations. Given the ever-changing nature of the COVID-19 pandemic, results may reflect the time frame in which data was collected and therefore may not be congruent with results from data collected at another time during the pandemic. Thus, it is important to keep in mind that our data was collected in April 2021 when the COVID-19 vaccine was becoming more widely available and cautionary guidelines were becoming more relaxed. Many people stopped social distancing, wearing masks, and began viewing COVID-19 as less risky than at the height of the shutdown. This was prior to the emergence of COVID-19 variants, which began to be addressed in the United States in July 2021 by the CDC, who encouraged similar practices exhibited during pandemic lockdown conditions (Centers for Disease Control and Prevention, 2021).

Regarding limitations due to sample homogeneity, 71.60% of our participants were female, 79.30% identified as White, and the median age was 21 years old. Additionally, our statistical analysis indicated that health anxiety resulted in a relatively low mean score, possibly due to the age of our sample. Perhaps our results for the first research question in relation to COVID-19 risk perception and health anxiety would have been even stronger if our sample had a greater age range. Our study
has limited external validity and should be interpreted primarily with respect to college aged individuals. This is an important population to understand in a health crisis like COVID-19 even if younger people perceive less risk; in general, they may not be as greatly affected by COVID-19 but could bring the illness to someone in their life with a compromised immune system or advanced age. Understanding what drives younger college students’ COVID-19 risk perceptions and why they may or may not be willing to adhere to cautionary practices is therefore very important. Still, it would be interesting to replicate the present study with a more diverse sample to determine how age, gender identity, education level, and other relevant individual differences may impact our understanding of COVID-19 risk perceptions and attitudes toward cautionary behaviors. Future research can use a more targeted approach to recruiting individuals of specific ages and potentially varied educational levels.

Additional limitations concern specific measures employed in our study. In the time since we collected data, additional COVID-19 risk perception measures have been developed and validated (e.g., Capone et al., 2021), offering more ways for future research to garner an individual’s perceived risk. We used single-item measures of attitude with masking and attitude with getting the COVID-19 vaccination, and future research may want to investigate willingness to engage in these cautionary behaviors with more robust measures. Furthermore, the self-report nature of the survey poses limitations regarding the accuracy of potentially sensitive questions; however, we make the assumption that participants understand their own perceptions and can report without bias or social desirability.

Further research might focus on a deeper understanding of how worldview impacts individual responses. For example, a recent study found those identifying with an individualistic worldview were less likely to follow COVID-19 restrictions than those with a collectivist worldview (Siegrist & Bearth, 2021) and another found that a reason for differences in risk perceptions seen in more liberal individuals may be due to having a communal orientation (Wolaver & Doces, 2022). It has also been found that the media may play a significant role in influencing one’s views relating to the pandemic, as misinformation is highly prevalent due to politicization which may misconstrue the risk posed by COVID-19 (Anderson & Sivakumar, 2021). Additional research may benefit from examining individuals’ preferred source of news and media, which is likely influenced by worldview and may provide insight as to the role of media in influencing risk perceptions and willingness to engage in cautionary behaviors.

Finally, now that we are learning more about what impacts COVID-19 risk perceptions, future research can continue to focus on these perceptions as well as attitudes toward and use of cautionary behaviors and the role of perceived risk and other individual difference variables. For example, females have been found to express more fear and worry in relation to COVID-19 and therefore are more likely to believe in cautionary behaviors (Prati et al., 2021; Rana et al., 2021), whereas research by Howard (2021) revealed that males are more likely to view mask wearing as a violation of their independence and freedom, suggesting that they are less likely to believe in cautionary behaviors. Together with our findings, these studies indicate that gender differences related to health decisions may go beyond differences in risk perception. As we continue to move through the impact of the COVID-19 virus, we need to understand perceptions of illness risk and how to encourage cautionary behaviors when they promote health benefits. This, in turn, can inform future health crises.

**Implications**

The present study demonstrates important contributions to health psychology research regarding the COVID-19 pandemic. Specifically, our findings that education and health anxiety were positive correlates of COVID-19 risk perception advances the literature regarding what factors impact perceived risk of illness. Our results showing positive correlations between liberalism, attitude toward masking, and attitude toward the COVID-19 vaccination with perceived COVID-19 risk complement and expand the literature as well. Age and gender differences in perceived COVID-19 risk further help in understanding why some individuals perceive COVID-19 as more of a threat than others.

The importance of worldview on attitudes such as mask wearing and seeking vaccination is another major takeaway of this study. We found that liberalism worked with COVID-19 risk perceptions to influence willing attitudes toward cautionary behaviors during the pandemic. This may be due to the increased participation in activities that strengthen one’s worldview when confronted by threats that raise awareness of one’s own mortality, such as the threat posed by the COVID-19 virus (Courtney et al., 2020; Goldenberg & Arndt, 2008). Knowledge of factors that impact perceptions and attitudes toward cautionary behaviors may be useful in messaging about and guidelines for not only COVID-19, but potentially for future health crises as well.

Lastly, this research stresses the importance of time and context for research relating to unforeseen crises such as a global health pandemic. Given the rapid evolution of the pandemic, context during each phase of
cultural worldview buffer mortality salience effects on responses to self-management health model for behavioral health promotion. https://doi.org/10.1080/713670162
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Data files for this study have been registered at https://osf.io/cfky9/. The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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