Research Article

The effects of agentic and communal traits and conspiracy beliefs on covid-19 beliefs and behaviors

Abstract

The COVID-19 pandemic and its aftermath that have swept across the world from 2020 through the present has provided an abundance of often conflicting ideas about how to protect the self and others, including issues related to misinformation and conspiracy theories. This study soughtto investigate how belief in conspiracy theories interacted with the personality traits of agency, communion, unmitigated agency (UA), and unmitigated communion (UC) to predict the extent to which participants felt that COVID-19 presented a real threat to society and the extent to which mitigation efforts such as masking and social distancing could help stop the spread of the disease. Participants ($n = 105$) were recruited via social media posts and represented a diverse sample in terms of age, ethnicity, and gender. Results generally indicate that conspiracy beliefs are associated with not believing that COVID-19 poses a threat to well-being and that mitigationefforts are not efficacious, however higher levels of agency and communion are protective against these beliefs whereas higher levels of UA exacerbate them. UC was not significant in these analyses. Implication will be discussed.

Keywords: Covid-19, behaviour, individuals, neuroticism

Alexander Nagurney, Elizabeth Sauceda, Laura Mendoza
Department of Psychology, University of Hawaii at Hilo, USA

Correspondence: Alexander Nagurney, Department of Psychology, University of Hawaii at Hilo, USA, Email nagurne@hawaii.edu

Introduction

The Effects of Agentic and Communal Traits and Conspiracy Beliefs on COVID-19 Beliefs and Behaviors COVID-19 (short for "coronavirus disease of 2019"), a highly contagious SARS (sudden acute respiratory syndrome) variant, swept the globe beginning in early 2020, and to date has been responsible for almost seven million deaths worldwide.[1] COVID-19 is a genetically superior virus in that it can be passed on days before symptoms emerge, and it only kills its host in approximately one out of every one hundred cases, allowing for maximum opportunity to spread from a current host to a new host;[2] World Health Organization, 2023). Due to the high risk of contagion and the rate at which COVID-19 spread during 2020, governments worldwide set out guidelines to help their citizens stay safe and reduce the spread of COVID-19. COVID-19 is presently transitioning from a pandemic to endemic, and some people are still practicing related safety precautions. Common guidelines include wearing masks in public, maintaining a minimum 6ft distance between oneself and others, testing for COVID-19 before and/or after travel, sanitizing hands before entering and after leaving public spaces, and more. Some people have been more willing than others to adhere to COVID-19 safety protocols. While many factors contribute to people's willingness to adhere, the current study looks at the role played by one's beliefs in conspiracy theories surrounding COVID-19 as well as the role played by the personality traits of agency, communion, unmitigated agency, and unmitigated communion. Adherence to COVID-19 safety protocol behaviors and personal beliefs about both the utility of these behaviors and the threat ofCOVID-19 are examined.

Conspiracy theories and impacts of beliefs and behaviors

The relationship between conspiracy theories, belief, and action has generally been distilled down to exposure to the conspiracy theory, followed by belief, which results in behavior.[3] In other words, repeated exposure to an idea can potentially cause an individual to begin believing this idea to be true, even in the absence of supporting evidence. Once someone begins to believe an idea, it should follow that their behavior will fall in line withtheir belief. This progression, however, is rarely straightforward. Douglas report beliefs are often social, tied to understanding and feeling safe in one's environment. Research exploring the consequences of conspiracy belief, however, is sparse. An unanswered question remains: To whom, and under what conditions, if any, do conspiracy theories satisfy psychological motivations? Conspiracy theories can help reinforce our preexisting beliefs.[4,5] During the COVID-19 pandemic, those who maintained an anti- vaccine or anti-masking stance were more likely to avoid cognitive dissonance by maintaining conspiracy theory beliefs to counter disconfirmatory evidence. Commonly, people turned to their social networks to find and associate with others who had similar beliefs.

Arshad et al.,[6] found a significant correlation between belief in COVID-19 conspiracy theories and unwillingness to get vaccinated. Participants who believed in COVID-19 conspiracy theories were less likely to accept vaccination. Belief in a COVID-19 conspiracy theory was also linked to a greater likelihood of believing in other conspiracy theories, which made that conspiracy belief a risk factor for not believing COVID-19 is a real threat. Conspiracy theories thrive in a vacuum of information, resulting from the need for cognitive closure.[4,7] During the beginning of the COVID-19 pandemic, there was a lack of consistent and scientifically verifiable information guiding safety behaviors such as social distancing and masking. In the absence of such information, research suggests the need for cognitive closure likely motivated people toward conspiracy belief. Additionally, research has suggested distress resulting from uncertainty further entrenches conspiracy beliefs.[4,8] Feelings of ostracism, which can result from social isolation, can also lead to conspiracy belief, the underlying motivator being the need to understand the experience.[9] Conspiracy belief is weakly correlated with the lack of prevention measures during the COVID-19 pandemic.[10]

Bierwiaczoneket al.,[10] conducted a meta-analysis in which it was found that conspiracy beliefs were associated with reluctance to adhere to social distancing mandates and lowered vaccination rates, however these beliefs were unrelated to mask wearing behaviors or hygiene

responses such as hand washing. While some associations between conspiracy belief and beliefs and behaviors surrounding COVID-19 are evident, Uscinski et al.,[3] noted evidence remains unclear as to how conspiracy beliefs motivate behavior, and these motivations need to be addressed. One possible link between conspiracy beliefs and the beliefs and behaviors surrounding COVID-19 could be personality traits like agency, communion and their unmitigated counterparts. These traits are discussed in the following section.

Agentic/communal traits and interpersonal and health-related outcomes

Agency and communion represent fundamental modalities of human behavior.[11] Agency refers to focus on the self while communion refers to focus on connection with others. Each modality serves to mitigate the other, eliciting a positive balance between the two in most individuals. Though balanced in many individuals, some people demonstrate a proclivity toward one modality over the other. In these cases, the individual's proclivity toward one modality goes unchecked, or unmitigated, by the other, leading these individuals to possess higher levels of unmitigated agency (UA - agency with the relative absence of communion) or unmitigated communion (UC - communion with the relative absence of agency).[12] As described in the following paragraphs, agency and communion are generally associated with healthy outcomes, while their unmitigated counterparts are more predictive of decreased well-being.

A study by Korlat et al.,[13] found that three adjectives were best used to measure agency: courageous, sporty, and strong. Ghaed et al.,[14] found that agency was correlated with dominance, and agentic individuals were found to have characteristics such as being independent, assertive, well adjusted, and embedded in a social network. Another study by Helgeson et al.,[15] reported agency was associated with higher levels of extraversion and conscientiousness and a lower level of neuroticism. This pattern of agency being associated with healthy emotional adjustment and self-esteem has been supported by multiple studies.[16–18] Korelat et al.,[13] also reported three attributes were best used to measure communion: emotional, sympathetic, and empathetic. In this study, communion was predictive of socially responsible behavior. Similar to agency, Ghaed et al.,[14] found communion had positive implications for social functioning and was positively associated with friendliness. Helgeson et al.,[15] found that, while communion is typically unrelated to self-relevant outcomes such as self-esteem and depression, it is consistently related to positive relationship outcomes. Taken together, these findings suggest communion, like agency, is associated with a host of outcomes that are indicative of healthy functioning, particularly when others are involved.

With an unhealthy focus on the self, unmitigated agency fosters antisocial behaviors such as hostility, arrogance, greed, and cynicism.[18] People who have high levels of UA tend to have a negative view of the world and others. Unmitigated agency has also been correlated with poor self-esteem and poor health behaviors. These individuals' antagonistic attitudes toward the world and others create interpersonal problems, and they are often perceived as vindictive, cold, and domineering. Individuals high in UA tend toward neuroticism and a lack of conscientiousness and agreeableness.[14,15] Ghaed et al.,[14] also found UA individuals tend to be more physically and verbally aggressive, use anger in destructive ways, experience more social conflict, and do not perceive themselves as belonging to a social group. They tend to show poor emotional adjustment, evident via elevated levels of depression and anxiety. Ghaed et al.,[14] suggest a cycle of poor social interactions leading to a lack of social support for the individual, which, in turn, leads to even more low quality social interactions. Taken together, these findings suggest UA, unlike its mitigated counterpart of agency, is a risk factor for a host of poor health-related and interpersonal outcomes, largely due to the focus solely on the self to the exclusion of others. Like unmitigated agency, unmitigated communion is also associated with poor relationships and social interactions, worse health outcomes, and lower levels of overall well- being.[18] While UC is positively associated with providing support to others, individuals high in UC do not always perceive support as being available to them. This perception can lead to depression and negative interactions with others. Those high in UC possess two primary interpersonal problems: overinvolvement with others (i.e., intrusiveness) and neglect of the self (i.e., exploitable due to non-assertiveness). Individuals high in UC often possess a poor self-image and low self-esteem, which largely account for their higher levels of depression.[16]

The "other focus" in UC implies these individuals are externally, rather than internally, focused and rely on validation and self-esteem from others. Helgeson et al.,[16] theorized overinvolvement and caretaking of others may be attempts to enhance others' views of the self, thereby increasing a sense of self-worth. Individuals who are high in UC also struggle with vulnerability in relationships. They are unlikely to self- disclose, have difficulty asserting themselves, and feel uncomfortable accepting support from others. In Ghaed and Gallo's study, UC was associated with friendly and submissive traits which corresponded with excessive nurturance. Individuals with higher UC reported higher levels of emotional distress, hostile cognition, and anger rumination. High levels of UC have also been found to positively correlate with health deficits.[15] Individuals high in UC adjust poorly to health concerns, increasing the difficulty of caring for themselves and the distress they experience while ill and after illness abates. This correlation has been found in cases of coronary heart disease and adolescents with diabetes.[19,20] On the whole, these findings suggest UC, unlike its mitigated counterpart, is a risk factor for negative health-related and interpersonal outcomes, largely due to an excessive focus on the needs of others to the exclusion of caring for one's own needs.

Hypotheses

This body of research sought to discover what part, if any, the personality variables of agency, communion, and their unmitigated counterparts played in predicting behaviors and beliefs during the COVID-19 Pandemic. Because of agency and communion's association with healthy outcomes related to the well-being of the self and the well-being of others, respectively, it was predicted they would be associated with healthy beliefs and behaviors (e.g., believing COVID-19 poses a real health threat, masking indoors or in groups, and washing or sanitizing hands). Due to unhealthy associations with outcomes related to well-being, UA and UC were predicted to be associated with unhealthy beliefs and behaviors (e.g., believing COVID-19 does not pose a real health threat, not masking indoors or in groups, and not washing or sanitizing hands). It was further hypothesized that belief in conspiracy theories, because of their inherent distrustful nature, would be associated with the same unhealthy beliefs and behaviors as UA and UC. Agency and communion were expected to serve as moderators of the relationship between belief in COVID-19 conspiracy theories and the various beliefs and behaviors assessed in the study. Specifically, being high in either agency or communion was expected to negate the otherwise negative effects of conspiracy beliefs, whereas a lack of either agency or communion was expected to allow these negative effects to reveal

themselves. Finally, it was predicted that UA and UC would also serve as moderators of the relationship between belief in COVID-19 conspiracy theories and the various beliefs and behaviors assessed in this study. Specifically, being high in either UA or UC was predicted to exacerbate the already negative effects of conspiracy beliefs, whereas a lack of either UA or UC was predicted to allow these negative effects to be less evident.

Method

Participants and procedure

Participants were recruited widely through emails, social media posts, and classes in the small psychology program at the University of Hawai'i at Hilo. Minor compensation was offered in the form of extra credit for student participants ($n = 35)$. No compensation was offered to non-student participants ($n = 70$). Participants were not informed of the hypotheses of the study. The participants' ($n = 105$) ages spanned from 19 years old to 75. The mean age was 40.26 with a standard deviation of 15.02. Of the participants, 73% identified as female ($n = 77$), 21% as male ($n = 22$), 4% as non-binary ($n = 4$), 1% as transgender ($n = 1$), and 1% as intersex ($n = 1$). In the category of race, White participants accounted for 81% ($n = 85$) of respondents, 3% were Black ($n = 3$), 12% were Asian ($n = 13$), and Native Hawaiian or Pacific Islanders made up 4% ($n = 4$). Also included is the category of Hapa (mixed identity of Asian, Hawaiian, White, and/or American Indian) which 12% of respondents qualified for ($n = 13$), and Biracial White and Black which represented 4% of respondents ($n = 4$). In terms of ethnicity, most of our participants identified as non-Hispanic or Latiné at 90% ($n = 95$), with 10% of those surveyed identifying as Hispanic and Latiné ($n = 10$). Potential participants were sent a link to the survey via class announcements, email, and social media posts. Participants were also asked to share the link with interested others in order to increase the diversity of the sample. All responses were voluntarily and anonymously collected using Google Forms. Participants did not receive any monetary compensation for their participation, and they were instructed that they could choose to skip any questions they did not feel comfortable answering and that they could terminate their participation at any point in the survey. Data was analyzed using the Statistical Package for Social Sciences (SPSS, version 29).

Instruments

The survey was created using Google Forms and included several sections: COVID-19 beliefs and behaviors, the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, and Stapp 1973), the Revised Unmitigated Communion Scale (RUCS;[16]), and demographics. The COVID-19 beliefs section included questions taken from two previous studies (Arshad et al., 2021; Cseizler et al., 2020) as well as additional questions composed by the researchers. The COVID-19 behaviors section was composed by the researchers based on COVID-related literature, news articles, internet threads, conversations, and personal experiences. The demographic section included recording of age, gender, race, and ethnic background.

COVID-19 beliefs

A full list of the questions posed to participants regarding their beliefs about COVID-19 can be found in **Appendix A**. All items were rated on a scale from 1 (strongly disagree) to 5 (strongly agree) with the midpoint of 3 being neutral. A principal components factor analysis utilizing a promax rotation resulted in three factors with eigenvalues greater than 1. An examination of the resulting pattern matrix demonstrated the presence of one factor corresponding to belief in

the effectiveness of mitigation efforts, a second factor corresponding to the belief that COVID-19 presents a real threat to well-being, and a third factor corresponding to the belief in COVID-related conspiracy theories (Figure 1).
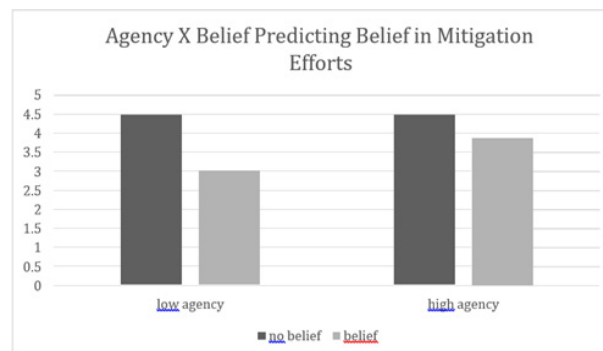

Figure 1 Agency X belief predicting belief in mitigation efforts.

Belief in mitigation effort: The belief in mitigation efforts factor was composed of 9 items that were averaged together to form a composite score. Example items include "Social distancing a minimum of 6 feet can help prevent or reduce the spread of COVID-19," "Wearing a mask in public can help prevent or reduce the spread of COVID-19," and "Limiting the group size of gatherings can help prevent or reduce the spread of COVID-19." Cronbach's alpha was .93, demonstrating excellent internal consistency (Figure 2).
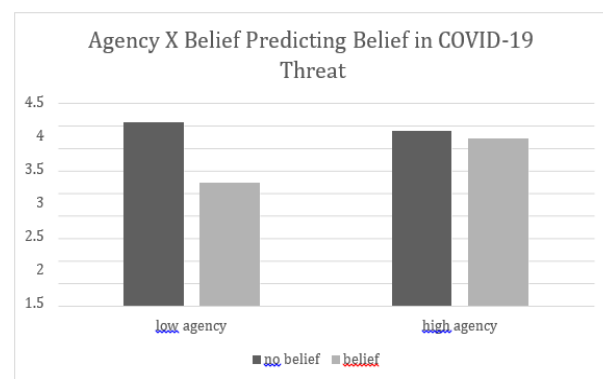

Figure 2 Agency X belief predicting belief in covid-19 threat.

Belief in threat: The belief in threat factor was composed of 9 items that were averaged together to form a composite score. Example items include "I am or have been afraid of getting extremely ill with COVID-19," "I am or have been worried that being around other people could potentially expose me to COVID-19," and "I am or have been worried that getting extremely ill with COVID-19 would put significant emotional, financial, time-related, and/or occupational strain on my family, friends, roommates, and/or coworkers. "Cronbach's alpha was 90, demonstrating excellent internal consistency (Figure 3).

Belief in conspiracy theory: One's belief in conspiracy theory was assessed using two items that were averaged together to form a composite score: "The COVID-19 vaccines contain 5G Nano-chips to control people," and "COVID-19 and its vaccines have been created to control the world population." These items were highly correlated, r (105) = .81, $p < .001$. It should be noted that there were several other items that also loaded on this factor (e.g. "COVID-19 vaccines have safety issues that could kill people"), however researchers chose to focus on only these two items because they are theoretically distinct from the others in the sense that only these two prompts focus on efforts to *deliberately* harm or control others whereas the rest of the

items are more focused on harmful outcomes that are less intentional (or still being researched in somecases) (Figure 4 & 5).
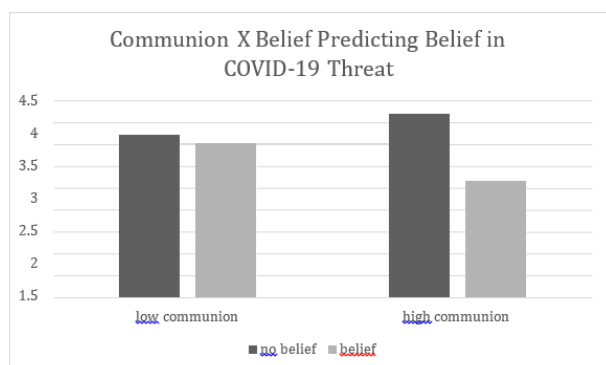

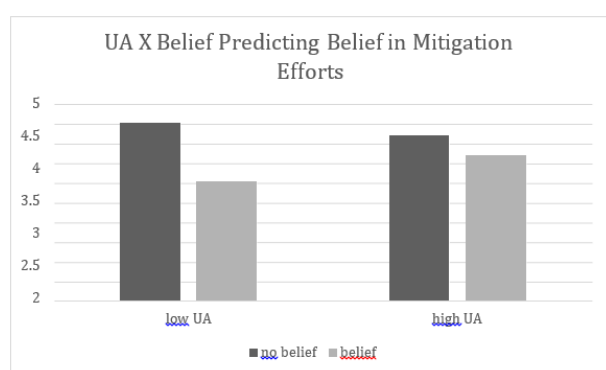**Figure 3** Communion X belief predicting belief in covid-19 threat.

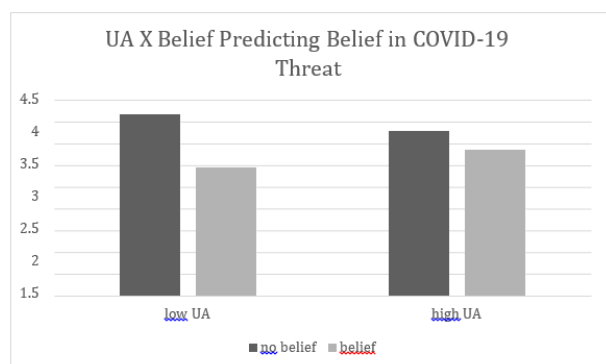**Figure 4** UA X belief predicting belief in mitigation efforts.

Figure 5 UA X belief predicting belief in covid-19 threat.

COVID-19 behaviors

A full list of the questions posed to participants regarding their COVID-related behaviors can be found in **Appendix A**. All items were rated on a scale from 1 (never or almost never) to 5 (always or almost always) with the midpoint of 3 being half the time. A principal components factor analysis utilizing a promax rotation resulted in three factors with eigenvalues greater than 1. An examination of the resulting pattern matrix demonstrated thepresence of one factor corresponding to testing, a second factor corresponding to following CDC(Centers for Disease Control and Prevention) guidelines, and a third factor corresponding to masking.

Testing behaviour: Testing behavior was assessed using six items that were averaged together to form a composite score. Example items are "I have taken or would take a COVID-19 test if I had/ have any potentially COVID-19-related symptoms," and "I wait

a minimum of threedays after potential exposure before testing for COVID-19." Cronbach's alpha was .85, demonstrating excellent internal consistency.

CDC guideline-related behaviour: Behaviors related to following CDC guidelines were assessed using five items that were averaged together to form a composite score. Example itemsare "Throughout the pandemic, I have read and attempted to follow guidelines laid out by the CDC, peer-reviewed scientific and medical journals, and similar official entities," and "I have followed guidelines around limiting the number of people in group gatherings." Cronbach's alpha was .83, demonstrating strong internal consistency.

Masking behaviour: Masking behaviors were assessed using three items that were averaged together to form a composite score. Example items are "I wear or have worn a mask indoors in public," and "I make a point of finding out if anyone I will be spending time with unmasked is immunocompromised and/or at higher risk of contracting COVID-19." Cronbach's alpha was .66, demonstrating acceptable internal consistency.

Handwashing behaviour: While not specifically delineated by the factor analysis, two further questions were included asking about how often participants sanitized their hands beforeentering and after leaving a public space. These items were highly correlated, r (105) = .72, p <.001, and were averaged to form the handwashing factor.

Personal Attributes Questionnaire: The PAQ is a commonly-used and well-validated scale for assessing the traits of agency, communion, and unmitigated agency. Each scale is composed of eight items that were averaged to form a composite. Cronbach's alpha were .72 for agency, .73 for communion, and .57 for unmitigated agency. These represent acceptablereliabilities, though unmitigated agency is admittedly lower than ideal.

Revised Unmitigated Communion Scale: The RUCS is another commonly-used and well-validated scale. It assesses unmitigated communion using nine items that are averaged to form a composite score. In the current study Cronbach's alpha was .79, indicating strong internalconsistency.

Demographics: Participants were asked to provide their age (in years), gender (optionswere female, male, non-binary, or other), race (options were White, Black/African American, American Indian/ Alaska Native, Asian, Native Hawaiian/other Pacific Islander - select all thatapply), and ethnicity (Hispanic/Latiné or not).

Results

Personality and outcomes

In order to test the various relationships between the traits of agency, communion, UA, and UC and the beliefs (mitigation, threat) and behaviors (testing, guidelines, masking, handwashing) assessed in this study, a series of partial correlations were computed. Because agency, communion, UA, and UC are inter-correlated, partial regressions were computed to test the relationships between the various personality traits and each of the beliefs and behaviors. The relationships between each trait and the corresponding beliefs and behaviors were computed while controlling for each of the other three traits. Agency and masking behavior were positivelycorrelated, r (100) = .22, p = .026, whereas all other correlations with agency as well as those involving communion, UA, and UC were non-significant. This pattern suggests that the various hypotheses concerning the relationships between these personality traits and COVID-19 beliefs and behaviors were not supported.

Conspiracy beliefs and outcomes

Participants were separated into two groups, the "no conspiracy belief" group ($n = 85$) and the "conspiracy belief" group ($n = 20$). The "no conspiracy" group rated both of the following items as 1 ("strongly disagree") on a 5-point scale: "The COVID-19 vaccines contain 5G Nano-chips to control people," and "COVID-19 and its vaccines have been created to control the world population." If a participant rated either or both of these items a 2 ("somewhat disagree") or higher on the 5-point scale then they were considered to at least have entertained the idea that a conspiracy was involved with COVID-19 and were therefore placed in the "belief" group.

A series of *t*-tests were computed to test for differences between these groups on the main study variables (i.e., personality traits, beliefs, and behaviors). The "no belief" group ($M = 4.20, SD = .45$) was higher than the "belief" group ($M = 3.93, SD = .54$) for communion, $t(103) = 2.36, p = .020$, but no differences emerged for agency, UA, or UC. In terms of beliefs and behaviors, the "no belief" group was higher than the "belief" group for all variables with the exception of handwashing - in this case the "belief" group was higher than the "no belief" group. In other words, those individuals who give some credence to conspiracy theories generally see mitigation efforts as less effective and are less likely to take part in such efforts (handwashing excluded). See Table 1 for a summary of the means and standard deviations for each of these variables separated by group.

Table 1 Means and standard deviations of major study outcomes

	No conspiracy belief (n = 85)	Conspiracy belief (n = 20)
Belief in the efficacy of mitigation efforts	4.37 (.74)	3.46 (.97)
Belief that COVID-19 poses a threat	3.98 (.82)	3.21 (1.11)
Testing behavior	4.33 (.64)	3.66 (1.07)
Guideline-related behavior	4.13 (.72)	3.45 (1.07)
Masking	4.17 (.82)	3.65 (.97)
Handwashing	3.66 (1.20)	4.35 (.83)

Personality by conspiracy beliefs and outcomes

A series of regression analyses were performed to test whether the "belief" and "no belief" groups were operating differently beyond the mean differences presented above. Each regression involved a trait (centered to reduce multicollinearity) and group membership (dummy coded) entered on step one with the interaction between each trait and group membership entered on step two. The various belief and behavior variables served as the dependent variables. For simplicity, only the belief outcomes (belief that COVID-19 poses a real threat and belief that mitigation efforts are efficacious) will be discussed since none of the behavior outcomes (testing, guidelines, masking, handwashing) reached statistical significance.

Agency by belief in conspiracy effects: The interaction between agency and belief group was significant for both belief in mitigation, *beta* = .66, $p = .016$, and belief in threat, *beta* = .77, $p = .007$. See Figures 1 and 2 for graphical depictions of these interactions. In order to probe these effects further, the simple effects were analyzed separately by level of agency. A median split was used to separate those relatively high in agency from those who were relatively low.

For the mitigation variable, when analyzing the low agency group independently, it was found that the non-belief group ($M = 4.34, SD =$ .80) was statistically higher than the belief group ($M = 3.06, SD = .77$), $F(1, 50) = 20.95, p < .001$. When analyzing the high agency group, it was also found that the non-belief group ($M = 4.40, SD = .69$) was more likely to believe that mitigation efforts could be successful than the belief group ($M = 3.87, SD = 1.01$), $F(1, 51) = 4.11, p = .048$, however this difference was more striking for the low agency group than the high agency group.

For the belief in threat variable, when analyzing the low agency group independently, it was found that the no belief group ($M = 4.08, SD = .78$) was statistically higher than the belief group ($M = 2.72, SD = 1.01$), $F(1, 50) = 22.05, p < .001$. When analyzing the high agency group however, it was found that no belief group ($M = 3.88, SD = .85$) was not statistically different from the belief group ($M = 3.71, SD = 1.02$), $F(1, 51) = .28, p = .597$.

Taken together, these results suggest that those who don't believe in conspiracy theories generally perceive that mitigation efforts are useful and that COVID-19 does represent a meaningful threat to one's well-being. The results also highlight the fact that higher levels of agency provide a buffer against the risk factor of believing in conspiracy theories when it comes to these beliefs in mitigation efforts and threat level.

Communion by belief in conspiracy effects: The interaction between communion and belief group was significant for belief in threat, *beta* = -.73, $p = .014$, but not belief in mitigation, *beta* = -.43, $p = .135$. See Figure 3 a graphical depiction of this significant interaction. A median split was again used to separate those relatively high in communion from those who were relatively low and the effects were analyzed separately based on level of communion. When analyzing the low communion group independently, it was found that the non-belief group ($M = 3.70, SD = .85$) was not significantly different than the belief group ($M = 3.51, SD = 1.05$), $F(1, 48) = .40, p = .532$. When analyzing the high communion group however, the no belief group ($M = 4.19, SD = .72$) was significantly higher than the belief group ($M = 2.67, SD = 1.11$), $F(1, 53) = 24.00, p < .001$.

This pattern indicates that a lack of belief in conspiracy theories coupled with a high level of communion is predictive of the strongest belief that COVID-19 represents a real threat to well-being, whereas any level of belief in conspiracy theories erases this benefit of communion.

UA by belief in conspiracy effects: The interaction between UA and the belief group was significant for both belief in mitigation, *beta* = .64, $p = .037$, and belief in threat, *beta* = .63, $p = .046$. See Figures 4 and 5 for graphical depictions of these interactions. These effects were again analyzed separately by level of UA with a median split being used to separate those relatively high in UA from those who were relatively low. For the mitigation variable, when analyzing the low UA group independently, it was found that the no belief group ($M = 4.53, SD = .50$) was significantly higher than the belief group ($M = 3.03, SD = .82$), $F(1, 48) = 44.42, p < .001$. When analyzing the high UA group however, it was found that the no belief group ($M = 4.21, SD = .90$) was only marginally significantly higher than the belief group ($M = 3.69, SD = 1.00$), $F(1, 53) = 3.07, p = .085$.

For the belief in threat variable, when analyzing the low UA group independently, it was found that the no belief group ($M = 4.17, SD = .71$) was significantly higher than the belief group ($M = 2.95, SD = 1.01$), $F(1, 48) = 15.65, p < .001$. When analyzing the high UA group however, it was found that the no belief group ($M = 3.78, SD = .88$) was not different from the belief group ($M = 3.36, SD = 1.17$), $F(1, 53) = 1.96, p = .167$.

Taken together, these results again suggest that those who don't believe in conspiracy theories generally perceive that mitigation efforts are useful and that COVID-19 does represent a meaningful threat to one's well-being, however the results also highlight the fact that higher levels of UA seem to erode some of the protective effects of not believing in conspiracy-related theories.

UC by belief in conspiracy effects: The interaction between UC and the belief group was not significant for either belief in mitigation, *beta* = -.12, *p* = .706, or belief in threat, *beta* = .03, *p* = .936.

Discussion

It was hypothesized that agency and communion would be associated with healthy outcomes whereas UA and UC would be associated with unhealthy outcomes. These hypotheses were largely unsupported. There was a single significant correlation between agency and masking, indicating that higher levels of agency were associated with more mask wearing. This pattern indicates that any direct relationships between these personality traits and beliefs or behaviors surrounding COVID-19 are weak at best. The findings regarding conspiracy beliefs are much stronger and more consistent than the personality effects. Those participants who demonstrated some level of belief in conspiracy- related ideas were less likely than those who lacked such beliefs to test for COVID-19, wear masks, follow CDC guidelines, believe that COVID-19 poses a real threat to well-being, or believe that mitigation efforts to stop the spread of the disease are efficacious. The one outcome for which believing in conspiracy-related ideas seemed beneficial was handwashing. While these results do highlight the importance of taking potential beliefs in conspiracy- related ideas into account, their interactive effects with the personality traits of agency, communion, UA, and UC provided some of the most interesting and instructive findings in the current study. If one thinks of conspiracy beliefs as a risk factor for not taking mitigation efforts and health risks seriously, then the personality traits of agency, communion, UA, and UC could be thought of as potential moderators that either shield against or magnify the negative effects of conspiracy beliefs. There is evidence of these moderation effects in this study, though not necessarily always in the pattern one might expect.

High levels of agency were protective against conspiracy beliefs in the sense that when levels of agency were relatively low and there was some belief in conspiracy, the beliefs that mitigation efforts are effective and that that COVID-19 poses a real threat to health were both at their lowest points - this effect was negated when levels of agency were relatively high. This supports the idea that high levels of agency serve as a buffer against the otherwise negative effects of conspiracy beliefs. Somewhat surprisingly, high levels of communion seemed to be less protective against the negative effects of conspiracy beliefs and were unrelated to beliefs in mitigation efforts. In fact, when examining perceived threat, communion actually seems to have a polarizing effect. Threat levels were highest when there was no belief in conspiracy coupled with high levels of communion, however threat was lowest when there was some belief in conspiracy coupled with high levels of communion. This distinction between conspiracy belief versus non-belief did not appear for the low communion individuals. One potential explanation is that because high communion individuals value their relationships more than low communion individuals, they could potentially be more influenced by their social network in an effort to get along with others more efficiently. If one is high in communion and also has network members who believe in conspiracy, this would result in a blunted belief that COVID-19 poses a threat. If their network lacks such beliefs in conspiracy theories, then high communion individuals would see COVID- related threat as significantly more real, thus accounting for the pattern demonstrated by the current findings.

When examining the findings related to UA, the pattern is the same for beliefs in mitigation efforts and perceived threat. When UA was low, a lack of belief in conspiracy theories was associated with higher threat and higher belief in mitigation efforts than having a belief in conspiracy theories. This difference was erased for both outcomes when levels of UA were high. This pattern indicates that the relative absence of UA, a trait that represents an unhealthy focus on the self, is actually protective for individuals who don't believe in conspiracy theories in the sense that they believe mitigation efforts should be effective and that COVID-19 poses a real threat to health. On the other hand, any belief in conspiracy-related ideas when coupled with low levels of UA is associated with a decreased belief in both the efficacy of mitigation efforts and perceived threat of COVID-19. This pattern of results for UA is the opposite of that described above for communion. This makes sense given that UA is often defined as an unhealthy focus on the self with a relative lack of communion, though any results involving UA should be interpreted cautiously given its lower than ideal reliability. Notably, UC did not interact with conspiracy beliefs to predict either belief in mitigation efforts or perceived threat of COVID-19. One potential reason for this lack of findings could be related to the ways that individuals who are high in UC relate to others. Because of their extreme focus on others, their belief systems could be more heavily influenced by their social networks than individuals who don't possess this trait. If social networks include people who both do and do not believe in conspiracy theories, then one might expect to see a diluting effect in which some individuals who are high in UC are pulled in one direction while others are pulled in another direction, thus resulting in a zero-sum outcome like is seen here. One might expect that the findings related to beliefs in threats to health and efficacy of mitigation efforts presented above should translate into behaviors that are reflective of these beliefs, however this was not the case in the current study.

While the moderation effects, taken as a whole, do a good job of predicting beliefs, they do not predict any of the tangible behaviors assessed here such as wearing a mask or following CDC guidelines for social distancing. This might seem like a significant discrepancy at first glance, however there is a fairly significant extant literature suggesting that people do not always act in accord with their beliefs. For example, the cognitive dissonance literature would suggest that individuals will often take part in behaviors that go against their personal beliefs in the face of pressure from others. In the case of COVID-19, there has been (and there continues to be) a lot of resistance to taking part in the measures addressed in this study such as masking and social distancing. It's likely that many of the participants did believe that these measures would be effective, but larger external social pressures from friends and the media stopped these participants from following through with the behaviors corresponding to their beliefs.

The current study does have a number of limitations that should be addressed by future research. One major limitation is that location was not assessed in this investigation. Given that participants were recruited widely, those who were in different locations might lean toward different political beliefs or affiliations (e.g. a given state might be very conservative or very liberal). This could account for a significant proportion of the variance in variables such as health behaviors and conspiracy beliefs. Future studies should be sure to collect information related to location so that this possibility can be assessed or at least accounted for. Another potential weakness is the

way in which the conspiracy belief versus no conspiracy belief groups were created. This distinction was based upon a "non-zero" response to one of two questions rather than a more continuous measure of the extent to which one believes in conspiracy. As a result, the groups are perhaps a bit more polarized than would be ideal. Whileimportant patterns have been identified using this approach, this polarization may have had the effect of making group differences appear larger than they actually are. Future studies should seek to have a more comprehensive way of examining belief in conspiracy theories. A third weakness is that much of this study was retrospective in that participants wereasked to recall the extent to which they took part in specific behaviors during the COVID-19 pandemic. It is widely known that memories are often not reliable sources of information regarding past experiences, so some of the outcomes in this study were likely skewed. It is nonetheless believed that the patterns described here are still meaningful because this skew would have happened across all participants regardless of their standing on the various personality traits and level of conspiracy belief.

Finally, it could be argued that the internal consistency for the UA variable was lower than ideal in this study, however a number of significant and predicted findings involving UA nonetheless emerged in the moderation analyses. It is thus believed that this is not a significantlimiting factor in the current investigation. While a number of limitations have been identified, the current investigation does have anumber of strengths associated with it. First, the sample is diverse in terms of age, gender identification, and racial group. This diversity suggests that the results can be applied in a fairly broad manner rather than limiting the generalizability to a single group such as college students or those under the age of 25. It is also believed that this investigation examines a combination of variables that has notbeen previously assessed and has demonstrated that this combination produces meaningful results that make theoretical sense. These results, particularly those related to COVID-19 beliefs,can be used as a basis to develop interventions for behavior change when individuals are faced with choices to take part in self-protective or other-protective behaviors. While the current study was not able to reliably predict behaviors, future research can build upon this new knowledge bydeveloping newer behavioral scale-based measures or observational measures that can be used tobetter assess behaviors of interest.

Conclusion

In closing, the current study has expanded the extant literature concerning the personality traits of agency, communion, UA, and UC by identifying the moderational roles played by thesetraits when examining the effect of conspiracy beliefs on various beliefs and behaviors related toCOVID-19. While this new knowledge represents a step forward, future research should continue to examine the ways in which these findings can be used to improve quality of life and well-being when faced with personal health-related beliefs and behavioral choices.

Acknowledgments

Conflicts of interest

The authors declare that there is no conflict of interest.

Funding

References

1. World Health Organization. *WHO Coronavirus (COVID-19) Dashboard.* 2023.

2. Geoghegan JL, Senior AM, Giallonardo F, et al. Virological factors that increase the transmissibility of emerging human viruses. *Proc Natl Acad Sci U S A*. 2016;113(15):4170–4175.

3. Uscinski J, Enders AM, Klofstad C, et al. Cause and effect: On the antecedents and consequences of conspiracy theory beliefs. *Curr Opin Psychol*. 2022;47:101364.

4. Douglas KM, Sutton RM, Cichocka A. The psychology of conspiracy theories. *Curr Dir Psychol Sci*. 2017;26(6):538–542.

5. Lewandowsky S, Gignac GE, Oberauer K. The role of conspiracist ideation and worldviews in predicting rejection of science. *PLOS ONE*. 2013;10(8):e0134773.

6. Arshad MS, Hussain I, Mahmood T, et al. A national survey to assess the covid-19 vaccine-related conspiracy beliefs, acceptability, preference, and willingness to pay among the general population of pakistan. *Vaccines(Basel).* 2021;9(7):720.

7. Marchlewska M, Cichocka A, Kossowska M. Addicted to answers: Need for cognitive closure and the endorsement of conspiracy beliefs. *European Journal of SocialPsychology.* 2018;48(2):109–117.

8. Van Prooijen J, Jostmann NB. Belief in conspiracy theories: The influence of uncertainty and perceived morality. *Eur J Soc Psychol.* 2013;43(1):109–115.

9. Graeupner D, Coman A. The dark side of meaning-making: How social exclusion leads to superstitious thinking. *Journal of Experimental Social Psychology*. 2017;69:218–222.

10. Bierwiaczonek K, Gundersen AB, Kunst JR. The role of conspiracy beliefs forCOVID-19 health responses: A meta-analysis. *Curr Opin Psychol.* 2022;46:101346.

11. Bakan D. *The duality of human existence.* Chicago: Rand McNally. 1966.

12. Fritz HL, Helgeson VS. Distinctions of unmitigated communion from communion: Self-neglect and overinvolvement with others. *Journal of Personality and Social Psychology.* 1998;75(1):121–140.

13. Korlat S, Holzer J, Reiter J, et al. The role of the big two in socially responsible behavior during the COVID-19 pandemic: Agency and communion in adolescents' personal norm and behavioral adherence to instituted measures. *PLOS ONE*. 2022;17(6):e0269018.

14. Ghaed SG, Gallo LC. Distinctions among agency, communion, and unmitigated agency and communion according to the interpersonal circumplex, five-factor model, andsocial-emotional correlates. *Journal of Personality Assessment*. 2006;86(1):77–88.

15. Helgeson VS, Fritz HL. The implications of unmitigated agency and unmitigated communion for domains of problem behavior. *J Pers*. 2001;68(6):1031–1057.

16. Helgeson VS, Fritz HL. A theory of unmitigated communion. *Personality and Social Psychology Review.* 1998;2(3):173–183.

17. Helgeson VS. Relation of agency and communion to well-being: Evidence and potential explanations. *Psychological Bulletin*. 1994;116(3):412–428.

18. Helgeson VS, Fritz HL. Unmitigated agency and unmitigated communion: distinctions from agency and communion. *Journal of Research in Personality.* 1999;33(2):131–158.

19. Helgeson VS. Implications of agency and communion for patient and spouse adjustment to a first coronary event. *Journal of Personality and Social Psychology*. 1993;64(5):807–816.

20. Helgeson VS, Escobar O, Siminerio L, et al. Unmitigated communion andhealth among adolescents with and without diabetes: the mediating role of eating disturbances. *Pers Soc Psychol Bull*. 2007;33(4):519–536.