



# You before me: How vertical collectivism and feelings of threat predicted more socially desirable behaviour during COVID-19 pandemic

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## Abstract

The present study investigated the relationship between outward orientation and COVID-related prosocial behavior, including adherence to containment measures, caring for others and providing support, limiting one's social life and responsible purchasing behavior. A sample of 500 Slovaks (250 women) aged between 18 and 86 ( $M = 44.32$ ,  $SD = 15.66$ ) participated in the study and responded to questions concerning their sociodemographic and personality characteristics, collectivism and individualism, the consciousness of future consequences and emotional responses to the pandemic. The results show that apart from the perceived threat of COVID-19, vertical collectivism is among the strongest antecedents of COVID-related prosocial behavior. Specifically, feelings of threat, vertical collectivism, conscientiousness, agreeableness, liberalism, and education predicted more prosocial behavior during the pandemic. Consequently, the study indicates that while excessive fear may have adverse effects on individuals' well-being, appealing to and cultivating collectivistic sentiments could contribute not only to containing the pandemic but also to making others' lives more bearable while it lasts.

**Keywords** Collectivism · Future orientation · Threat · Helplessness · Big five · COVID-19

## Introduction

A year and a half into the COVID-19 pandemic many scholars have examined the question of why people in many countries risk their health by refusing to follow prevention regulations. Several culprits have been proposed, including low trust in government and conspiracy theories (Earnshaw et al., 2020; Karić & Međedović, 2021; Martela et al., 2021). To pinpoint individual differences that predestine people to disobedience, personality factors – as generally related to health-promoting and compliant behavior – have also been investigated (Blagov, 2021; Zajenkowski et al., 2020). However, containing the pandemic can be also framed as a problem of public goods (Cato et al., 2020). People may be well aware that adherence to stringent measures is beneficial for

society only if a considerable majority of individuals comply yet still rely on others to make the sacrifices. In other words, they may be prone to reap the benefits from free-riding, since public goods are, by definition, non-rivalrous and non-excludable. The extant literature points out the importance of communicating how measures protect the most vulnerable individuals in order to make the prosocial aspect of adherence salient, thus encouraging more compliance (Blagov, 2021; Campos-Mercade et al., 2021). Therefore, we examined whether people's personality, collectivism and future orientation, or rather emotional factors, such as helplessness and feelings of threat, would predict how prosocially they behave with regard to the COVID-19 pandemic. To obtain a fuller picture of prosocial behavior during the pandemic, the present study expands the catalogue of COVID-related prosocial behaviors beyond mere adherence to containment measures. Instead, it also includes a set of voluntarily adopted behaviors that, though restricting one's freedom, could contribute to the others' well-being, such as caring for others, providing emotional support, limiting excessive purchases when some goods are scarce or restraining one's social life.

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## Adherence to Containment Measures as a Prosocial, Outwardly Oriented Behavior

Adherence to containment measures protects both the individuals who adhere and those in their vicinity. However, it may come at a certain – either monetary or psychological – cost to an individual and, thus, is referred to as a prosocial and selfless act (Dinić & Bodroža, 2021). Therefore, adherence could be related to an individual's outward orientation (i.e., the tendency to go beyond narrowly understood present-oriented self-interest). Past studies have found preliminary support for outward orientation being related to greater adherence to containment measures.

For instance, a relation was found between country-level collectivism and adherence to COVID-19 containment measures. Specifically, in more individualistic cultures people tend to comply with containment measures less (Chen et al., 2021). Concurrently, analysis of data from 98 countries showed that country-level collectivism was related to a lower number of COVID-19 cases and fatalities (Webster et al., 2021). Finally, English-speaking individualists (mostly from the U.S., the U.K., Canada and Australia) tended to show more disregard for experts' recommendations and support towards individuals who disobey the recommendations compared to those scoring high in collectivism (O'Shea & Ueda, 2021). Drawing on Hofstede's approach, Sivasdas et al. (2008) developed a four-dimensional typology with two bipolar subscales applicable at the individual level. Apart from Individualism-Collectivism, the authors pointed to the importance of the Vertical-Horizontal continuum. The resulting typology distinguishes two forms of collectivism: vertical (VC) and horizontal (HC). Generally, collectivists tend to see themselves as submerged in a group they belong to, but they differ in their preference for hierarchy between groups. While horizontal collectivists express egalitarian views about different groups, vertical collectivists tend to believe in some form of inter-group rivalry. Thus, based on the findings, we could expect collectivists to perceive adhering to containment measures as their contribution to the public good. If so, collectivism would explain adherence independently of fear of COVID-19. In other words, we could expect those who have stronger collectivistic sentiments – even if they are not particularly afraid of the disease – to be more willing to behave prosocially during the pandemic, including adhering to containment measures (H1). Following Sivasdas et al. (2008), we also explored the importance of the Vertical-Horizontal dimensions for prosocial tendencies. According to Hofstede's typology, Slovakia scores 52 (out of 100) in the Individualism-Collectivism dimensions, indicating no clear preference for either of the values. Since culture is embedded in individuals (Cho et al.,

2013), Slovakia provides an opportunity to investigate individual-level collectivism and individualism without an excessive country-level impact.

Another element of outward orientation is future orientation. Joiremen et al. (2012) specified that consideration of future consequences is related to a series of health-promoting behaviors, including exercising and healthy eating. According to Strathman et al. (1994), greater future orientation may be related to a heightened perception of potential future losses and regret caused by decisions made in the present or, instead, by negligence. In the context of the COVID-19 pandemic, Lalot et al. (2021) found that future orientation was positively related to adherence to containment measures. Specifically, apart from suffering less pandemic-related distress, more future-conscious individuals not only expressed greater adherence to containment measures but also had a greater sense of compassion and got involved in collective actions, such as donating money to a cause or volunteering more often. Consequently, we could expect more future-oriented individuals to show greater involvement in prosocial behaviors during the pandemic (H2).

## Emotional Response to the Pandemic

The beginning of the pandemic was marked by inflated feelings of threat and anxiety (APA, 2020; Ballová Mikušková & Verešová, 2020; Cypriyańska & Nezlek, 2020; MNFORCE et al., 2020; Salari et al., 2020). Unsurprisingly, perhaps, both the perceived risk of contracting the disease and the threat posed by COVID-19 predicted the adoption of preventative health behaviors (Bruine de Bruin & Bennett, 2020; Dryhurst et al., 2020). Specifically, Imbriano et al. (2021) examined how the perceived risk of contracting the disease together with its perceived cost (understood broadly as economic, social, physical and emotional consequences of the infection) correlate with adherence to recommended health behaviors. The authors found that adherence increased with perceived grave consequences of being infected rather than with the risk of contracting the disease. In addition to greater adherence to containment measures, a stronger emotional response to the pandemic was also associated with more prosociality. For instance, across 56 countries, Jin et al. (2021) found that both the perceived negative consequences of contracting the disease and the effects of the pandemic on daily life were positively related to prosocial behavior during the pandemic. Also, a linguistic analysis of messages from Sina Weibo (a Chinese communicator) in the early phase of the pandemic indicated that those using more fear-related words in communication were also more prone to mention prosocial behaviors (Ye et al., 2020). Similarly, Serrano-Montilla et al. (2021) observed that those reporting greater perceived health-related – but not financial – threats expressed more prosocial tendencies.

On the other hand, the relationship between helplessness and preventive behavior is less straightforward. The pandemic and its uncontrollable nature could worsen some symptoms of learned helplessness (i.e. the inability to adaptively respond to threats, thus leading to passive response to threatening situations, including the failure to adhere to preventive measures). For example, Morgul et al. (2021) found that helplessness was related to the failure to adhere to preventive measures. Similarly, feelings of helplessness were negatively related to fear of being infected during the pandemic (but not before) in a study in Brazil (Lifshin & Mikulincer, 2021). Thus, we also expected that heightened feelings of threat, but not helplessness, would be associated with more prosocial behaviors during the pandemic (**H3**).

### Demographics and Personality

Demographics and personality are believed to predict a series of health-related behaviors via how people seek help, respond to illness, adhere to treatment and adopt behaviors that promote or hamper their health (Bogg & Roberts, 2004; Ingledew & Brunning, 1999; Jerram & Coleman, 1999). In the context of the COVID-19 pandemic, higher Conscientiousness and Agreeableness – and in some research also Extraversion and Openness – and lower Neuroticism proved to be related to health-promoting behavior (see Aschwanden et al., 2021; Bogg & Milad, 2020; Carvalho et al., 2020; Lazarevic et al., 2020; Ludeke et al., 2021). The relationships between Conscientiousness, Agreeableness and Neuroticism and health-promoting behaviors was also repeatedly revealed in pre-pandemic research (Bogg & Roberts, 2004; DeYoung, 2006; Hoffmann & Risse, 2020; Strickhouser et al., 2017; Tucker et al., 2006).

However, during the pandemic, the effect of personality characteristics on adherence to containment measures was modest (Zajenkowski et al., 2020). Accordingly, in Slovakia, too, during the first and second wave of the pandemic the effect of personality traits (Extraversion, Agreeableness, Conscientiousness) on adherence to curfew regulations, wearing masks and social distancing measures was low (Čavojská et al., 2022; Kohút et al., 2021). Nevertheless, we could expect those higher in Conscientiousness and Agreeableness and lower in Neuroticism to show greater involvement in prosocial behaviors during the pandemic (**H4**).

Blagov (2021) examined how different public health messages appealed to people depending on their personality (self-centered, responsible, compassionate, avoidant, sociable) and how likely these messages were to affect their behavior. He found that adaptive traits (Agreeableness, Conscientiousness) predicted the appeal of compassionate and responsible public health messages (“Help protect the vulnerable!” “Take personal responsibility!”), and maladaptive traits predicted their non-appeal. Participants in this

study preferred compassionate messages over self-centered ones (“Keep yourself healthy!”), which also corroborates the results of other pre-pandemic studies that found that an appeal to altruism increases compliance with health measures (Betsch et al., 2013; Grant & Hofmann, 2011). However, Blagov (2021) warns that such messages may backfire in antagonistic individuals. It could be expected that higher Agreeableness and Conscientiousness will be associated with more prosocial and future-oriented behavior (**H5**).

In terms of demographics, women tend to engage more in health-promoting behavior (Čavojská et al., 2022; Clark et al., 2020; Dawson et al., 2007; Kowalik & Lewandowski, 2021; Rehman et al., 2018). Next, higher education, being less religious and having a liberal political outlook were related directly to health-protective measures and regulations, as well as indirectly through questionable beliefs to higher adherence (or less avoidance) (Bronstein et al., 2018; Čavojská & Ersoy, 2019; Čavojská et al., 2022; Lobato et al., 2020; Teovanović et al., 2020; Van Prooijen, 2017). Finally, older people seem to be more prone to adhere to health regulations and to avoid less hygiene and social distancing measures (Čavojská et al., 2022; Clark et al., 2020; Daoust, 2020). In the present study, we expected women, older, higher educated, less religious and liberal-minded to be more willing to be involved in prosocial behavior during the pandemic (**H6**).

## Methods

### Participants and Procedure

The sample consisted of 500 participants (250 men, 250 women), aged between 18 – 86 years ( $M = 44.32$ ,  $SD = 15.66$ ), who were recruited by an external agency to be representative of the Slovak population concerning age and gender; 13.4% of the sample had an elementary or incomplete high school education, 46.2% had a complete high school education, and 40.4% had some college or a complete college education.

All methods were carried out following APA standards and were approved by the Ethical Board of Masaryk University as a part of the MSCA-IF grant (MSCAfellow3@MUNI). All materials and raw data are available at: <https://osf.io/fmtn3/>. Descriptive statistics for all measured variables are in Tables 1 and 2.

The survey took the form of an online questionnaire created in Qualtrics. The data were collected as part of a larger study of prosocial behavior about socially controversial topics (COVID-19, vaccination, climatic changes) but were intended to form a separate study. The participants first answered several demographic questions and then proceeded to the blocks of questions related to their

**Table 1** Descriptive statistics for all measured variables

	<i>M</i>	<i>SD</i>	skewness	kurtosis	Cronbach's $\alpha$
1. Behavior during pandemic	2.18	0.41	-0.56	0.27	0.49
2. Extraversion	3.24	0.72	-0.02	-0.34	0.74
3. Agreeableness	3.69	0.66	-0.27	-0.17	0.72
4. Conscientiousness	3.77	0.68	-0.30	-0.13	0.76
5. Negative emotionality	2.80	0.77	0.24	0.01	0.76
6. Openness	3.48	0.65	0.08	-0.47	0.67
7. Horizontal collectivism	3.58	0.73	-0.36	0.30	0.72
8. Vertical collectivism	3.39	0.70	-0.59	0.62	0.59
9. Vertical individualism	2.92	0.88	-0.27	-0.21	0.74
10. Horizontal individualism	3.51	0.79	-0.11	-0.28	0.63
11. Prosocial tendencies	3.41	0.45	-0.20	0.42	0.88
12. Future consequences	4.77	1.02	-0.19	0.53	0.85
13. Immediate consequences	3.72	1.08	0.06	-0.01	0.82
14. Helplessness	3.59	1.60	0.20	-0.78	0.90
15. Threat	4.62	1.44	-0.38	-0.34	0.84

**Table 2** Correlations of all measured variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Behavior during pandemic	—													
2. Extraversion	<b>0.16</b>	—												
3. Agreeableness	<b>0.29</b>	<b>0.20</b>	—											
4. Conscientiousness	<b>0.23</b>	<b>0.43</b>	<b>0.42</b>	—										
5. Negative emotionality	<b>-0.09</b>	<b>-0.40</b>	<b>-0.39</b>	<b>-0.48</b>	—									
6. Openness	<b>0.17</b>	<b>0.40</b>	<b>0.31</b>	<b>0.36</b>	<b>-0.30</b>	—								
7. Horizontal collectivism	<b>0.30</b>	<b>0.35</b>	<b>0.43</b>	<b>0.33</b>	<b>-0.26</b>	<b>0.32</b>	—							
8. Vertical collectivism	<b>0.31</b>	<b>0.21</b>	<b>0.36</b>	<b>0.25</b>	<b>-0.13</b>	<b>0.10</b>	<b>0.56</b>	—						
9. Vertical individualism	<b>0.10</b>	<b>0.28</b>	-0.01	<b>0.14</b>	<b>-0.16</b>	<b>0.09</b>	<b>0.29</b>	<b>0.28</b>	—					
10. Horizontal individualism	0.02	<b>0.29</b>	-0.03	<b>0.13</b>	<b>-0.09</b>	<b>0.33</b>	<b>0.12</b>	0.05	<b>0.19</b>	—				
11. Prosocial tendencies	<b>0.22</b>	<b>0.26</b>	<b>0.41</b>	<b>0.31</b>	<b>-0.15</b>	<b>0.29</b>	<b>0.53</b>	<b>0.40</b>	<b>0.09</b>	<b>0.10</b>	—			
12. Future consequences	<b>0.24</b>	<b>0.25</b>	<b>0.22</b>	<b>0.26</b>	<b>-0.12</b>	<b>0.30</b>	<b>0.37</b>	<b>0.31</b>	<b>0.20</b>	<b>0.24</b>	<b>0.48</b>	—		
13. Immediate consequences	<b>-0.12</b>	0.03	<b>-0.15</b>	<b>-0.11</b>	-0.04	<b>-0.10</b>	0.01	0.05	<b>0.14</b>	<b>0.10</b>	-0.02	<b>-0.14</b>	—	
14. Helplessness	<b>0.11</b>	0.00	-0.02	-0.08	<b>0.20</b>	<b>-0.10</b>	<b>0.09</b>	<b>0.21</b>	<b>0.12</b>	0.07	0.06	<b>0.15</b>	<b>0.21</b>	—
15. Threat	<b>0.28</b>	0.03	-0.01	-0.02	<b>0.18</b>	-0.04	<b>0.10</b>	<b>0.17</b>	<b>0.09</b>	0.04	0.09	<b>0.20</b>	0.06	<b>0.52</b>

Significant correlations are marked in bold. All correlations  $r \geq 0.199$  are significant at  $p < 0.001$ ; all correlations  $r \geq 0.123$  are significant at  $p < 0.01$ ; all correlations  $r \geq 0.090$  are significant at  $p < 0.05$

(1) individual differences (big five personality factors, collectivism/individualism, consideration for future consequences), (2) feelings of threat, and (3) prosocial behavior during the pandemic. The whole survey, which was in the Slovak language, took about 30 min to complete, and participants were remunerated for their participation by the external agency according to an internal scoring system with credit points or vouchers. The data set was complete and there were no missing data, as all the items in the survey were compulsory.

## Measures

### Outward Orientation

*Collectivism/Individualism* was measured using the Horizontal and Vertical Individualism and Collectivism scale (HVIC), which is a 14-item version (Sivadas et al., 2008) of the original 32-item HVIC (Singelis et al., 1995). The scale comprises four subscales. *Horizontal individualism* (HI) reflects the sense of being self-reliant without a tendency to compete with others. The subscale contains three items (e.g.,

“I enjoy being unique and different from others in many ways”). In contrast, the *vertical individualism* (VI) subscale focuses on competitively establishing one’s status and contains 3 items (e.g., “I enjoy working in situations involving competition with others”). *Horizontal collectivism* describes a tendency to acknowledge interdependence and value social relations and common goals. The subscale contains 4 items (e.g., “My happiness depends very much on the happiness of those around me”). Finally, the *vertical collectivism* subscale reflects a tendency to establish group hierarchy and compete with members of an out-group. The subscale contains four items (e.g., “I usually sacrifice my self-interest for the benefit of my group”). The HVIC scores are calculated by averaging relevant subscales items. Responses were made on a 5-point scale from strongly disagree (1) to strongly agree (5).

The *Consideration of Future Consequences* (CFC) describes the extent to which people consider the potential distant outcomes of their current behavior (Joireman et al., 2012). For the current study we used a Slovak translation (Čavojová & Jurkovič, 2017). The scale has 14 items forming two factors: CFC-Future (e.g., “When I make a decision, I think about how it might affect me in the future.”) and CFC-Immediate (e.g., “I only act to satisfy immediate concerns, figuring the future will take care of itself”). Each of the subscales comprises seven items evaluated on a 7-point scale from strongly disagree (1) to strongly agree (7). The scores are obtained by averaging the relevant items. The CFC scale was reported to predict a series of desirable health-related outcomes, such as, for instance, taking more exercises, controlling one’s diet or limiting sun exposure.

*Prosocial tendencies* were measured using 23 items from the Prosocial Tendencies Measure (PTM; Carlo & Randall, 2002; Slovak translation by Babinčák, 2011), which assesses 6 types of prosocial behavior – altruistic, compliant, emotional, dire, public and anonymous – which can be analyzed either separately or as a composite score. Exemplary items are: “I think that one of the best things about helping others is that it makes me look good” or “I never hesitate to help others when they ask for it” and participants responded on a 5-point scale (1 = *not at all like me*, 5 = *absolutely like me*).

### Emotional Reactions

*Feelings of helplessness* were measured using four items related to how a participant felt about COVID-19, e.g. “I feel helpless when thinking about the present situation caused by COVID-19” adapted from Šrol et al. (2021). In the items, we replaced the phrase “new coronavirus infection” with “COVID-19 pandemic”. Participants answered on a 7-point scale (1 = *completely disagree*, 7 = *completely agree*) and the mean score was used to indicate helplessness.

*Feelings of threat* were measured with three items, taken from Kohút et al. (2022), related to how threatened participants

felt by COVID-19 when thinking about their health, quality of life and economic and social consequences. Participants answered on a 7-point scale (1 = *not threatened at all*, 7 = *extremely threatened*).

### Personality

*Big five personality traits*. As a measure of personality, we used the Slovak version (Halama et al., 2020) of the Big Five Inventory-2 short form (Soto & John, 2017). It contains 30 Likert scale items measuring five broad personality factors: Extraversion, Agreeableness, Conscientiousness, Negative Emotionality and Open-Mindedness. Participants indicate their agreement or disagreement with the items using a 5-point scale ranging from “Disagree strongly” to “Agree strongly”.

### Outcome Measure

*Prosocial behavior during COVID-19* was measured using five self-reported items related to the behavior of participants during the pandemic. Participants indicated whether they actively looked out for people in need, provided emotional support, made selfish buying choices (reverse scored), restricted their social life and adhered to regulations. Participants chose their answers from three options, and we assigned 1 point for answers indicating most selfish answers (e.g. “I did not change my social life at all”), 2 points for answers indicating some action/willingness (e.g. “I limited the meetings only to those who did not mind meeting”) and 3 points for answers indicating action (e.g. “I limited my social life according to actually valid pandemic regulations”).

We conducted a confirmatory factor analysis to test whether the created items fit with the proposed one-factor model. The model showed acceptable fit to the data,  $\chi^2(5) = 23.54$ ,  $p < 0.001$ ,  $CFI = 0.96$ ,  $TLI = 0.92$ ,  $RMSEA = 0.086$ . One item (buying choices) had non-significant loading on its respective factor with a standardized estimate of  $-0.03$  ( $p = 0.642$ ). Because the item *buying choices* was problematic in that the answers were not in fact continuous (from a selfish answer to action) and CFA revealed this item did not significant load the factor, we decided to exclude it from the analysis. The internal consistency of the component is in Table 1.

Besides measured variables, participants answered several other questions related to their demographic information, political attitudes and the importance of religion.

## Results

First, we performed correlational analyses to see how behavior during the pandemic related to the other measured variables (Table 1) and demographic factors (Table 2).

More prosocial behavior during the pandemic correlated positively with Extraversion,  $r(498)=0.16, p=0.001$ ; Agreeableness,  $r(498)=0.29, p<0.001$ ; Conscientiousness,  $r(498)=0.23, p<0.001$ ; and Openness,  $r(498)=0.17, p<0.001$ ; and negatively with Negative emotionality,  $r(498)=-0.09, p=0.048$ . It also correlated moderately with both horizontal collectivism,  $r(498)=0.30, p<0.001$ ; and vertical collectivism,  $r(498)=0.31, p<0.001$ ; but only weakly with vertical individualism,  $r(498)=0.10, p=0.031$ . There was no correlation with horizontal individualism,  $r(498)=0.02, p=0.722$ . As expected, we also found a correlation with prosocial tendencies,  $r(498)=.022, p<0.001$ . Lastly, the behavior measure correlated positively with consideration for future consequences,  $r(498)=0.24, p<0.001$ ; negatively with immediate consequences,  $r(498)=-0.12, p=0.009$ ; and positively both with emotional measures – helplessness,  $r(498)=0.11, p=0.013$ ; and feelings of threat  $r(498)=0.28, p<0.001$ .

From demographic variables, women, more educated people, married people and more religious people tended to show more prosocial behavior during the pandemic (Table 3).

Lastly, we were interested in whether behavior during COVID-19 was best predicted by demographic variables, personality variables, outward preferences or feelings of threat and helplessness; therefore, we performed a hierarchical regression analysis (Table 4). A three-stage hierarchical multiple regression was conducted with behavior during COVID-19 as the dependent variable. Sex, age, education, political attitudes and religiosity were entered at step one; personality, collectivism/individualism, prosocial tendencies and consideration of future consequences were entered at step two; finally, emotional reactions were entered at step three. Sex was a nominal variable; all other variables (except age) were standardized for the regression analyses. Prior to conducting regression analyses we checked for the assumptions of linearity, multicollinearity, independence of residuals, constant variance of residuals, normal distribution of residuals and outliers. Scatterplots showed that an

assumption of a linear relationship between predictor variables and the outcome variable had been met. Analysis of collinearity statistics showed this assumption has been met, as VIF scores were well below 10 and tolerance scores above 0.2. The Durbin-Watson statistic was 2.02, so the assumption of independence of residuals was met. Our plot of standardized residuals vs. standardized predicted values showed no obvious signs of funneling, suggesting the assumption of homoscedasticity has been met. By inspecting the P-P plot we checked that the values of the residuals were also normally distributed. To test for any outliers affecting the data we checked the Cook's distance values; there were 12 outliers that were excluded from hierarchical regression analysis.

When all predictors were taken into account, feelings of threat emerged as the strongest predictor. Besides feelings of threat, other significant positive predictors of prosocial behavior were vertical collectivism, Conscientiousness, Agreeableness, liberalism and education.

## Discussion

While it is true that feeling threatened by the COVID-19 pandemic is the most reliable predictor of behavior that is most in line with the common good (not only following recommendations to protect others from exposure to the virus but also taking an active interest in their emotional well-being), it seems that another important – yet understudied – factor is vertical collectivism. Vertical collectivism encompasses such actions as preferring the in-group's welfare to one's own and sacrificing one's own comfort for the good of one's preferred group.

Most previous studies examined collectivism at the country level (Chen et al., 2021; Webster et al., 2021); thus, our results provide more fine-grained insight into how concern for others and putting their needs ahead of one's own help to promote group-protecting health behavior and greater support for members of the group. Moreover, both vertical and horizontal collectivism correlated with Agreeableness

**Table 3** Spearman correlations with demographic variables

	<i>M</i>	<i>SD</i>	Behavior during pandemic
1. Gender (men = 1, women = 2)			<b>0.12</b>
2. Age	44.32	15.66	0.08
3. Education			<b>0.14</b>
4. Marital status (married = 1, other [single, divorced, widowed] = 2)			<b>-0.14</b>
5. Number of people in a household	2.98	1.33	0.02
6. Conservatism/liberalism (very conservative = 1, very liberal = 7)	3.88	1.22	0.07
7. Importance of religion (not at all important = 1, very important = 7)	3.95	2.14	<b>0.12</b>

Significant correlations are marked in bold. All correlations  $\rho \geq 0.116$  are significant at  $p < 0.01$

**Table 4** Hierarchical regression analysis with behavior during COVID-19 as a dependent variable

	B	SE	$\beta$	t	p	95% CI	
						Lower	Upper
<i>Step 1</i>	1.936	0.074		26.127	0.000	1.790	2.082
sex (men = 1, women = 2)	0.089	0.033	<b>0.117</b>	2.673	0.008	0.023	0.154
age	0.003	0.001	<b>0.129</b>	2.889	0.004	0.001	0.005
education	0.061	0.016	<b>0.160</b>	3.670	0.000	0.028	0.093
conservatism/liberalism	0.060	0.018	<b>0.158</b>	3.431	0.001	0.026	0.095
religiosity	0.071	0.017	<b>0.187</b>	4.123	0.000	0.037	0.105
$F(5,482) = 9.65, p < 0.001, R^2 = 0.091$							
<i>Step 2</i>	2.067	0.074		27.909	0.000	1.921	2.212
sex (men = 1, women = 2)	0.066	0.034	0.087	1.944	0.053	-0.001	0.132
age	0.001	0.001	0.038	0.845	0.399	-0.001	0.003
education	0.035	0.016	<b>0.093</b>	2.196	0.029	0.004	0.067
conservatism/liberalism	0.057	0.017	<b>0.149</b>	3.413	0.001	0.024	0.090
religiosity	0.036	0.017	<b>0.094</b>	2.125	0.034	0.003	0.069
extraversion	-0.020	0.020	-0.051	-0.979	0.328	-0.059	0.020
agreeableness	0.039	0.021	0.102	1.885	0.060	-0.002	0.079
conscientiousness	0.052	0.020	<b>0.138</b>	2.641	0.009	0.013	0.091
negative emotionality	0.007	0.020	0.018	0.335	0.738	-0.033	0.047
openness	0.027	0.019	0.070	1.391	0.165	-0.011	0.065
horizontal collectivism	0.037	0.023	0.094	1.629	0.104	-0.008	0.081
vertical collectivism	0.058	0.021	<b>0.150</b>	2.781	0.006	0.017	0.098
vertical individualism	0.013	0.018	0.035	0.743	0.458	-0.022	0.049
horizontal individualism	-0.018	0.018	-0.047	-1.003	0.316	-0.053	0.017
prosocial behavior	-0.006	0.022	-0.017	-0.287	0.774	-0.050	0.037
future consequences	0.017	0.020	0.043	0.838	0.402	-0.022	0.056
immediate consequences	-0.027	0.017	-0.069	-1.589	0.113	-0.059	0.006
$F(17,470) = 7.87, p < 0.001, \Delta R^2 = 0.131$							
<i>Step 3</i>	2.072	0.072		28.812	0.000	1.930	2.213
sex (men = 1, women = 2)	0.057	0.033	0.075	1.722	0.086	-0.008	0.122
age	0.001	0.001	0.045	1.043	0.298	-0.001	0.003
education	0.035	0.016	<b>0.092</b>	2.225	0.027	0.004	0.065
conservatism/liberalism	0.055	0.016	<b>0.143</b>	3.381	0.001	0.023	0.087
religiosity	0.026	0.016	0.068	1.583	0.114	-0.006	0.058
extraversion	-0.023	0.019	-0.060	-1.189	0.235	-0.061	0.015
agreeableness	0.039	0.020	<b>0.104</b>	1.975	0.049	0.000	0.079
conscientiousness	0.050	0.019	<b>0.132</b>	2.613	0.009	0.012	0.088
negative emotionality	-0.010	0.020	-0.025	-0.482	0.630	-0.049	0.030
openness	0.032	0.019	0.083	1.688	0.092	-0.005	0.069
horizontal collectivism	0.037	0.022	0.095	1.699	0.090	-0.006	0.080
vertical collectivism	0.051	0.020	<b>0.132</b>	2.509	0.012	0.011	0.091
vertical individualism	0.007	0.018	0.019	0.408	0.684	-0.027	0.042
horizontal individualism	-0.015	0.017	-0.040	-0.894	0.372	-0.050	0.019
prosocial behavior	-0.006	0.022	-0.015	-0.270	0.788	-0.048	0.037
future consequences	0.002	0.020	0.004	0.089	0.929	-0.037	0.040
immediate consequences	-0.030	0.017	-0.078	-1.801	0.072	-0.062	0.003
helplessness (COVID)	-0.011	0.019	-0.028	-0.573	0.567	-0.047	0.026
threat (COVID)	0.094	0.018	<b>0.247</b>	5.269	0.000	0.059	0.129
$F(19,468) = 9.16, p < 0.001, \Delta R^2 = 0.049$							

Sex was coded as 1 for men and 2 for women. All other variables (except age) were standardized

and Conscientiousness, which are other strong predictors of more desirable behavior during the pandemic. As was shown by Blagov (2021), this can have implications for framing public health messages. Specifically, people who are more outwardly orientated and have more adaptive personality traits (such as Agreeableness and Conscientiousness) react positively to compassionate and responsible health messages and are more willing to restrict themselves to behave responsibly and in line with health recommendations. More individualistically oriented people (in combination with maladaptive personality traits), in turn, are more prone to ignore such messages and could be more responsive to self-centered health messages. In our study, we did not measure maladaptive personality traits, but Negative emotionality correlated negatively with measures of collectivism (but also individualism), prosocial behavior and future orientation, and positively with feelings of threat and helplessness, which suggests that people who are preoccupied with their negative emotions and fears may find it rather difficult to consider others' situation and needs.

Feelings of threat remained the strongest predictors of other-oriented behavior during the pandemic. To examine this relationship more deeply, we looked at how individual items in our threat measure correlated with other-oriented behavior during the pandemic. The strongest correlation was with the item related to feelings of worry about the health of self and close ones ( $r=0.36$ ), followed by feelings of worry about the quality of life of self and others ( $r=0.26$ ), and the weakest correlation was with worry about social and economic consequences ( $r=0.18$ ). This finding seems to be in line with our other results and the results of other studies: people who perceive COVID-19 as a health threat (either to themselves or others) are generally more willing to comply even with regulations that are restrictive to them; being agreeable, conscientiousness and more collectivistically oriented probably helps to see the necessary restriction to one's comfort as contributing to the "common good". On the other hand, an economic threat was shown to be a predictor of having more questionable health beliefs and avoiding preventive regulations in another study (Čavojská et al., 2022). Economic threat is also connected with lower life satisfaction during the pandemic (Kohút et al., 2022). Similarly, Imbriano et al. (2021) found that neither perceived risk of contracting the disease, nor perceived risk of being seriously ill correlated with health behavior, but that only perceived economic, social and emotional costs did. It seems that the more people view the personal consequences of the disease as negative, the more willing they are to engage in restrictive health behaviors. On the other hand, if they view the costs of restrictive behavior as negative for themselves, they will avoid such regulations. Framing health messages in terms of gains and costs may thus affect more self-centered individuals to comply with restrictive regulations and

ultimately contribute to the common good. Such messages, however, may have a limited potential to spill over into the domains of prosocial behavior that do not directly protect an individual but, instead, focus on others' well-being, for instance by providing them with emotional support.

The pandemic evoked many negative emotions, and it seems important to distinguish between these emotions, as they can have different effects on behavior. Although both feelings of threat and helplessness were correlated with behavior during the pandemic, correlations with helplessness were weaker and only threat remained as a significant predictor in regression analysis. While this could be caused by a relatively strong relationship between the two measures, some studies found helplessness to be correlated with more passive responses to the pandemic and as a part of wider depressive symptoms (Lifshin & Mikulincer, 2021; Morgul et al., 2021).

Our results also corroborate the results of Dryhurst et al. (2020), who found (using an international sample of  $N=6991$  from ten countries) that perceived risk of the coronavirus was associated with experience with the virus, social amplification (through information received from family and friends), prosocial orientation and individualistic worldviews (measured using the cultural cognition scale by Kahan, 2012). Similarly, they also found a gender effect: men perceived less risk. Also in our study, women reported more prosocial behavior, which was connected with their higher feelings of threat.

Lastly, demographic factors were associated with outwardly-oriented behavior during the pandemic. Being more educated, liberal and religious were predictive of behavior, but interestingly, only education and liberal orientation remained significant predictors, once outward orientation and emotional reactions were introduced into the model. The findings are in clear contrast with comprehensive global surveys showing that women consistently behave more altruistically and prosocially than men throughout the world (Falk & Hermle, 2018; Falk et al., 2018). Although women reported slightly more prosocial behavior during the pandemic than men, biological sex lost significance in the model with outward orientation. The extant literature explains the universal pattern by women's greater empathy and empathetic concern. However, regardless of gender, individuals scoring similarly high in empathy reported similar levels of prosocial behavior, including charitable giving and volunteering, and behaved similarly in a series of experimental games (Kamas & Preston, 2021; Willer et al., 2015). It is possible that characteristics related to outward orientation in our study play a similar role as empathy and, analogically, take over the explanatory role of sex.

Unlike gender, political preferences show mixed relations with other-regarding behavior (Grünhage & Reuter, 2021). The present study corroborates the view that, despite



being less religious, liberally-minded people may show more prosocial behavior than conservatives. Specifically, during the COVID-19 pandemic, individuals scoring high in Social Dominance Orientation and Right Wing Authoritarianism reported lower willingness to get involved in prosocial behavior, including shopping for others or providing emotional support (Politi et al., 2021). It seems that while being religious is more strongly correlated with outwardly-oriented behavior than being liberal, there is a curious interplay with other factors. Being liberal correlates negatively with being religious ( $r = -0.25, p < 0.001$ ), and many studies found that conservative people tend to feel less threatened by COVID-19 and thus reject prevention measures more than liberal people (Conway et al., 2021; Samore et al., 2021). Politi et al. (2021) also suggested that liberal orientation itself could involve elements of collectivistic and cooperative orientations that predispose liberally-minded individuals to adopt more prosocial behaviors during a social crisis such as the pandemic. Since the associations are correlational, it seems equally likely that individuals with stronger altruistic or prosocial sentiments describe themselves as more liberal due to congruent values (Zettler & Hilbig, 2010), while conservatives remain individualistically and competitively focused and, thus, less willing to provide assistance to those in need (Van Lange et al., 2011). Although the present study provides no evidence concerning the direction of the relation between political orientation and prosocial behavior, it seems that at the end of the day, some Covid-related prosocial behaviors could be perceived through political lenses rather than through an apolitical focus on the common good. Or, alternatively, partisan views could disturb the understanding of the seriousness of the situation and what the common good during the pandemic really is.

### Limits of the Study and Future Directions

We are aware of several limitations of our study. Firstly, the study was cross-sectional; therefore, no causal inferences can be made. Secondly, though it would be best to measure actual behavior, we could measure only the self-reported behavior of participants; thus, it is possible that at least some of them gave answers that were more socially acceptable than in fact true to how they actually behave. Further, our measure of prosocial behavior had some limitations. Despite our efforts to construct it in a way to ask about actual behavior in a non-judgmental way, so as to not promote desirability bias, it was difficult to come up with many easily observed instances of Covid-related prosocial behavior. Also, we had to exclude items that reflected negatively in the relatively low internal consistency of the measure, and thus the results should be taken with caution and should be replicated.

Next, typically, there is a gap between how people perceive their contribution and how others see them. Future research could at least partially address this issue by adding a measure of social desirability or focusing on actual behavior instead of self-reports – for instance, through experimental designs.

Finally, we did not control for financial status, which could be related to prosocial and altruistic behaviour, with more recent studies indicating that prosocial tendencies do not decline with wealth or socioeconomic status (Andreoni et al., 2021). Experimental evidence also corroborates the view that prosocial behaviour – expressed as a willingness to donate in the Dictator Game – increases with individuals' initial endowment (Chowdhury & Jeon, 2014). Instead, in the present study, we asked participants about their educational attainment – which could serve as a proxy for socioeconomic status – and this variable correlated weakly with prosocial behaviour. However, in the hierarchical regression, education remained significant even after emotional reactions and outward orientation entered the model. Despite the limitations, we believe that our study offers some valuable insights into what factors are associated with more outward-oriented responses during difficult times, such as the current pandemic. Particularly, the size of our sample allowed us to detect even small effect sizes with high statistical power. We also aimed at the high representativeness of our sample, which together with statistical power allow us some optimism concerning the reliability of the findings. Future research could also delve deeper into the existence, properties and associations of the latent variable of outward orientation. Our results provide the first and preliminary insights into the possible existence of the construct, and a more thorough investigation and validation is required to substantiate our findings.

### Conclusion

How you behave during a pandemic and whether you take into account the common good depends largely on whether you perceive the threat to the society posed by the disease as grave, but also on your willingness to sacrifice some comforts for the sake of other people. While focusing on the threat posed by the pandemic may have some immediate impacts on compliance with containment measures, it may also elicit unwanted emotional responses, including heightened anxiety and helplessness. The importance of our findings lie in indicating that vertical collectivism has also a considerable potential not only to increase compliance but also to promote more general prosocial behavior during a pandemic. Thus, appealing to collectivistic sentiments could ultimately strengthen social bonds and contribute to the well-being of all affected by the pandemic. Together with

the results about the relation between perceived threats or costs of COVID-19 and prosocial behavior, the present study offers insights into how to tailor communications to promote not only public health but also the common good during the pandemic. Specifically, it seems important to shape the messages to highlight that the most effective method of mitigating the negative consequences of the pandemic – both for individuals and society – is to put joint effort in socially profitable actions. Moreover, it is necessary not only to perceive the situation as threatening but also to feel that our actions can make difference, that each and every contribution to containing the pandemic is ultimately a contribution to the society's common good and other people's well-being. It seems that building a society around shared values and fostering the sensitivity to the others' needs – both reflected in outward orientation – is the very first and a necessary step in pursuit of the common good.

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**Data Availability** <https://osf.io/fmtn3/>

## Declarations

**Conflict of Interest** The Authors declare that there is no conflict of interest.

**Ethics Approval and Consent to Participate** All methods were carried out in accordance with APA standards and ethical requirements of the Slovak Academy of Sciences. The study was approved by the Ethical Board of Masaryk University as a part of the MSCA-IF grant (MSCAfellow3@MUNI). Informed consent was obtained from all subjects.

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