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Prosocial orientation and COVID-19 vaccine willingness in the U.S.

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Abstract

Despite evidence of the safety and effectiveness of COVID-19 vaccines and their wide availability, many in the U.S. are not vaccinated. Research demonstrates that prosocial orientations predict COVID-19 health behaviors (e.g., social distancing) and vaccination intentions, however, little work has examined COVID-19 vaccination willingness in the U.S. since vaccines were approved. Findings from two U.S. samples show that, in contrast to other COVID-19 health behaviors, vaccine willingness in unvaccinated people is unrelated to prosocial orientation. Study 2 demonstrates that the lack of association between vaccine willingness and prosocial orientation in unvaccinated participants was specific to those with stronger beliefs that COVID-19 vaccines are ineffective. Thus, in prosocial people, perceptions of vaccines' ineffectiveness may undermine COVID-19 vaccine willingness.

KEYWORDS
altruism, health psychology, motivation, social psychology, social psychology and personality

1 | INTRODUCTION

On 11 December 2020, the U.S. FDA granted emergency authorization for vaccines to protect against illness and death resulting from SARS-CoV-2 infection. Approved vaccinations reduce the likelihood of becoming infected with

COVID-19 and reduce the chances of symptomatic illness, hospitalization, and death (Ferdinands et al., 2022). Vaccination is the single most effective behavior people can do to protect themselves (Mazur, 2022). Researchers estimate that vaccination could have prevented hundreds of thousands of deaths (Amin et al., 2022).

Despite evidence of the safety and effectiveness of COVID-19 vaccines and the importance of vaccination in preventing the spread of COVID-19 (Fiolet et al., 2022; Pritchard et al., 2021; Zheng et al., 2021), many U.S. residents have not been fully vaccinated or boosted. Although vaccines have been approved since December 2020 and widely available since the Spring of 2021, less than 70% of the U.S. population is fully vaccinated (*Centers for Disease Control and Prevention*, n.d.).

Vaccine willingness may be related to prosocial orientation—how much people want to support others' well-being (e.g., Canevello & Crocker, 2020). Even prior to the COVID-19 pandemic, researchers viewed vaccination as a prosocial behavior because vaccinations incur some personal costs (e.g., time, risk of adverse effects), but protect oneself and others (Böhm et al., 2019; Korn et al., 2020; Shim et al., 2012). In the context of COVID-19, vaccines reduce the likelihood of transmitting the virus (e.g., Eyre et al., 2021; Prunas et al., 2022; Tan et al., 2023). Thus, prosocially-oriented people may be more willing to be vaccinated compared to people who are low in prosocial orientation. Consistent with these ideas, studies conducted around the globe show that vaccination intentions are associated with prosocial orientations (e.g., Burke et al., 2021; Drążkowski et al., 2022; Enea et al., 2022; Leonhardt & Pezzuti, 2022; Oleksy et al., 2022; Pfattheicher et al., 2022; Rieger, 2020; Santirocchi et al., 2022; Strupat et al., 2022; Yu et al., 2022; Zagefka et al., 2022), but see (Rosman et al., 2021).

However, few studies of prosociality and COVID-19 vaccination willingness have been conducted in the U.S. In one study conducted before COVID-19 vaccines were available, prosociality predicted greater vaccine willingness, but only among participants from less densely populated areas (Jung & Albarracín, 2021). In another study conducted after vaccines were available, participants' contributions during a public goods game correlated with their desire for vaccination (Reddinger et al., 2022).

Much research has focused on other COVID-19 health behaviors. For example, general prosocial orientations predict COVID-19 health behaviors, including hand-washing and mask-wearing (e.g., Ospina et al., 2021). In particular, empathic concern and compassionate goals to support the well-being of others and oneself predict how frequently people report performing these COVID-19 health behaviors even after accounting for associations with political ideology, egoistic selfishness, socially desirable responding, and gender (Ospina et al., 2021).

Thus, despite evidence that prosocial orientation predicts other COVID-19 health behaviors and evidence that vaccination reduces the likelihood of infection, illness, and death for oneself and others, research on the role of prosocial orientation and willingness to be vaccinated in the U.S. is sparse. Much of this research was conducted prior to the approval of COVID-19 vaccinations, prior to evidence regarding real-world efficacy and the spread of misinformation about the vaccines.

The present studies explored whether prosocial orientation predicts willingness to be vaccinated, and whether prosocial orientation predicts vaccine willingness as strongly as they predict other COVID-19 health behaviors. Because people who are skeptical that vaccines prevent infection, illness, and death may be reluctant to be vaccinated even if they are highly prosocial, we also tested whether the effect of prosocial orientation on vaccine willingness is moderated by beliefs about vaccine efficacy. Study 1 was conducted when vaccines were available but remained difficult for some people to obtain and when misinformation and politicization of vaccines were proliferating. Study 2 was conducted when the delta variant predominated amid a fourth surge of infections, and the head of the CDC called COVID-19 a "pandemic of the unvaccinated" (Anthes & Petri, 2021).

1.1 | Transparency and openness

Data from these studies are previously unpublished. In each study, we report how we determined sample sizes and all data exclusions. These studies did not include manipulations and were part of investigations that included

other variables. Relevant data, syntax, and information about materials for all studies are available at https://osf.io/nsvq7/?view_only=c32d0be66d01416e8c96e4246df284e4.

Data were analyzed using SPSS version 26. We compared the relative strength of associations using the tool developed by Lee and Preacher (2013) for testing the difference between two dependent correlation coefficients. Power analyses were conducted using G*Power (Faul et al., 2007). Table S1 reports sample demographics for both studies.

2 | STUDY 1

2.1 | Method

2.1.1 | Participants

We recruited 433 U.S. adults from CloudResearch on 19 March 2021, for a study about their thoughts, feelings, and behaviors regarding the COVID-19 pandemic. Participants received $1.50 for participating. We excluded 139 participants who had received at least one vaccination or did not report their vaccination status and 32 participants for failing at least one data quality check (see Table S2). Final analyses included 262 unvaccinated participants. Using the effect sizes from secondary analyses of data reported by Ospina et al. (2021; Study 3, see Supporting Information S1: SOM 4), we conducted a post hoc power analysis for tests of whether two dependent Pearson correlation coefficients differ. This sample provided power of 0.999 to detect effect sizes similar to those found in Ospina et al. (2021).

2.1.2 | Measures

Participants completed measures of prosocial orientation, COVID-19 vaccine willingness, COVID-19 health behaviors, and demographic information. Internal reliabilities for all measures appear on the diagonal of Table 1.

Prosocial orientation
Following Ospina et al. (2021), we assessed prosocial orientation using the compassionate goals scale (Crocker & Canevello, 2008), which assesses prosocial intentions to be supportive and not harm others and is strongly correlated with other prosocial orientation measures (Canevello & Crocker, 2020). Items began with the phrase "In the past month, in my relationships with others, I wanted or tried to:" Participants rated eight items, such as "Be supportive of others" on a scale from 1 (*Not at All*) to 5 (*Extremely*).

COVID-19 vaccine willingness
We measured COVID-19 vaccine willingness using the Oxford COVID-19 Vaccine Hesitancy Scale (Freeman et al., 2022). Instructions stated, "these questions ask how you would respond if you were offered a COVID-19 vaccine" and were followed by six items, such as: "If a COVID-19 vaccine was available at my local pharmacy I would…"

TABLE 1 Study 1 correlations, means, standard deviations, and Cronbach's alphas.

	1.	2.	3.	M (SD)
1. Prosocial orientation	0.92			3.87 (0.76)
2. COVID-19 willingness to vaccinate	0.04	0.98		−0.01 (0.95)
3. COVID-19 health behaviors	0.39***	0.48***	0.94	4.12 (0.84)

Note: N = 262. Prosocial orientation and COVID-19 health behaviors were measured on five-point scales; COVID-19 vaccine willingness scores were standardized. Across measures, higher values indicate higher levels of the construct. Internal reliabilities appear on the diagonal.

***$p < 0.001$.

rated on scales with 1 indicating low endorsement and 5 indicating high endorsement of the vaccine. Because of an error in administering the measure, one item was rated on a four-point scale. Accordingly, we standardized each item before creating a composite.

COVID-19 health behaviors

Following Ospina et al. (2021), participants rated how often in the previous month they engaged in 16 COVID-19 health behaviors (Hutchins et al., 2020), such as "If I had to go out in public, I stayed at least 6 feet away from others." Items were rated on a scale from 1 (*Never true of me*) to 5 (*Always true of me*).

2.2 | Results

Table 1 reports means, standard deviations, coefficient alphas, and correlations among all Study 1 measures. Prosocial orientation was uncorrelated with COVID-19 vaccine willingness, $r(259) = 0.04$, $p = 0.575$, but positively correlated with COVID-19 health behaviors, $r(259) = 0.39$, $p < 0.001$. The difference between these correlation coefficients was significant, $z = 5.92$, $p < 0.001$. Thus, prosocial orientation was more strongly related to COVID-19 health behaviors than to COVID-19 vaccine willingness among unvaccinated adults 3 months after the first vaccines had been approved in the U.S.

These findings were not related to participants' race, socioeconomic status, political ideology, general health motivation, or perceived risk of severe illness from the COVID-19 virus (see Supporting Information S1: SOM 1).

2.3 | Discussion

In an unvaccinated U.S. sample when COVID-19 cases were surging and vaccines had been in use for approximately 3 months, prosocial orientation predicted COVID-19 preventative behaviors, but not COVID-19 vaccine willingness. These results suggest that the psychology of COVID-19 vaccine willingness differs from that of other COVID-19 preventive behaviors.

Study 2 addressed three additional questions. First, the lack of an association between prosocial orientation and vaccine willingness might be due to the compassionate goals scale. Although this measure has proved useful since it was developed (see Crocker & Canevello, 2012, for a review), and predicted COVID-19 health behaviors in four independent samples (Studies 1–3 in Ospina et al., 2021, and Study 1 here), the compassionate goals scale is relatively new (Crocker & Canevello, 2008). In Study 2, we included other more established measures of prosocial orientation: communal orientation, which assesses prosocial norms in relationships (Clark et al., 1987), and empathic concern, which assesses tender-hearted concern for others in distress (Davis, 1983). We examined whether the results of Study 1 replicate with these measures.

Second, Study 1 included only unvaccinated participants. Study 2 included unvaccinated and vaccinated participants, which allowed us to test whether Study 1 findings can be generalized.

Third, Study 2 tested whether the association between prosocial orientations and vaccine willingness depends on whether people declined the COVID-19 vaccine because it does not protect oneself and others from infection. We hypothesized that prosocial orientations would be less strongly linked to vaccine willingness among those who believed that the vaccines were ineffective at protecting the self and others from infection.

We conducted Study 2 in November 2021, prior to news that the Omicron variant had been discovered.

3 | STUDY 2

Study 2 was preregistered at Open Science Framework (osf.io/za52h) on 2 November 2021. We preregistered the hypothesis that for unvaccinated people, the association between compassionate goals and COVID-19 health behaviors is stronger than the association between compassionate goals and vaccination willingness. The study

reported below expands on this hypothesis by testing a composite of prosocial orientation that includes compassionate goals, communal orientation, and empathic concern. Supporting Information S1: SOM 2 reports detailed findings that support our original preregistered hypothesis. Study 2 also reports comparative associations for vaccinated participants.

Our primary goal in Study 2 was to examine associations in unvaccinated participants. An a priori power analysis indicated that 275 unvaccinated participants would provide 80% power to detect an effect of similar size to Study 1. We planned to recruit 1100 participants, anticipating that 30% of participants would be unvaccinated and 10% of them would fail data quality checks.

3.1 | Method

3.1.1 | Participants

We recruited 1107 U.S. adults between the ages of 18 and 64 in CloudResearch for a study about COVID-19 vaccine willingness between 3 and 8 November 2021. Participants received $1.80 for participating. We excluded 34 participants for failing at least one data quality check (see Table S3); 66 were excluded because they received one dose of a two-shot series; one was excluded for not meeting age criteria. The final sample included 1006 participants (747 fully vaccinated; 259 unvaccinated).

3.1.2 | Measures

Participants reported their COVID-19 vaccine status and completed measures of COVID-19 vaccine willingness, COVID-19 health behaviors, prosocial orientation, and demographic information. Unvaccinated participants indicated how much they would decline the COVID-19 vaccine because it does not protect. Internal reliabilities appear on the diagonal of Table 2. The measure of COVID-19 health behaviors was identical to that used in Study 1.

Prosocial orientation

We assessed prosocial orientation using three measures: compassionate goals (using the items described in Study 1), communal orientation, and empathic concern. Participants were asked to rate these measures with respect to their experiences in general. For all measures, items were rated on scales from 1 (*Not at all/Not at all characteristic of me*) to 5 (*Extremely/Very characteristic of me*).

We used the measure developed by Clark et al. (1987) to assess communal orientation. Participants rated 14 statements such as "I believe people should go out of their way to be helpful."

TABLE 2 Study 2 zero-order correlations, means, and standard deviations in unvaccinated (lower diagonal) and vaccinated (upper diagonal) participants.

	1.	2.	3.	4.	Unvaccinated M (SD)	Vaccinated M (SD)
1. Prosocial orientation	0.87	0.18***	0.26***	—	3.80 (0.70)	3.91 (0.64)
2. COVID-19 vaccine willingness	−0.02	0.98	0.35***	—	2.24 (1.01)	4.34 (0.91)
3. COVID-19 health behaviors	0.22***	0.33***	0.92	—	3.64 (0.91)	4.01 (0.71)
4. Vaccines not protective	0.18**	−0.56***	−0.17**	0.90	2.80 (1.34)	—

Note: $N_{\text{unvaccinated}}$ = 259. $N_{\text{Vaccinated}}$ = 747. All constructs were measured on five-point scales and were scored such that higher values indicate higher levels of the construct. Internal reliabilities appear on the diagonal. Vaccinated participants did not report on the extent to which they did not get the vaccine due to beliefs about its ineffectiveness.

**p < 0.01. ***p < 0.001.

We used Davis' (1983) measure of empathic concern. Participants rated how characteristic six statements were of them such as "I often have tender, concerned feelings for people less fortunate than me."

Because the three measures of prosocial orientation were strongly correlated ($rs > 0.65$), we combined them into a single composite score for all Study 3 analyses. Supporting Information S1: SOM 2 reports Study 2 analyses separately for each measure of prosocial orientation.

COVID-19 vaccine willingness

We measured COVID-19 vaccine willingness using the measure described in Study 1. Unvaccinated participants were asked about their willingness to receive a COVID-19 vaccine; vaccinated participants were asked about their willingness to receive a COVID-19 booster vaccine.

Declining the COVID-19 vaccine because it does not protect

Unvaccinated participants indicated to what extent they did not get the vaccine due to beliefs about its (in)effectiveness. One item assessed ineffectiveness at protecting oneself (i.e., "because getting vaccinated would not protect me from being infected with COVID-19"); three items assessed ineffectiveness at protecting close others (e.g., "because my getting vaccinated would not protect those I live with from being infected with COVID-19"; $\alpha = 0.94$); and three items assessed ineffectiveness at protecting distant others (e.g., "because my getting vaccinated would not protect people in my community from being infected with COVID-19"; $\alpha = 0.96$). Because these three subscales were highly correlated ($0.63 \leq r \leq 0.83$), we averaged them to create a composite.

3.2 | Results

Table 2 shows the correlations, means, and standard deviations for all Study 2 measures.

First, we tested whether prosocial orientation differentially predict COVID-19 vaccine willingness and COVID-19 health behaviors in unvaccinated participants. The association between prosocial orientation and COVID-19 vaccine willingness was nonsignificant, $r(257) = -0.02$, $p = 0.799$, whereas the association between prosocial orientation and COVID-19 health behaviors was significant, $r(257) = 0.22$, $p < 0.001$. As in Study 1, prosocial orientation was more strongly related to COVID-19 health behaviors than to COVID-19 vaccine willingness, $z = 3.23$, $p < 0.001$.

We conducted parallel analyses in vaccinated participants. Prosocial orientation was positively correlated with vaccine willingness ($r(743) = 0.18$, $p < 0.001$) and COVID-19 health behaviors ($r(743) = 0.26$, $p < 0.001$). Prosocial orientation was more strongly related to COVID-19 health behaviors than to COVID-19 vaccine willingness ($z = 1.88$, $p = 0.030$).

Next, we tested whether these associations differed by vaccine status. We used model 1 in PROCESS, version 4.1 (Hayes, 2022) to conduct two moderation analyses in which prosocial orientation was the predictor, vaccine status was the moderator, and COVID-19 vaccine willingness and COVID-19 health behaviors were the outcomes. All continuous variables were standardized.

For COVID-19 vaccine willingness, the interaction was significant ($t(1000) = 2.88$, $p = 0.004$, $\Delta R^2 = 0.004$). The association between prosocial orientation and COVID-19 vaccine willingness was significant for those who were vaccinated ($\beta = 0.13$, $t(1000) = 4.92$, $p < 0.001$, 95% CI[0.08, 0.19]), but not for those who were unvaccinated ($\beta = -0.01$, $t(1000) = -0.28$, $p = 0.780$, 95% CI[−0.10, 0.07]). For COVID-19 health behaviors, the interaction was not significant ($t(1002) = 0.08$, $p = 0.937$, $\Delta R^2 < 0.001$). These findings suggest a stronger disconnect between prosocial orientation and COVID-19 vaccinate willingness for those who are unvaccinated.

To understand the lack of association between prosocial orientations and COVID-19 vaccine willingness in unvaccinated participants, we focused on their reasons for not getting vaccinated. We hypothesized that unvaccinated participants who declined the vaccine because they believed that it would not protect the self and others from infection would show weaker associations between prosocial orientations and COVID-19 vaccine willingness,
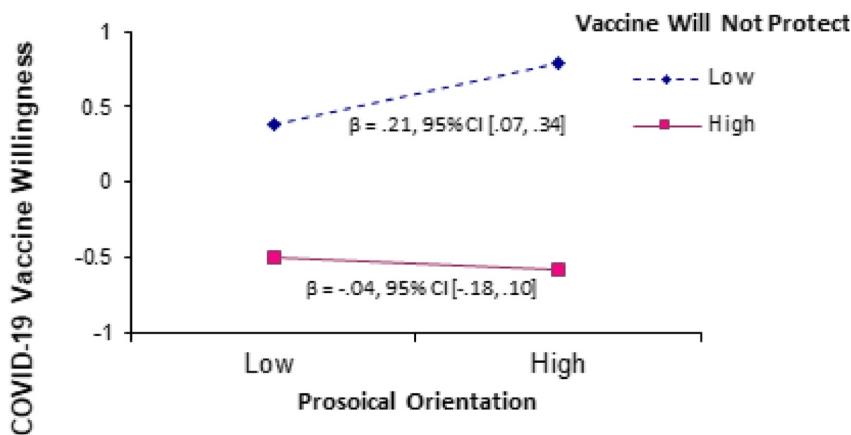
FIGURE 1 Study 2: prosocial orientations predicting COVID-19 vaccine willingness by belief that the vaccine is not protective in unvaccinated participants. All variables were standardized and measured on 1–5 scales. The mean for COVID-19 vaccine willingness was 2.24 (SD = 1.01).

compared to those who had lower endorsement of this reason for declining the vaccine. We tested a model in which prosocial orientation was the predictor, declining the vaccine because it would be ineffective was the moderator, and vaccine willingness was the outcome. The interaction was significant, $t(255) = -2.59$, $p = 0.010$, $\Delta R^2 = 0.02$. Figure 1 shows that the association between prosocial orientation and vaccine willingness was significant among participants who were *less* likely to say they would decline the vaccine because it is ineffective, $\beta = 0.21$, $t(255) = 2.96$, $p = 0.003$, 95% CI[0.07, 0.34], but not those who were higher in saying they would decline the vaccination because it is not protective, $\beta = -0.04$, $t(255) = -0.58$, $p = 0.562$, 95% CI[−0.18, 0.10]. Study 2 findings were not due to participants' race, socioeconomic status, political ideology, or perceived risk of severe illness from the COVID-19 virus (see Supporting Information S1: SOM 1).

3.3 | Discussion

In Study 2, prosocial orientation was related to COVID-19 preventative behaviors but unrelated to COVID-19 vaccine willingness among unvaccinated and vaccinated adults. This pattern is not specific to compassionate goals, which is a relatively new construct in the literature. Other measures of prosocial orientations show the same pattern.

Study 2 also demonstrates that the lack of association between prosocial orientation and vaccine willingness was specific to unvaccinated participants who had stronger beliefs that the vaccine is ineffective. For vaccinated participants and unvaccinated participants who had weaker beliefs that the vaccine was ineffective, prosocial orientations predicted greater willingness to become vaccinated.

4 | GENERAL DISCUSSION

Many people in the U.S. have not been fully vaccinated or boosted, despite evidence of the safety and effectiveness of COVID-19 vaccines, and their wide availability. Across two studies,[1] prosocial orientations were consistently unrelated to vaccine willingness for unvaccinated participants, whereas prosocial orientations were consistently related to greater COVID-19 health behaviors, such as hand-washing and mask-wearing. Study 2 findings suggest that this disconnect between prosocial orientation and vaccine willingness in unvaccinated participants can be explained by beliefs that the COVID-19 vaccine would not protect the self and others from becoming infected.

Together, these findings support previous work suggesting that people's hesitation to be vaccinated for COVID-19 is nuanced. Research has emphasized the role of prosociality in vaccine willingness for general disease prevention (see Böhm & Betsch, 2022, for a review). However, evidence also suggests that this link depends on other factors. For example, prosocial concerns relate to greater vaccine willingness and perceived effectiveness of flu and COVID-19 vaccines more strongly in sparsely populated environments (Jung & Albarracín, 2021). Our results align with this work to suggest that caring about the welfare of others may only be part of the story and that it is important to consider people's beliefs that receiving the vaccine will actually help prevent others from contracting disease.

These findings also suggest that it may be inaccurate to assume that people who do not get the COVID-19 vaccine are unconcerned with others' well-being. Public health interventions seeking to increase vaccine willingness in the general population may benefit from targeting not only the collective benefits of vaccination (Böhm & Betsch, 2022), but also perceptions of vaccine effectiveness. The "epidemic of the unvaccinated" may not be an epidemic of the uncaring, but rather an epidemic of the misinformed.

DATA AVAILABILITY STATEMENT

All materials, data, and syntax used in this manuscript are available at https://osf.io/nsvq7/?view_only=c32d0be66d01416e8c96e4246df284e4.

ETHICS STATEMENT

Study 1 was approved by the Institutional Review Board at the University of North Carolina, Charlotte (Protocol #IRIB-21-0351). Study 2 was approved by the Institutional Review Board at The Ohio State University (Protocol #2019B0248). All authors have complied with the APA ethical standards in treatment of the study participants.

PARTICIPANT CONSENT STATEMENT

Consistent with APA policy, the rights of the participants were fully protected in this research and all participants provided consent prior to participation.

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ENDNOTE

[1] Findings from secondary analyses of data reported by Ospina et al. (2021; Study 3) mimic the pattern of results from Studies 1 and 2 (see Supporting Information S1: SOM 4).

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SUPPORTING INFORMATION

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