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Investigating the role of adversity and benevolence beliefs in predicting prosociality

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Abstract

Background: Does experiencing adversity engender kindness, and if so, for whom? Two studies tested the hypothesis that adversity predicts increased pro-social outcomes, and that this relationship is strongest for individuals who view others as good and trustworthy, or *benevolent*.

Method: In Study 1, a cross-sectional survey design was utilized, and in Study 2 a longitudinal survey was conducted.

Results: In Study 1 ($N = 359$), the number of lifetime adverse life events was associated with increased volunteering, empathic concern, and self-reported altruism. The association of adversity and altruism was stronger for those with greater benevolence beliefs. In Study 2 ($N = 1157$), benevolence beliefs were assessed, and in subsequent years, adverse life events were reported. The number of past-year adverse life events predicted more volunteering and charitable involvement, but only among people with high benevolence beliefs.

Conclusion: Exposure to adversity may be associated with increased pro-social behavior among those with higher benevolence beliefs. In part, this could be due to benevolence beliefs increasing the expectation that one's efforts will be appreciated and reciprocated.

KEYWORDS

adversity, altruism, benevolence, charity, empathy, pro-social behavior, suffering, volunteering, worldviews

1 | INTRODUCTION

Does experiencing adversity engender kindness? A large literature attests to the fact that people frequently *perceive* positive changes in themselves following traumatic or highly negative life events. These positive changes can include pro-social outcomes such as empathy and altruism (e.g., Calhoun & Tedeschi, 2014; Helgeson et al., 2006; Zoellner & Maercker, 2006). However, there is relatively little literature documenting *actual* associations between the experience of negative life events (NLE) and prosociality. Moreover, there is a lack of research examining the

boundary conditions under which prosociality might—or might not—arise from experiences with adversity.

In the present research, we discuss the rationale and evidence for an association between adversity, in the form of negative life events, and prosociality. We also explore individual differences in this association. We then provide evidence from two studies showing that in general, increased adversity does predict increased prosociality. Further, this association may be strongest for individuals who, before experiencing negative life events, perceived that others tend to be benevolent.

1.1 | Adversity and prosociality

Why might adversity lead to prosociality? One answer may be that experiencing a specific type of adversity makes it easier to understand, and connect with, others with similar experiences (e.g., Batson et al., 1996; Hodges et al., 2010; Loewenstein & Small, 2007; but for limitations of this effect, see Ruttan et al., 2015). However, it is also possible that experiencing adversity, in general, could promote empathy and altruism.

There are some existing data to suggest that negative life events in general are positively associated with prosociality. For example, Frazier et al. (2013) found that greater *lifetime* NLE was associated with higher levels of daily helping behaviors and volunteering. Furthermore, those who experienced *recent* negative events reported greater levels of daily helping, compared to those who had not experienced recent adversity. Similarly, Lim and DeSteno (2016) found that individuals with more frequent and severe negative life events demonstrated more empathy (perspective-taking and empathic concern), and also engaged in more helping behavior. The same researchers found that adversity also bolsters compassion for multiple suffering victims (Lim & DeSteno, 2020). Several studies also suggest that victimization or suffering promotes helping behavior both within (Klar, 2016) and between groups (Vollhardt & Staub, 2011; Warner et al., 2014). Aside from lifetime adversity, specific adverse events may also affect prosociality. Namely, Vardy and Atkinson (2019) found that experiencing a natural disaster, and specifically exposure to other people in distress, predicted more pro-social allocations.

1.2 | Prosociality after adversity: A moral dimension

While adversity may increase prosociality in general, there are reasons to expect that this association might not be uniform across the population, as there is heterogeneity in many kinds of responses to negative life events. Prior research has identified a variety of predictors of perceived positive outcomes of adversity, such as coping strategies and personality traits (e.g., Calhoun et al., 2000; Danhauer et al., 2013; Henson et al., 2021; Widows et al., 2005). When considering what factors might influence the association between adversity and prosociality, in particular, it may be helpful to consider why people are pro-social at all. Research on bounded generalized reciprocity (Balliet et al., 2014; Yamagishi & Kiyonari, 2000) suggests that much of human cooperation and generosity is driven by implicit reputational concerns and the principle of indirect reciprocity. That is, people are most likely to be pro-social specifically when they believe it increases the chances that others will respond with generosity in the future (Balliet & Van Lange, 2013; Balliet et al., 2014).

There is recent evidence that people's concerns about reciprocity may account for the link between adversity and pro-social outcomes. Specifically, adversity is associated with increased feelings of guilt, perhaps in response to the support and assistance one has received, and guilt, in turn, accounts for much of the association between adversity and prosociality (Lim & DeSteno, 2023). But expectations of future reciprocity might matter as well. People are more likely to repay their debt to others (including society at large) if they believe it will matter in future interactions (Balliet et al., 2014). What do people rely on when forecasting people's future reciprocity? One answer is beliefs about the *benevolence* of others (Janoff-Bulman, 1992). There are substantial individual differences in perceptions of others' goodness and trustworthiness (Kawachi et al., 1997; Mayer & Davis, 1999; Yamagishi, 2001; Yamagishi & Yamagishi, 1994).

Benevolence beliefs take the form of agreement with statements such as "People are basically kind and helpful" and "Human nature is basically good," so are highly relevant to future expectations of others' pro-social behavior. These beliefs differ among individuals and are surprisingly stable even in the context of adversity (e.g., Hafer & Rubel, 2015; Jost et al., 2015; Poulin & Silver, 2019; Pyszczynski et al., 2015). As a result, when adversity strikes, those with greater beliefs in the benevolence of others may be more motivated to subsequently engage in prosociality than would people who tend to believe that other people are selfish or unkind (see Figure 1 for a

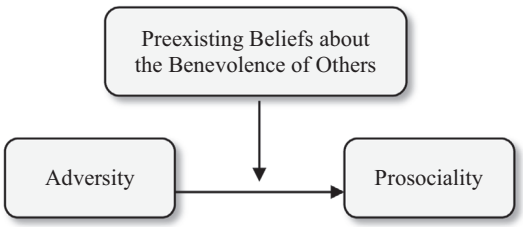

FIGURE 1 We predict that preexisting beliefs about the benevolence of others may moderate the positive association between adversity and prosociality.

conceptualization of the model we are testing). This prediction has not been examined in previous research.

1.3 | The present research

The present research examined the role of adversity in predicting pro-social outcomes such as empathy and helping behavior, as well as the moderation of these associations by benevolence beliefs. We construed prosociality to include types of other-directed behavior that are important in different domains, from close relationships to addressing the needs of strangers. Accordingly, we measured pro-social emotions, everyday acts of kindness, charitable giving, and formal volunteering. These relationships were tested both cross-sectionally (Study 1) and longitudinally (Study 2).

In Study 1, we analyzed data from a cross-sectional study to test the roles of negative life events and benevolence beliefs in predicting levels of empathic concern, self-reported altruism, and helping behavior. In Study 2, we analyzed data from a longitudinal study of a nationally representative U.S. sample. Study 2 first measured benevolence beliefs, and in following years, new negative life events and subsequent charitable giving and volunteering. The longitudinal design allowed us to examine whether preexisting benevolence beliefs strengthen the relationship between future negative life events and pro-social behavior.

2 | STUDY 1

2.1 | Method

The two studies reported here were not preregistered, but all materials, data, and analysis codes for both studies are available at: https://osf.io/em5r4/?view_only=7523250aca4b45b09e4b3b41f6a3a5de.

2.1.1 | Participants and procedure

As this is an exploratory study, we have no prior literature to guide our power analysis for a predetermined sample size. Therefore, we tried to recruit as many participants as possible with the available resources. Participants ($N = 359$) were recruited to take an online survey via Amazon's Mechanical Turk (MTurk) service. Our survey was restricted to Mturk workers who were based in the United States. Additionally, only workers with a 95% approval rating on all submitted tasks, plus a history of at least 500 completed tasks, were given access to the survey. Respondents were 62.5% female and the mean age was 33.86 ($SD = 1.71$, range = 18–74), resembling prior research with MTurk participants (Ipeirotis, 2010). The racial breakdown of the sample was 82.5% European-American, 6.8% African-American, 4.1% Asian-American, and 6.6% Other/More than one race. In addition, 5.1% of the sample identified their ethnicity as Hispanic. At the end of the survey, participants were debriefed and received $1 in compensation. All study protocols were reviewed and approved by the Institutional Review Board at University at Buffalo.

2.1.2 | Measures

Exposure to adversity

Exposure to negative life events was assessed using a checklist of negative events (e.g., serious illness or injury, natural disaster) experienced in the past 12 months (for a full list of items, see supplemental materials). The 12-month time frame was chosen based on prior research using this measure (e.g., Blum et al., 2014; Lim & DeSteno, 2016; Seery et al., 2010). This measure was modified from the Diagnostic Interview Schedule section on trauma (Robins et al., 1981) and based on research on trauma in a diverse sample (Holman et al., 2000; for additional information, see Silver et al., 2002.

The adversity measure consisted of summing the total number of events experienced. We decided to combine across all types of events, as previous studies that utilized this measure have found that most domains of adversity predicted prosociality (Lim & DeSteno, 2016, 2020).

Benevolence beliefs

Perceived benevolence of humanity, in general, was assessed using a shortened form of the benevolence subscale of Janoff-Bulman's (1989) World Assumptions Scale.[1] This scale consists of six items (e.g., "People are basically kind and helpful," "Human nature is basically good"; 1 = "Strongly disagree," 5 = "Strongly agree"). The mean of these items was used as an index of benevolence beliefs, with higher scores indicating greater beliefs in the benevolence of the world. The index exhibited good internal consistency ($\alpha = 0.87$).

Empathic concern

Empathic concern was measured using the seven-item empathic concern subscale of the Interpersonal Reactivity Index (IRI; Davis, 1980) (e.g., "I often have tender, concerned feelings for people less fortunate than me;" "When I see someone being taken advantage of, I feel kind of protective towards them;" $\alpha = 0.87$). Higher scores indicated greater dispositional empathic concern.

Self-reported altruism

To assess the level of altruistic tendencies in our respondents, we utilized the Self-report Altruism Scale (Rushton

et al., 1981). This was a 20-item questionnaire that utilized a 5-point Likert-type scale (1 = never; 2 = once; 3 = more than once; 4 = often; 5 = very often) which measured the frequency of altruistic behaviors in which participants may have engaged during the past 12 months (e.g., "I have done volunteer work for a charity", "I have donated blood", and "I have given money to charity"; $\alpha = 0.93$).

Volunteering

Respondents' level of involvement in helping others was assessed with a question that required them to state the amount of volunteer work they had done in the past 12 months on a 0 to 4 scale (0 = "None"; 1 = "1–50 hr"; 2 = "51–100 hr"; 3 = "101–200 hr"; 4 = "More than 200 hr") in a fashion parallel to the assessment of volunteering in the Health and Retirement Study (see Sonnega et al., 2014). While this measure is subject to critique, specifically about the accuracy of participants' recall, we included it in order to make our results relevant to the large literature on predictors and outcomes of volunteering that relies on this measure (e.g., Han et al., 2023; Infurna et al., 2016; Mike et al., 2014).

2.2 | Results

Three sets of separate multiple regressions examined adversity and benevolence beliefs as predictors of (1) empathic concern, (2) self-reported altruism, and (3) volunteering. We first examined the main effects of adversity and benevolence to examine their product-term interaction.

Levels of volunteering were highly skewed, with over one-quarter of the sample (26%) reporting no volunteering (see descriptive statistics and correlations in Table 1). Examining a normality plot of the residuals also indicated this variable was skewed. Therefore, the volunteering variable was analyzed using multiple logistic regression, testing the effect of each *level* of volunteering against no volunteering. All analyses were conducted using Stata 14 software (StataCorp, 2015; College Station, TX).

First, separate regressions were conducted to predict each measure of pro-social behavior from adversity and benevolence beliefs to examine their independent main effects. Results indicated that the amount of adversity predicted greater levels of volunteering, with those higher in adversity more likely to volunteer 51–100 hr ($b = 0.13$, 95% CI [0.06, 0.19], $p < 0.001$, RRR = 1.14), or 101–200 hr ($b = 0.15$, 95% CI [0.03, 0.27], $p = 0.014$, RRR = 1.16), versus none. There were no effects for 1–50 hr ($b = 0.03$, 95% CI [−0.02, 0.07], $p = 0.23$, RRR = 1.03), or More than 200 hr ($b = 0.09$, 95% CI [−0.06, 0.25], $p = 0.23$, RRR = 1.10), versus none.

In addition, adversity predicted greater self-reported altruism ($b = 0.62$, 95% CI [0.38, 0.87], $p < 0.001$, $f^2 = 0.06$) and empathic concern ($b = 0.11$, 95% CI [0.01, 0.20], $p = 0.03$, $f^2 = 0.01$). While we did not have hypotheses about main effects of benevolence beliefs, we examined these as well. Benevolence beliefs did not predict levels of volunteering (all $ps > 0.13$) but higher benevolence beliefs did predict self-reported altruism ($b = 3.08$, 95% CI [1.07, 5.09], $p = 0.006$, $f^2 = 0.02$), and empathic concern ($b = 1.91$, 95% CI [1.13, 2.70], $p < 0.001$, $f^2 = 0.06$).

Next, the interaction term between benevolence beliefs and adversity was entered into each of the above models to test for moderation of the adversity-prosociality association by benevolence beliefs. Results indicated no significant interactions for volunteering (all $ps > 0.24$), but significant interactions for self-reported altruism ($b = 0.60$, 95% CI [0.21, 0.99], $p = 0.003$, $f^2 = 0.02$) and for empathic concern ($b = 0.15$, 95% CI [0.002, 0.31], $p = 0.048$, $f^2 = 0.01$).

However, because significant interactions can sometimes serve as proxies for quadratic effects, we also tested the quadratic effects of adversity. There were no significant quadratic effects of adversity predicting volunteering. However, there was a significant quadratic effect for adversity predicting empathic concern ($b = -0.02$, 95% CI [−0.03, −0.01], $p = 0.001$, $f^2 = 0.02$), alongside which the benevolence X adversity interaction was no longer significant ($p = 0.12$). Therefore, we did not proceed to explore this interaction in predicting empathic concern. Finally, there was no significant quadratic effect of adversity predicting self-reported altruism ($ps > 0.38$), thus we proceeded to examine the interaction of benevolence beliefs and adversity predicting altruism.

TABLE 1 Study 1: Descriptive statistics and correlations for study variables ($N = 359$).

		Correlations		
	***M* (*SD*)**	**Empathic concern**	**Self-reported altruism**	**Volunteering**
Empathic concern	19.68 (5.59)	–	–	–
Self-reported altruism	29.95 (14.58)	0.18***	–	–
Volunteering	0.54 (0.62)	0.03	0.47***	–
Benevolence beliefs	3.38 (0.73)	0.25***	0.14**	0.10

**$p < 0.01$; ***$p < 0.001$.

To examine the nature of the interaction of benevolence and adversity in predicting self-reported altruism, simple slopes for the association between adversity and self-reported altruism were examined at low (M − 1 SD) and high (M+1 SD) levels of benevolence beliefs (see Figure 2). These analyses revealed that, at low levels of benevolence, there was no significant association between adversity and altruism (b=0.20, 95% CI [−0.17, 0.57], p=0.30, f^2<0.01) At high levels of benevolence, there was a significant positive association between adversity and altruism (b=1.07, 95% CI [0.69, 1.44], p<0.001, f^2=0.08). Notably, the interaction of benevolence and adversity predicting self-reported altruism was robust even when controlling for both empathic concern and volunteering (p=0.003).

2.3 | Discussion

The results of Study 1 supported the hypothesis that adversity in the form of greater numbers of negative life events would predict increased prosociality in the form of volunteering and empathic concern. We also found partial support for the prediction that adversity is most strongly associated with prosociality among those with high benevolence beliefs. These findings could mean that adversity predicts prosociality specifically when others are perceived as worthy or generous themselves, potentially allowing one to benefit from direct or indirect reciprocity. This explanation is consistent with the fact that we found significant effects for a self-report measure of pro-social behavior—that is, self-reported altruism—but not of pro-social emotion—that is, empathic concern. However, other explanations for this finding are possible. For example, perhaps adversity simply motivates people to seek out social contact, and benevolence beliefs bear on the perceived acceptance of others. Without a measure of more general social motivation, Study 1 provides no way to test this explanation. Alternately, benevolence beliefs could serve as a proxy for a person's preexisting moral identity (Aquino & Reed, 2002) or pro-social values (Balliet et al., 2009), which a person could become more motivated to act on following adversity. Without any other indicator of prior pro-social tendencies, Study 1 did not allow for a way to address this either.

Other notable limitations of Study 1 made it less than ideal for testing the hypothesized role of benevolence beliefs. First, this study lacked a pre-adversity measure of benevolence beliefs, which would help strengthen our claim that benevolence beliefs promote prosociality, rather than vice versa. In addition, our results were obtained using a relatively small sample for the purpose of examining interactions using two assessed variables; in fact, for the observed effect size with volunteering as the DV (f^2=0.01), we calculated using G*Power that we ideally would need a sample of N=787 to achieve 80% power. Study 2 addressed the aforementioned limitations with a longitudinal design, using an existing data set. These data included a measure of social contact besides helping behavior, a measure of agreeableness to assess pre-adversity pro-social tendencies (Habashi et al., 2016), and a much larger sample to detect interactions.

3 | STUDY 2

3.1 | Method

3.1.1 | Participants and procedure

Surveys were administered annually, for 3 years, to a cohort of individuals who were part of a panel recruited and maintained by Knowledge Networks, Inc. (KN),

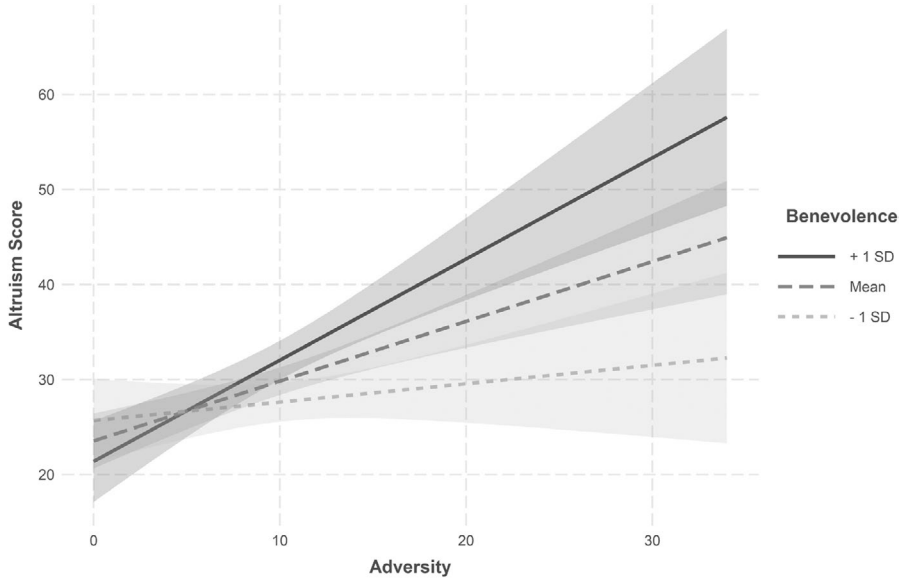

FIGURE 2 Study 1: Associations between adversity and self-reported altruism as a function of benevolence beliefs at +1 SD (0.73) above and −1 SD below the mean (3.38). Shaded areas in the graph represent the 95% confidence interval bands of their respective slopes.

a Web-based survey research company. KN recruited this panel in the early-mid 2000s using traditional probability methods via stratified "random digit dial" (RDD) telephone sampling. The cohort available for this study had been on the KN panel for <6 months and were aged 18 years and older. As compensation for completing each wave of the survey, KN panel members were given 5000 points ($5 USD).

Participants in the present study completed Wave 1 between December 28, 2006, and January 18, 2007; in total, 2142 panelists were invited to participate, which represented the maximum *N* possible under the researchers' budget, and 1613 individuals completed this initial survey (a 75.3% participation rate). All of these participants were invited to complete two subsequent surveys. Wave 2 surveys were administered between December 28, 2007, and February 19, 2008, and were completed by 1157 panelists (a 71.7% retention rate from the initial survey and a 76.8% participation rate from eligible Wave 1 panelists), and this *N* constitutes the sample for Study 2. Wave 3 surveys were administered between December 31, 2008, and February 9, 2009. A total of 975 panelists completed the final survey (a 72.0% participation rate). Certain analyses for Study 2 required participants who completed Waves 1, 2, and 3, yielding an *n* for those analyses of 855. All procedures were reviewed and approved by the Institutional Review Board at University of California, Irving.

3.1.2 | Measures

Exposure to adversity

Exposure to negative life events was measured using the same checklist as in Study 1, but assessed both as *lifetime adversity* (at Wave 1) and as events experienced since Wave 1—that is, in the previous 12 months (at Wave 2). These past-year events were summed up as a measure of *recent adversity* in order to examine the role of recent adversity in predicting change in pro-social behavior from Wave 1 to Wave 2.

Benevolence beliefs

Perceived benevolence of the world was assessed at Wave 1 using the same scale as in Study 1. The mean of these items was used as a measure of benevolence beliefs, and exhibited good internal consistency ($\alpha = 0.85$).

Volunteering hours

At Waves 2 and 3, respondents reported how much time they had spent volunteering in the past year (i.e., since Waves 1 and 2, respectively) in response to the following item: "In the past 12 months, about how much time, if any, have you spent doing volunteer work for religious, educational, health-related or other charitable organizations?" (0 = "None", 1 = "1–50 hr", 2 = "51–100 hr", 3 = "101–200 hr", 4 = "More than 200 hr").

Charitable involvement

At both Wave 1 and Wave 2, respondents were asked whether they had engaged in the following activities during the past 12 months: donating blood, giving money to or working for a charity, attending parent-teacher-association meetings,[2] or attending community group meetings. The total number of activities a participant had engaged (0–4) in was used as a measure of involvement in charity, with higher numbers indicating greater involvement.

Social groups

At Wave 2 we also examined the number of social groups (0–8) in which individuals had participated in the past 12 months (e.g., school club, sports team, neighborhood association).

Agreeableness

At Wave 1, participants completed the Ten-Item Personality Inventory, including two items consisting of paired words ("critical, quarrelsome" [reverse-scored] and "sympathetic, warm") to assess agreeableness (Gosling et al., 2003).

3.2 | Results

Two sets of multiple regressions were used to examine adversity and benevolence beliefs as predictors of (1) volunteering and (2) charitable giving. As in Study 1, we first examined main effects of adversity and benevolence beliefs before examining their product-term interaction.

Levels of volunteering were again highly skewed, with nearly half of the sample (45%) reporting no volunteering (see descriptive statistics and correlations in Table 2). A normality plot of the residuals also indicated skewness. Therefore, the volunteering variable was examined using multiple logistic regression comparing each level of volunteering against no volunteering, as in Study 1.

3.2.1 | Recent adversity

Unlike Study 1, Study 2 provided the opportunity to examine interactions between recent adversity and benevolence beliefs assessed *before* the occurrence of those adverse events. Recent adversity and pre-adversity benevolence beliefs were entered simultaneously to examine

TABLE 2 Study 2: Descriptive statistics and correlations for study variables ($N = 1157$).

	M (*SD*)	Range	Correlations	
			Charity	Volunteering
Charitable involvement	1.13 (0.89)	0–4	–	–
Volunteering	0.88 (1.09)	1–5	0.38***	–
Benevolence beliefs	3.62 (0.78)	1–5	0.16***	0.12***

***$p < 0.001$.

their independent main effects in predicting volunteering and charitable involvement.

Results indicated that the amount of prior year adversity predicted volunteering 51–100 hr, versus none, ($b = 0.13$, 95% CI [0.05, 0.21], $p = 0.002$, RRR = 1.14). No other volunteering contrasts were significant (*p*s > 0.13), and adversity was only a marginal predictor of charitable involvement ($b = 0.02$, 95% CI [−0.003, 0.05], $p = 0.09$, $f^2 < 0.01$).

Pre-adversity benevolence beliefs significantly predicted higher levels of volunteering at each level compared to none: 1–50 hr ($b = 0.25$, 95% CI [0.09, 0.42], $p = 0.003$, RRR = 1.28), 51–100 hr ($b = 0.41$, 95% CI [0.14, 0.68], $p = 0.003$, RRR = 1.50), 101–200 hr ($b = 0.39$, 95% CI [0.01, 0.77], $p = 0.044$, RRR = 1.48), and more than 200 hr ($b = 0.47$, 95% CI [0.11, 0.84], $p = 0.012$, RRR = 1.61). Pre-adversity benevolence beliefs also predicted charitable behavior ($b = 0.19$, 95% CI [0.13, 0.26], $p < 0.001$, $f^2 = 0.02$).

Next, the interaction term between pre-adversity benevolence beliefs and recent adversity was entered into each of the above models to test whether benevolence beliefs moderated the adversity-prosociality association. Results indicated significant interactions predicting volunteering for 1–50 hr ($b = 0.18$, 95% CI [0.07, 0.28], $p = 0.001$, RRR = 1.15), 51–100 hr ($b = 0.23$, 95% CI [0.10, 0.37], $p = 0.001$, RRR = 1.20), and 101–200 hr ($b = 0.35$, 95% CI [0.11, 0.60], $p = 0.005$, RRR = 1.32) versus none. There was no significant interaction for more than 200 hr versus none ($b = -0.02$, 95% CI [−0.13, 0.09], $p = 0.76$, RRR = 0.99).

There was also a significant interaction predicting charitable involvement ($b = 0.04$, 95% CI [0.01, 0.06], $p = 0.009$, $f^2 = 0.01$). By contrast, there was no such interaction predicting participation in social groups ($b = 0.002$, 95% CI [−0.04, 0.04], $p = 0.93$, $f^2 < 0.01$). In addition, agreeableness did not moderate the association between adversity and volunteering (all *p*s < 0.19) or charity ($p = 0.73$), nor did any other Big Five trait (all *p*s > 0.13). There were no quadratic effects of recent adversity on either volunteering or charitable involvement (*p*s > 0.21).

To examine the nature of the benevolence-adversity interaction, simple slopes for the association between recent adversity and each of the dependent variables were examined at low ($M - 1$ *SD*) and high ($M + 1$ *SD*) levels of benevolence beliefs. These analyses revealed that, at low levels of pre-adversity benevolence beliefs, there were no significant associations between adversity and volunteering (*p*s > 0.12). At high levels of pre-adversity benevolence beliefs, there was a significant positive association between prior year adversity and volunteering at 1–50 hr ($b = 0.25$, 95% CI [0.12, 0.38], $p < 0.001$, RRR = 1.28), 51–100 hr ($b = 0.39$, 95% CI [0.23, 0.54], $p < 0.001$, RRR = 1.47), and 101–200 hr ($b = 0.31$, 95% CI [0.09, 0.52], $p = 0.005$, RRR = 1.36), versus none. Because of the relative consistency of this moderating effect across all but the very highest range of the volunteering variable, this effect is graphed as a continuous effect across the central range of the volunteering variable in Figure 3.

Similarly, at low levels of pre-adversity benevolence beliefs, there was no significant association between adversity and charitable involvement ($b = 0.004$, 95% CI [−0.02, 0.03], $p = 0.76$, $f^2 < 0.01$), while at high levels of pre-adversity benevolence beliefs, there was a significant positive association between adversity and charitable involvement ($b = 0.06$, 95% CI [0.02, 0.10], $p = 0.002$, $f^2 = 0.01$; see Figure 4).

Prospective analyses

In addition to providing the opportunity to investigate the role of pre-adversity benevolence beliefs, the longitudinal structure of Study 2 also made it possible to examine the role of benevolence beliefs and adversity in predicting *change* in pro-social outcomes, as an even more stringent test of plausible causality. Because charitable behavior had been assessed at Wave 1 as well as Wave 2, Wave 1 charity was added as a covariate to the model that examined the interaction term between pre-adversity benevolence beliefs and recent adversity. That is, to prospectively examine change in charity, we examined a model with Wave 2 charity as the outcome, with Wave 1 benevolence beliefs, Wave 2 adversity, and Wave 1 charity as predictors.

Volunteering, by contrast, was only assessed beginning at Wave 2. Therefore, to prospectively examine change in volunteering, we examined a model with Wave 3 volunteering as the DV and Wave 1 benevolence beliefs, Wave 2 adversity, and Wave 2 volunteering as predictors.

The results of these models indicated a significant interaction for charity ($b = 0.03$, 95% CI [0.01, 0.06],

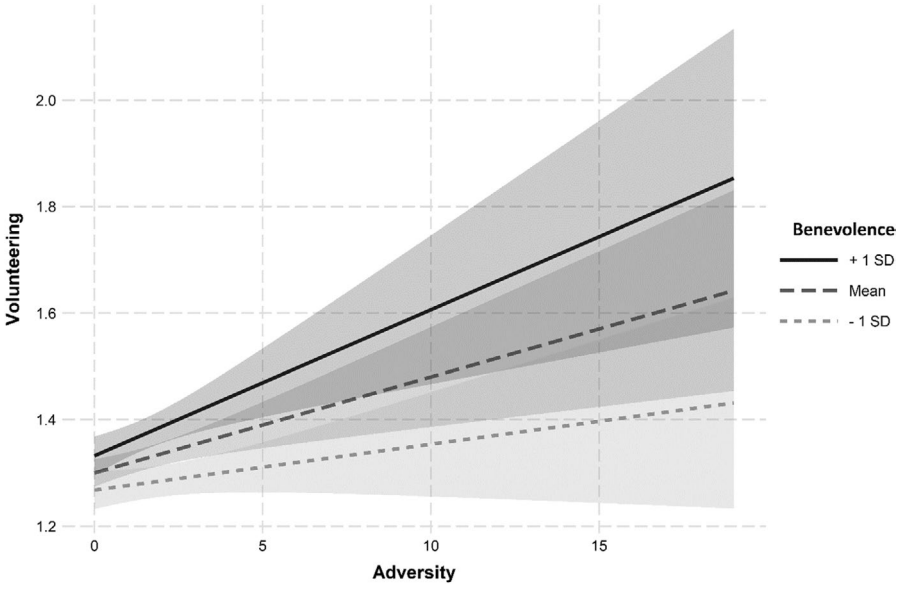

FIGURE 3 Study 2: Associations between recent adversity (between Wave 1 and Wave 2) and volunteering (Wave 2) as a function of benevolence beliefs at +1 SD (0.78) above and −1 SD below the mean (3.62). Shaded areas in the graph represent the 95% confidence interval bands of their respective slopes.

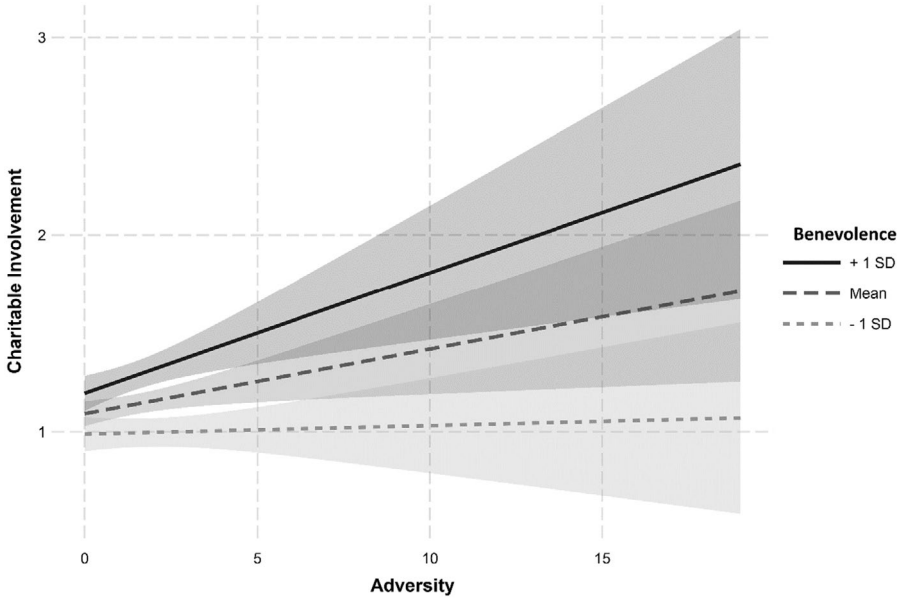

FIGURE 4 Study 2: Associations between recent adversity (between Wave 1 and Wave 2) and charitable involvement (Wave 2) as a function of benevolence beliefs at +1 SD above and −1 SD below the mean. Shaded areas in the graph represent the 95% confidence interval bands of their respective slopes.

$p = 0.008$, $f^2 = 0.01$) and non-significant interactions for volunteering ($ps > 0.20$) except at more than 200 hr versus none ($b = 0.41$, 95% CI [0.10, 0.71], $p = 0.008$, RRR = 1.50). Specifically, at low levels of pre-adversity benevolence beliefs, there was no significant association between adversity and change in charitable involvement ($b = -0.02$, 95% CI [−0.04, 0.01], $p = 0.15$, $f^2 < 0.01$). At high ($M = 1$ *SD*) levels of pre-adversity benevolence beliefs, adversity also did not significantly predict increased charitable involvement ($b = 0.03$, 95% CI [−0.001, 0.07], $p = 0.056$, $f^2 = 0.01$), but the significance of the interaction term implies that at higher levels of benevolence beliefs, this effect would become significant. In order to probe this without relying on outlying values, we conducted a Johnson-Neyman test (Johnson & Fay, 1950) to empirically discover the values of benevolence beliefs at which adversity significantly predicted charitable involvement. This analysis revealed that at values of benevolence beliefs 1.10 *SD* (or greater) above the mean, which would characterize more than the top 10% of our sample, adversity did significantly predict increased charitable involvement ($b = 0.04$, 95% CI [0.002, 0.07], $p = 0.049$, $f^2 = 0.01$). In addition, at values of benevolence beliefs 1.45 *SD* (or lower) than the mean, adversity actually predicted significantly *reduced* charitable involvement ($b = -0.03$, 95% CI [−0.06, 0.0001], $p = 0.050$, $f^2 = 0.01$). The full Johnson-Neyman output for this analysis is available at: https://osf.io/em5r4/?view_only=7523250aca4b45b09e4b3b41f6a3a5de.

As for the highest category of volunteering, at low levels of pre-adversity benevolence beliefs, adversity actually predicted a decrease in volunteering more than 200 hr ($b = -0.71$, 95% CI [−1.32, −0.10], $p = 0.023$, RRR = 0.49),

while at high levels of pre-adversity benevolence beliefs, adversity predicted no change in volunteering more than 200 hr ($b = 0.11$, 95% CI [−0.19, 0.40], $p = 0.47$, RRR = 1.12).

3.3 | Discussion

Study 2 improved upon a number of the limitations of Study 1. In particular, a longitudinal design assessed benevolence beliefs *prior* to the experience of adversity. The longitudinal results from Study 2 were broadly consistent with our hypothesis: recent adversity predicted increased prosociality in the forms of both volunteering and charitable behavior, specifically among those with high pre-adversity benevolence beliefs. These trends were partially replicated when analyses examined *change* across waves in volunteering and charitable behavior, which we regard as a particularly stringent test due to the relatively long time between assessments. The interaction pattern predicting more than 200 hr of volunteering suggests a protective role of benevolence beliefs on pro-social behavior: adversity predicted a decline in high-level volunteering among those low in pre-adversity benevolence beliefs, but there was no such adversity-related decline among those high in pre-adversity benevolence beliefs.

By contrast, adversity did not interact with benevolence beliefs to predict general participation in social groups. This suggests that adversity and benevolence do not merely predict increased social interactions. It is also noteworthy that benevolence beliefs moderated the association between adversity and prosociality but agreeableness and other Big Five personality traits did not. In sum, these findings are consistent with the possibility that adversity impacts prosociality strongest among those with more (rather than less) favorable views of the benevolence of others.

4 | GENERAL DISCUSSION

Two separate studies tested the prediction that adversity in the form of more frequent exposure to negative events would predict increased levels of prosociality, specifically among individuals with more favorable beliefs about the benevolence of other people. Study 1, using a cross-sectional design, provided partial evidence for this hypothesis for self-reported altruism. Moreover, the main effects from Study 1 suggest that the frequency of adversity experienced over a shorter time frame can predict prosociality (i.e., volunteering, self-reported altruism, and empathic concern). This finding adds new understanding to existing work, as previous studies mainly focused on the severity of adversity as a predictor of prosociality (Lim & DeSteno, 2016, 2020, 2023). Study 2, using a longitudinal design and a larger sample, found that pre-adversity benevolence beliefs moderated the association between adversity and pro-social action. These findings may suggest that adversity promotes prosociality specifically when others are perceived as more deserving or likely to behave prosocially themselves.

4.1 | Benevolence beliefs and adversity

Our findings are in line with past research that emphasizes expectations of direct and indirect reciprocity as motivators of helping behavior, (e.g., Balliet & Van Lange, 2013; Balliet et al., 2014; Yamagishi & Kiyonari, 2000). That is, people are most likely to be pro-social following adversity when they believe others are benevolent, which may indicate that people are sensitive to the possibility that their own good deeds will be repaid or at least paid forward in ways that could ultimately benefit them. The core of this hypothesis is that acting prosocially has the potential benefit of enhancing one's reputation in the eyes of one's social circles, thereby making one more likely to receive aid or support in the future (Aaldering et al., 2018; DeSteno, 2015; Fudenberg et al., 2012; Rand et al., 2015; Yamagishi et al., 1999).

While our findings were specifically about individual differences in beliefs about the benevolence of others (Kawachi et al., 1997; Mayer & Davis, 1999; Yamagishi, 2001; Yamagishi & Yamagishi, 1994), conceptually we would expect that situational variation would have much the same effect. That is, to the extent that societies or regions vary in levels of trust or benevolence beliefs, adversity might have different effects on prosociality across those contexts. This is an intriguing direction for further research.

As we have noted, negative life events can challenge one's benevolence beliefs (e.g., Janoff-Bulman, 1992; Kauffman, 2013; McCann & Pearlman, 1990; Park & Folkman, 1997; Poulin & Silver, 2019; Tedeschi & Calhoun, 2004), but people can also be motivated to defend their worldviews (e.g., Hafer & Rubel, 2015). As such, preexisting benevolence beliefs could shape people's interpretations of newly experienced adversity and motivate post-adversity behaviors, including prosociality. Our findings provide evidence for this prediction, particularly in that our longitudinal (Study 2) results indicated that only people with more, rather than less, favorable views of the benevolence of the world responded to subsequent adversity with increased prosociality.

It is important to note that there are alternate explanations for the role of benevolence beliefs in the adversity-prosociality association. For example, it is possible that those higher in benevolence beliefs are just more motivated to affiliate with others, perhaps out of a desire for emotional

support, and that engaging in pro-social behavior is just one manifestation of this. However, this interpretation is not supported by our finding that benevolence beliefs do not moderate the association between adversity and general social participation. Alternately, benevolence beliefs might stand in for preexisting pro-social motivations, which become prioritized following adversity. However, our analyses testing pre-adversity agreeableness as a moderator was not consistent with this hypothesis. By contrast, there are other possible explanations that are more consistent with our data. For example, it is possible that during a time of adversity, those higher in benevolence beliefs interpret the motivations of benefactors more favorably, leading to greater gratitude and wanting to "give back" in the form of pro-social behavior (cf. Bartlett & DeSteno, 2006). Further research should examine such possible competing mechanisms.

4.2 | Limitations and future directions

We acknowledge some limitations of the present studies that could be addressed in future research. First, future studies could use more comprehensive measures of adversity and pro-social behavior. Our measure of adversity as the cumulative number of negative life events over a 12-month period did not include a measure of severity, which could provide additional insights into the role of adversity in prosociality (cf. Lim & DeSteno, 2016). Examining adversity over other time scales, from acute stress (cf. Nitschke et al., 2022) to multiple years following adversity, could yield different patterns of effects. In addition, our measures of pro-social behavior included only self-reported number of charitable behaviors or hours spent volunteering over the past year. The latter measure, in particular, is subject to critique because it raises questions about the accuracy of participants' recall. However, the use of large ranges (e.g., 51–100 hr) mitigates this issue to some degree, as noted by many others who have used this measure to assess volunteering (e.g., Han et al., 2023; Infurna et al., 2016; Mike et al., 2014). Nonetheless, more comprehensive measures could provide a stronger test of our hypotheses.

Second, we did not have a way to test plausible mechanisms for the proposed role of benevolence beliefs, including perceptions of others' generosity, or expectations of direct and indirect reciprocity. Further, it is important to note that from these correlational studies, we cannot conclude that adversity *caused* increased pro-social behavior, as we hypothesize. Our analyses that examined *change* in pro-social outcomes also provided inconsistent support for our hypotheses; benevolence beliefs only predicted differences in the relation between adversity and change in charitable behavior. Experimental methods such as having people reflect on times of adversity in their lives could provide firmer support for adversity's causal role. We also acknowledge that some of the effect sizes of interest were small. We suspect that an experimental recall paradigm of adversity or the use of a different well-established measure of adversity might provide more robust effects in future studies. We hope that the present analyses provide a generative starting point for these and other approaches, to foster a better understanding of whether, when, and how one's own suffering leads to kindness to others.

5 | CONCLUSION

Overall, our findings suggest that belief in the benevolence of others might be an important moderating factor that facilitates prosociality in the face of adversity. This has important implications as past work has highlighted the importance of prosociality in communities affected by natural disasters (Drury, 2018; Zaki, 2020), and among individuals with posttraumatic stress as a promoter of resilience and healing (Kishon-Barash et al., 1999; Xu et al., 2024).

AUTHOR CONTIBUTIONS

Daniel Lim: Conceptualization, methodology, data analyses, visualization, writing, reviewing and editing of the manuscript; Michael J. Poulin: Writing of manuscript, original draft preparation, data analyses, conceptualization, methodology, data management, reviewing and editing; C. Dale Shaffer-Morrison and Laurent M. Ministero: Conceptualization, writing, reviewing, and editing; Roxane Cohen Silver: methodology, conceptualization, reviewing, and editing.

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CONFLICT OF INTEREST STATEMENT

None.

ETHICS STATEMENT

All studies were conducted in accordance with the Ethical Standards of the American Psychological Association. All studies were approved by their respective Institutional Review Boards.

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ENDNOTES

[1] The full subscale consisted of eight items assessing benevolence of the world (potentially including people) and benevolence of people, specifically; this was shortened in a prior investigation to just include the six items that correlated most strongly with the overall scale mean (Poulin & Silver, 2008).

[2] Because PTA meeting attendance can arguably be more about socializing than being prosocial, per se, we also conducted analyses with the charitable involvement variable that omitted this category. When using this more-targeted involvement variable, there was no significant main effect for the association between recent adversity and charitable involvement ($p = 0.27$), but the benevolence-recent adversity interaction remained significant ($p = 0.02$).

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