


ARTICLE

# Beliefs, observability and donation revision in charitable giving: evidence from an online experiment

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## Abstract

This study examines how beliefs interact with heterogeneous donation preferences in determining people's donation decisions and choices of revision and observability. We conducted an online experiment eliciting participants' first-order beliefs, that is, beliefs about an average donor's contribution, with the opportunity of being recognized. We also provided the opportunity for donation revision to a group of randomly selected participants. Our study results show that people's first-order beliefs are positively correlated with their willingness to donate and their actual donations. Moreover, first-order beliefs also interact with people's heterogeneous donation preferences in jointly determining their decisions of donation revision and observability – their tendency to opt in for public recognition. Donors with low first-order beliefs and high donation preferences are most likely to opt in for recognition, but they are unlikely to revise their donations. Donors with high first-order beliefs and low donation preferences are most likely to revise their donations, but they are less likely to choose to be recognized. Donors with low first-order beliefs and low donation preferences display the lowest tendency toward revision and observability.

**Keywords:** charitable giving; public recognition; first-order belief; revision; social norm

## Introduction

Social norms, the commonly accepted and expected patterns of attitudes, beliefs, behaviors and customs within a particular society or social group, serve as the foundation for prosocial behaviors by shaping the psychology that drives us to act for the benefit of others (Bicchieri, 2005; Bicchieri *et al.*, 2011; Boyd, 2018; Henrich and Muthukrishna, 2021; Boyd and Richerson, 2022). People respond to information and expectations in compliance with social norms (Frey and Meier, 2004; Fehr and Fischbacher, 2004b; Allcott, 2011; Bicchieri and Mercier, 2014; Bicchieri *et al.*,

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2020) and engage in third-party and higher-order punishment when others deviate from the social norms of cooperation (Henrich *et al.*, 2001; Gintis *et al.*, 2003; Fehr and Fischbacher, 2004a; Gintis *et al.*, 2008).

Social norms have been widely used to motivate contributions to public goods (Rand *et al.*, 2014; Bicchieri *et al.*, 2020; Prentice and Paluck, 2020; Constantino *et al.*, 2022; Williamson and Thulin, 2022). In the context of philanthropic giving, previous studies have demonstrated that individuals conform to established norms and adjust their donations to align with what is perceived as socially acceptable (Frey and Meier, 2004; Alpizar *et al.*, 2008; Jones and Linardi, 2014). For instance, Frey and Meier (2004) showed that donors modify their contributions based on the information regarding others' donations. Jones and Linardi (2014) observed that individuals tend to match their contributions to the group average and prefer not to stand out. Additionally, Alpizar *et al.* (2008) found that people's contributions cluster around the suggested contribution levels. They pointed out that the perceived social norm of giving serves as a reference point influencing individuals' donation decisions and the amount they contribute.

Beliefs play a significant role in norm-driven prosocial behaviors (e.g., Croson, 1999; 2000; Rutström and Wilcox, 2009; Chen *et al.*, 2020; Hensel *et al.*, 2022). For example, Croson (2000) found that individuals are more likely to reach the equilibrium outcome when they are asked to consider what others would do in a public goods contribution game. Chen *et al.* (2020) demonstrated that beliefs promote prosocial tendencies. Hensel *et al.* (2022) showed that both first-order beliefs (beliefs about what other people would do) and second-order beliefs (beliefs about other people's beliefs) positively influence individuals' adherence to containment measures during the COVID-19 pandemic, even when following these new social norms incurs costs at the individual level.

Regarding charitable giving, beliefs about other people's contributions are found to be consistently correlated to one's own contribution (Croson, 2007; Neugebauer *et al.*, 2009; Fischbacher and Gächter, 2010; Smith, 2013; Kocher *et al.*, 2015; Bicchieri *et al.*, 2022). Becchetti *et al.* (2017) conducted a study to examine the causal relationship between beliefs, social information and people's actual giving in a framed field experiment. Their study confirmed the pivotal role that beliefs play in influencing individual contributions. Additionally, Gee and Schreck (2018) found that beliefs about peers' donations significantly impact donation matching.

Moreover, beliefs interact with individuals' preferences in influencing prosocial behaviors, such as their preferences of donation and cooperation (Fischbacher and Gächter, 2010). For instance, beliefs can interact with people's propensity to cooperate (e.g. Fischbacher *et al.*, 2001; Croson *et al.*, 2005; Croson and Shang, 2008; Fischbacher and Gächter, 2010). Fischbacher and Gächter (2010) found that people contributed a weighted average of the predicted contribution and belief. Their study showed that a large portion of their participants were 'conditional cooperators', who reduced their contributions when they believed others were free riders but cooperated when they believed others were cooperators.

Observability is another crucial factor in determining compliance with social norms. Bicchieri *et al.* (2022) argued that social proximity to peers and the observation of peer behaviors strongly influence norm compliance. Their study demonstrated

that signaling social proximity is an effective approach to encourage and maintain adherence to social norms and prevent deviation from norm compliance. These findings align with previous research indicating that people tend to act more generously when being observed (Andreoni and Petrie, 2004; Soetevent, 2005; Alpizar *et al.*, 2008; Ariely *et al.*, 2009; Bekkers and Wiepking, 2011; Linardi and McConnell, 2011; Yoeli *et al.*, 2013; Karlan and McConnell, 2014).

One explanation for why individuals exhibit prosocial behaviors when being observed is that they aim to align with social norms to maintain and enhance their reputations (Andreoni and Bernheim, 2009; Akerlof, 1980; Bénabou and Tirole, 2006; Ellingsen and Johannesson, 2007, 2008). In situations where social norms are not readily observable, people tend to act in accordance with their perceptions of the social norms (Heinrichs *et al.*, 2006; Bursztyen *et al.*, 2020).

Our study resides at the crossroads of the aforementioned studies, including beliefs and their correlations with preference heterogeneity and observability, under the backdrop of philanthropy giving. This study answers the research question of how beliefs and heterogeneous donation preferences interact in jointly influencing participants' donation decisions and their choices of revision and observability.

To answer the above research questions, we conducted a lab-in-the-field (Levitt and List, 2009) fundraising experiment online using Amazon Mechanical Turk (MTurk) crowdsource workers and college students from a public university in the United States. We solicited participants' donations, gathered their first-order beliefs – what they think an average person would give and offered them the opportunity of recognition after making a donation. Furthermore, participants were randomly assigned to either a baseline group with no donation revision or a comparison group in which they had the chance to revise their donations.

This experimental design enables us to capture first-order beliefs, donation preferences and the tendency of donation revision in the presence of public recognition. We expect that individuals with low donation preferences will be more likely to revise their donations if they believe others will donate more, and individuals with high donation preferences will be more likely to choose to be recognized. Based on these rationales, we formulate the following hypotheses.

**Hypothesis 1.** Individuals with higher first-order beliefs are more likely to donate and contribute larger amounts.

**Hypothesis 2.** Individuals with higher first-order beliefs and low initial donations are more likely to revise their donations.

**Hypothesis 3.** Individuals with higher initial donations are more willing to be recognized. However, it remains unclear how first-order beliefs interact with initial donations in jointly determining people's preferences for recognition. Individuals may prefer increased visibility to demonstrate compliance with the social norm, or they may anticipate greater reputational returns if they stand out by deviating from the social norm.

Our results reveal a strong relationship between individuals' first-order beliefs regarding an average person's donation and their own contributions. This finding is consistent with the previous literature (e.g., Croson, 2007; Neugebauer *et al.*, 2009; Fischbacher and Gächter, 2010; Smith, 2013; Kocher *et al.*, 2015). First-order beliefs also influence participants' decisions to revise their donations and make their contributions visible. Furthermore, these beliefs interact with individuals'

heterogeneous donation preferences, as indicated by their initial donation amounts, in jointly determining their choices. Participants with high first-order beliefs and low initial donations are more inclined to revise their contributions. Conversely, those who donate more are more likely to opt for visibility, especially when they believe others are contributing less. This suggests that donors perceive reputation gains from being observed as most significant when others contribute less.

This study contributes to the existing literature on behavioral science and philanthropic giving by providing empirical evidence on how first-order beliefs interact with individuals' heterogeneous donation preferences in influencing people's donation decisions and choices of public recognition and donation revision. The results of this study offer practical insights for fundraising professionals in utilizing beliefs to elicit charitable giving and predict individual donation behaviors.

The remainder of this paper proceeds as follows: The next section presents the experiment design and procedure. Section 'Data Analysis and Results' provides the summary statistics and data analysis results. Section 'Discussions' discusses the implications and limitations of this study and offers recommendations for future research. Section 'Conclusions' concludes.

## Experiment design and procedure

We conducted an online experiment where participants first answered a survey questionnaire and earned an endowment. The Appendix presents this survey questionnaire. Upon completing the survey, participants were presented with the opportunity to donate to a charity, Médecins Sans Frontières (Doctors Without Borders), using their earned endowment. We introduced the mission, general projects and recent COVID-19 activities of Médecins Sans Frontières. We selected this nonprofit organization given its global service and non-affiliation with any political or religious groups.

We randomly assigned participants to either a baseline group or a comparison group. In the baseline group, participants first decided whether they would donate to the charity and, if yes, how much to donate. We also asked participants how much they thought an average donor like them would contribute. We made this question incentive-compatible by offering an extra \$0.5 if their guess was within \$0.1 of the most frequent amount contributed. We solicited their initial donation and their first-order belief of an average donor's contribution simultaneously to study the correlation, rather than examining the causal relationship between the two. We offered participants the chance of public recognition after they made their donations. They had the choice to opt in to receive donor recognition in the form of a public announcement via social media, or they could remain anonymous.

Participants of the comparison group received similar treatment as those in the baseline group, except that they were given an opportunity to revise their donation decisions at the same time when they decided whether they would like to be recognized or not. In other words, participants who initially chose not to donate were provided a second chance to contribute with the option to be recognized. Those who initially chose to contribute also had the opportunity to revise their donations, including the option to increase or decrease their initial donations, or to change their minds and not give. The experiment procedure can be found in the Appendix.

We conducted this experiment using two subject samples: Amazon Mechanical Turk (MTurk) crowdsource workers and students from a public university in the United States. We recruited 239 participants from MTurk and obtained 203 valid observations after excluding incomplete answers, answers from repeated IP addresses, and those failing the attention check questions. On average, MTurk participants spent 11 min on the survey and earned \$1 for their participation, plus a \$2 bonus for completing the survey. This translates to an effective hourly wage of \$16 per hour. We recruited 289 student participants and obtained 242 valid observations following the same data screening process. On average, student participants spent 14 min on the survey. We paid them \$1 for participation plus a \$4 bonus for completing the survey. This translates to an effective hourly wage of \$21. We paid MTurk participants a lower bonus commensurate with the average MTurk compensation (Hara *et al.*, 2018).

Participants kept their participation payment and made their contributions to Doctors Without Borders using their bonus only. Donations were completely voluntary. We recognized donors via social media and donated all the funds raised to Médecins Sans Frontières at the end of the experiment.

## Data analysis and results

Table 1 presents the descriptive statistics by sample source and treatment. Participants from MTurk are mostly college-educated white males with an average age of 37 years old. The student participants are mainly female undergraduates with an average age of 27, with slightly more than half non-whites. We also report participants' donation decisions in Table 1. We define *donation* as the average amount contributed by all participants in the final stage (i.e., after donation revision for those in the comparison group), including zero contributions. *Belief* is the perceived donation by an average participant. These three variables are reported both in dollar amounts and as percentages of the participant's total endowment. *Participation* is the percentage of donors who contributed out of all the participants. *Recognition* is the percentage of donors who choose to be recognized.

We observe that on average, students gave more than MTurk workers. An average MTurk worker gave \$0.58, or 28.82% of his total \$2 bonus, while an average student gave \$1.26, or 31.40% of her \$4 bonus. However, the difference between these percentages is statistically insignificant ( $p$ -value = 0.5137 for the unpaired two-tailed  $t$ -test).

The perceived average donation is higher among students compared to that of the MTurk workers. On average, the believed average donation of MTurk workers is \$0.67, or 33.51% of the total endowment, while these numbers are \$1.72, or 43.06% of the total endowment for students. The difference between these percentages of donation as a proportion of the total endowment is statistically significant at the 1% level ( $p$ -value < 0.01, unpaired  $t$ -test).

Regarding the donation participation rate, 51.72% of the MTurk workers contributed, compared to the value of 35.95% for students. The difference in participation between these two subject pools is statistically significant at the 1% level ( $p$ -value < 0.001, unpaired  $t$ -test). In addition, MTurk workers are more likely to opt in for recognition. 43.84% of the MTurk workers chose to be recognized, compared to

**Table 1.** Descriptive statistics

	Sample 1: MTurk workers ( <i>n</i> = 203)						Sample 2: students ( <i>n</i> = 242)					
	Baseline		Comparison		Total		Baseline		Comparison		Total	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std
<b>Personal characteristics</b>												
Age	37.02	10.41	36.85	9.81	36.94	10.09	26.21	9.44	27.68	10.62	26.95	10.05
Male (%)	58.42	0.50	70.59	0.46	64.53	0.48	26.67	0.44	27.05	0.45	26.86	0.44
White (%)	62.38	0.49	66.67	0.47	64.53	0.48	45.38	0.50	54.10	0.50	49.79	0.50
College/Undergraduate (%)	80.20	0.40	76.47	0.43	78.33	0.41	84.17	0.37	77.87	0.42	80.99	0.39
<b>Donation</b>												
Donation (\$)	0.56	0.79	0.60	0.72	0.58	0.75	1.21	1.80	1.30	1.78	1.26	1.78
Donation (%)	27.82	39.53	29.80	35.94	28.82	37.69	30.31	44.96	32.48	44.38	31.40	44.59
Belief (\$)	0.76	0.63	0.59	0.59	0.67	0.61	1.82	1.40	1.62	1.47	1.72	1.43
Belief (%)	37.82	31.45	29.29	29.49	33.51	30.70	45.42	34.90	40.56	36.87	43.06	35.87
Participation (%)	44.55	0.50	58.82	0.49	51.72	0.50	32.50	0.47	39.34	0.49	35.95	0.48
Recognition (%)	37.62	0.49	50.00	0.50	43.84	0.50	7.50	0.26	27.05	0.45	17.36	0.38
# of observations	101		102		203		120		122		242	

17.36% of the students who chose to be recognized. The difference between these two numbers is statistically significant at the 1% level as well ( $p$ -value < 0.001, unpaired  $t$ -test).

We perform regression analyses to complement the nonparametric analysis. We constructed the following probit regression model to analyze what factors influence subjects' participation decisions:

$$\text{Probit}(\text{participation}) = \beta_0 + \beta_1 * \text{Treatment} + \beta_2 * \text{Belief} + \beta_3 * \text{Personal characteristics} + \varepsilon \quad (1)$$

The dependent variable, *participation*, indicates the participants' decisions of whether to contribute to the charity or not. The value of this variable equals 1 if the participant gives any positive amount, and 0 otherwise. The independent variable, *treatment*, captures the treatment effect of allowing participants to revise their donations, which is the difference between the baseline group and the comparison group. This binary variable equals 0 for those in the baseline group and 1 for the comparison group. *Belief* is the perceived donation amount from an average person, measured as a percentage of the total endowment. We also control subjects' personal characteristics, including age, gender and race.  $\varepsilon$  is the error term. We ran Model (1) using MTurk workers, students and the pooled sample, respectively, and henceforth.

Table 2 presents the probit regression results. We observe that participants' perceived donation amount from an average person is positively correlated with their likelihood to donate. A 100% increase in the believed average donation is associated with 90.6–93.4% higher chances to give for MTurk workers in the model specifications with and without personal characteristics, respectively. Another way to interpret this result is that with each unit increase in the subject's first-order belief, the probability of the subject donating to the charity goes up by 0.906–0.034%. For students, a 100% increase in their believed average donation is correlated with a 76.9–97.1% higher likelihood to contribute to the model specifications with and without personal characteristics, respectively. In the pooled sample, a 100% increase in the believed average donation is correlated with 70.0–80.3% higher chances to donate in the model specifications with and without personal characteristics, respectively. All the above coefficients are significant at the 1% level.

Allowing people to revise their donations also increases their likelihood to give. MTurk workers in the comparison group are 44.8–56.2% more likely to give compared to their counterparts in the baseline group in the model specifications without and with personal characteristics, holding everything else equal. These coefficients are significant at the 5% and 1% levels, respectively. For students, these coefficients are 31.6–33.6% in the model specifications with and without personal characteristics, respectively. These coefficients are significant at the 10% level. In the pooled sample, participants are 38.3–39.7% more likely to donate when they have the option to revise their donations. Both of these coefficients are significant at the 1% level.

We constructed the following OLS regression model to further analyze how first-order beliefs and the opportunity of donation revision influence participants' actual donation. The dependent variable, *donation*, is the subject's actual donation as a

**Table 2.** Probit regression results ( $Y$ = participation, marginal effects reported)

Variables	MTurk workers		Students		Pooled sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Belief	0.934*** (0.310)	0.906*** (0.322)	0.971*** (0.257)	0.769*** (0.271)	0.803*** (0.191)	0.700*** (0.197)
Treatment	0.448** (0.184)	0.562*** (0.193)	0.336* (0.183)	0.316* (0.188)	0.383*** (0.128)	0.397*** (0.131)
Personal characteristics	No	Yes	No	Yes	No	Yes
Constant	-0.481*** (0.173)	-0.0402 (0.417)	-0.994*** (0.179)	-1.585*** (0.311)	-0.673*** (0.121)	-1.253*** (0.229)
Observations	202	201	210	205	412	406

Standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .



percentage of the total endowment. The independent variables are defined the same as in Model (1).  $\varepsilon$  is the robust standard error.

$$\begin{aligned} \text{Donation} = & \beta_0 + \beta_1 * \text{Belief} + \beta_2 * \text{Treatment} + \beta_3 * \text{Personal characteristics} \\ & + \varepsilon \end{aligned} \quad (2)$$

Table 3 reports the regression results of Model (2). Our results show that first-order beliefs have a significant positive influence on participants' donation in both model specifications with and without personal characteristics, and this is true across all samples. For MTurk workers, a 100% increase in their beliefs is associated with a 36.7–37.7% increase in the actual donation as a percentage of their endowment in the model specification with and without personal characteristics, respectively. For students, a 100% increase in their believed average donation is associated with a 32.4–39.0% increase in the actual donation in the model specification with and without personal characteristics, respectively. These numbers are 35.9–38.1 for the pooled sample, respectively. All the above coefficients are significant at the 1% level. We do not find revision has any significant impact on participants' donations except in the model specification controlling for personal characteristics with the pooled sample.

These findings above support our Hypothesis 1. People's beliefs of an average person's donation correlate with their decision of whether to donate or not and their actual donation amount.

Next, we present the moderation models to further investigate how people's beliefs about an average person's donation and their initial donations influence their decisions on donation revision and public recognition. We first build a probit model, Model (3), to analyze the determinants of the subject's choice of donation revision. The dependent variable, *revision*, is the binary choice of whether participants utilized the opportunity of donation revision or not. It equals 1 if the subject revised his or her donation and 0 otherwise. The independent variable, *initial donation*, is one's donation amount as a percentage of the total endowment before revision. The other independent variables are the same as defined in previous models. We added the interaction term between one's first-order belief and initial donation to test the moderating effect of beliefs.

$$\begin{aligned} \text{Probit (Revision)} = & \beta_0 + \beta_1 * \text{Belief} + \beta_2 * \text{Initial Donation} \\ & + \beta_3 * \text{Belief} * \text{Initial Donation} \\ & + \beta_4 * \text{Personal characteristics} + \varepsilon \end{aligned} \quad (3)$$

Table 4 presents the regression results for Model (3). We used the pooled sample only because there was a limited number of participants who revised their donations in the comparison group ( $n = 48$ ), including 36 participants of MTurk workers and 12 participants of students. We run the model specifications without and with personal characteristics, respectively. Our results show that first-order beliefs have a positive effect on one's choice of donation revision. The higher the believed donation is, the more likely the individual is to revise his donation. In addition, the interaction

**Table 3.** OLS regression results ( $Y = \text{donation}$ )

Variables	MTurk workers		Students		Pooled sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Belief	0.377*** (0.0868)	0.367*** (0.0880)	0.390*** (0.0855)	0.324*** (0.0883)	0.381*** (0.0615)	0.359*** (0.0622)
Treatment	0.0492 (0.0514)	0.0593 (0.0519)	0.0746 (0.0590)	0.0664 (0.0612)	0.0625 (0.0392)	0.0667* (0.0401)
Personal characteristics	No	Yes	No	Yes	No	Yes
Constant	0.138*** (0.0494)	0.294** (0.129)	0.103* (0.0569)	-0.0648 (0.0921)	0.121*** (0.0377)	0.0699 (0.0713)
Observations	202	201	210	205	412	406
<i>R</i> -squared	0.093	0.109	0.102	0.118	0.098	0.098

Robust standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

**Table 4.** Probit regression results ( $Y$  = revision, marginal effects reported)

Variables	(1)	(2)
	Revision	Revision
Belief	1.179*** (0.380)	1.153*** (0.390)
Initial donation	0.139 (0.504)	0.0142 (0.512)
Belief * initial donation	-1.382* (0.785)	-1.343* (0.794)
Personal characteristics	No	Yes
Constant	-1.020*** (0.166)	-1.579*** (0.372)
Observations	204	200

Standard errors in parentheses. \*\*\* $p < 0.01$ , \* $p < 0.1$ .

term between the believed donation and one's initial donation is negative and statistically significant at the 10% level. We use Figure 1 to visualize the interaction effect of belief and initial donation on one's revision decision and explain the moderating effect of first-order beliefs on people's choice of donation revision as their initial donation increases.

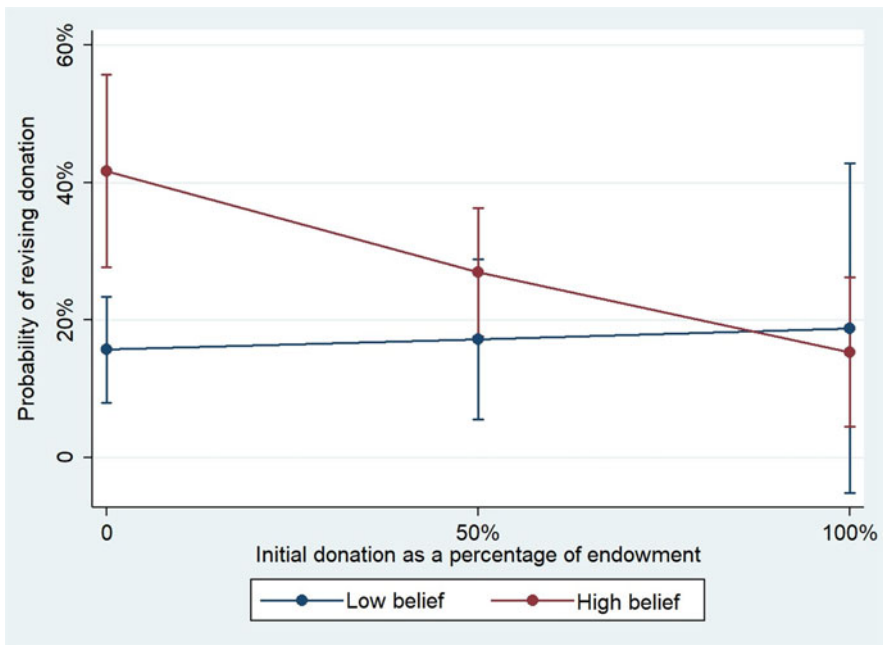
**Figure 1.** The influence of belief and initial donation on donation revision.

Figure 1 presents the probabilities of participants revising their donations using their first-order beliefs as the moderator. It shows that there is a significant difference in the likelihood of donation revision between those with a higher belief (represented by the red line), which is one standard deviation above the mean, and those with a lower belief (represented by the blue line), which is one standard deviation below the mean ( $\mu = 0.349$ ,  $\sigma = 0.338$ ).

We observe a significant negative relationship between participants' initial donation and their likelihood of revision for those with a higher first-order belief ( $p < 0.001$ ). The more they gave in the initial stage, the less likely they chose to revise their donations in the later stage. For those with a lower belief, there is a slight positive relationship between the initial donation and their choice of revision. Yet, this positive relationship is small in magnitude and statistically insignificant. In general, participants having higher beliefs were more likely to revise their donations compared to their counterparts with a lower believed average. Those who initially gave a lower amount but had a high level of beliefs were mostly likely to revise their donations in the presence of public recognition. On the contrary, donation revision was least effective for those with lower first-order beliefs.

Moreover, we build the following probit model, Model (5), to analyze subjects' choice of public recognition. The dependent variable, *recognition*, is the binary choice of whether participants opt in for public recognition or not. It equals 1 if the subject chose to be recognized and 0 otherwise. All the independent variables are defined the same as in Model (4).

$$\begin{aligned} \text{Probit}(\text{Recognition}) = & \beta_0 + \beta_1 * \text{Belief} + \beta_2 * \text{Initial Donation} \\ & + \beta_3 * \text{Belief} * \text{Initial Donation} \\ & + \beta_4 * \text{Personal characteristics} + \varepsilon \end{aligned} \quad (4)$$

Table 5 reports the regression results for Model (4). Our results show that beliefs have a positive effect on one's choice of recognition. The higher the belief is, the more likely the individual prefers to be recognized. These coefficients are statistically significant at the 1% level. People's initial donation also has a positive impact on the choice of recognition. These coefficients are all significant at the 1% level in both model specifications without and with personal characteristics. Additionally, the interaction term between one's first-order belief and initial donation is negative and statistically significant at the 5% level. We use Figure 2 to illustrate the moderating effect of first-order beliefs on people's choice of public recognition as their initial donation increases.

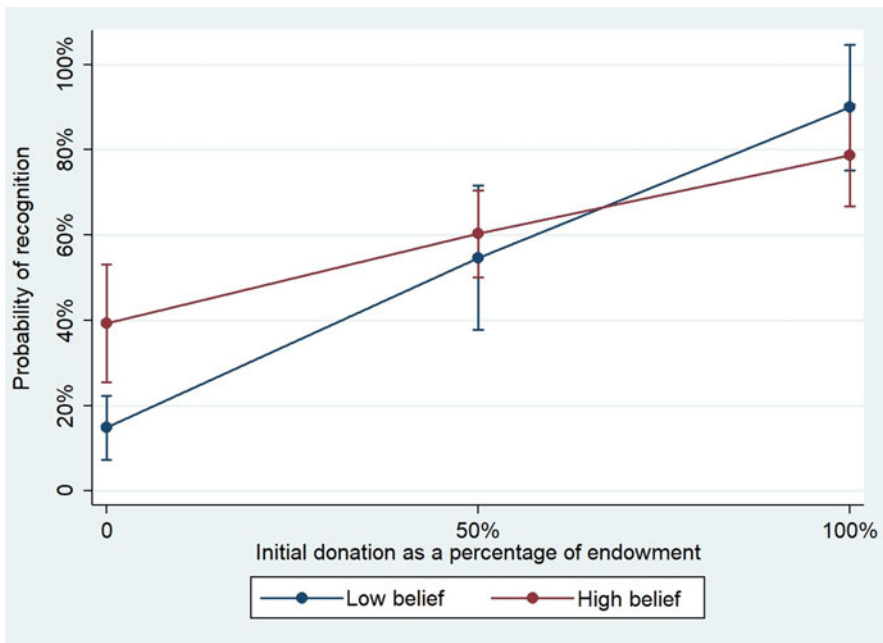
Figure 2 illustrates the probability of participants choosing public recognition in the same fashion as Figure 1, using first-order beliefs as the moderator. There is a significant difference in people's preference for public recognition between those with a higher belief (represented by the red line), which is one standard deviation above the mean, and those with a lower belief (represented by the blue line), which is one standard deviation below the mean. Although there is a positive relationship between one's initial donation and the likelihood of choosing to be recognized for both types of participants with various levels of beliefs, the marginal effect of

**Table 5.** Probit regression results ( $Y$  = recognition, marginal effects reported)

Variables	(1) Recognition	(2) Recognition
Belief	2.346*** (0.485)	2.294*** (0.496)
Initial donation	1.143*** (0.380)	1.100*** (0.387)
Belief * initial donation	-1.858** (0.740)	-1.840** (0.756)
Personal characteristics	No	Yes
Constant	-1.058*** (0.168)	-1.436*** (0.366)
Observations	204	200

Standard errors in parentheses. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

their initial donation on the choice of recognition is larger for the group with a lower belief compared to their counterparts with a higher belief. Additionally, these two lines cross at the point where participants gave 60% of their endowment as an initial gift. To the left of this 60% threshold, participants with a higher belief were more likely to opt in for public recognition compared to those with a lower belief, holding

**Figure 2.** The influence of belief and initial donation on public recognition.

other things equal. On the right of this 60% threshold, participants with a lower believed average donation were more likely to opt in for public recognition compared to those with a higher belief. This implies that for those with a relatively small initial donation (less than 60% of their endowment), the higher their first-order beliefs were, the more likely they would choose to be recognized. However, the influence of beliefs on the choice of recognition decreases as a person's initial donation reaches 60% or more of his or her endowment. These findings imply that public recognition is most effective for generous donors who think others would give less.

Based on the results above, we draw the following conclusions:

**Result 1.** First-order beliefs are positively correlated with people's tendency to give and their contributions.

**Result 2.** People with higher first-order beliefs and low initial donations are more likely to revise their contributions.

**Result 3.** Individuals with higher initial donations and lower first-order beliefs are most likely to choose to be recognized. This indicates that people tend to seek greater reputational returns by standing out.

## Discussions

In this study, we utilized first-order beliefs to study people's donation decisions instead of using an explicit reference point. Offering an explicit reference point may lead donors to gravitate their contributions toward the suggested amount, especially for those who would have given more otherwise (Alpizar *et al.*, 2008; Jones and Linardi, 2014).

Although the chance of donation revision increases participation, yet, we only observed a weak promoting effect on the average donation. Donation revision works better as a nudge for those who begin with a small initial gift but hold a belief that others will give more. Fundraising practitioners may consider providing this group of prospective donors an opportunity to adjust their donations, especially if the goal of the campaign is to increase people's awareness and participation.

Donor recognition is not a one-size-fits-all approach to engage all types of donors, either. As shown in the previous literature, donor recognition crowds out potential donors who prefer to stay anonymous and those who intend to give small gifts (Young *et al.*, 2012; Denis *et al.*, 2020; Luo and Gao, 2023). The results of this study show that donor recognition is more effective for those with a large initial donation and also believe that others would give a small gift as well. Fundraising professionals may consider using donor recognition to effectively influence this particular type of donor.

Our study has its limitations. Out of our total sample size of 224 subjects in the comparison group, only 48 participants revised their donations. While most subjects who revised their donations increased their contributions, 10 subjects chose to decrease their donations. We were not able to draw any statistical inferences about what drives these behavioral differences due to our limited number of observations. This study does not address the causal relationship between beliefs and behaviors.

We selected Doctors Without Borders as the recipient of our experiment given its high visibility during the early onset of the COVID-19 pandemic. We did not measure our participant's personal preferences and attitudes toward this organization, which may affect their donation decisions. This should not influence our study results since participants were randomly assigned to the baseline and the comparison groups and thus, the impact of the differences in people's attitudes should be canceled out. However, the existing literature shows that donors of international health charities tend to be female (Casale and Baumann, 2015), more educated (Casale and Baumann, 2015) and older (Srnrka *et al.*, 2003). Organizations face donors with a wide spectrum of capacities and motivations for giving, who are more likely to possess different types of personal traits, life experiences, cultures and values. More evidence from the field would be necessary to understand how these factors interact with, or even influence beliefs and in turn, donation decisions.

This current study can be extended in two ways. First, future studies may consider including second-order beliefs, i.e., the beliefs about other people's perceptions of how much an average donor would contribute, and how those beliefs interact with donation preferences in determining people's decisions to give. It would also be worthwhile to explore additional treatments, such as an anonymous treatment where donor recognition is not offered, and an observability treatment where donor recognition is mandatory.

## Conclusions

We conducted an online experiment using MTurk workers and college students to investigate how first-order beliefs and initial donations jointly influence people's decisions of donation, revision and recognition. We found that people's beliefs about an average person's contribution are strongly correlated with their own donation decisions and their willingness to donate. The higher the believed donation is, the more likely they will contribute. Besides, people's actual contributions also increase as their belief increases. When facing the opportunity of donation revision, people with a low initial contribution and a high belief are most likely to revise their donations in the presence of public recognition. Moreover, donors with a low belief and a high initial donation are most likely to choose to be recognized. Based on our findings, we recommend fundraising professionals consider providing an opportunity to revise donations for those with higher first-order beliefs and low initial donations. For those with a high initial contribution and low first-order beliefs, public recognition is more effective.

**Supplementary material.** To view supplementary material for this article, please visit <https://doi.org/10.1017/bpp.2023.36>.

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