

Persuadable or Dissuadable Altruists? The Impact of Information of Recipient Characteristics on Giving

Short Title: Persuadable or Dissuadable Altruists

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11 May 2023

Abstract

We investigate how information about recipients' characteristics affects donors' giving as opposed to when no information is available. In a rational model in which information causes a donor to update her assessment of the recipient's deservingness, we introduce the idea that altruism can be "persuadable" ("dissuadable") by information about positive (negative) characteristics. We report data from three experiments in which donors are provided information regarding three recipient characteristics: alcoholism, attending courses, and disability. Across different characteristics, our results are broadly consistent with the predictions of persuadable altruism. Overall, we find a positive net impact of providing information on aggregate giving.

Keywords: Charitable Giving; News; Persuadable Altruism; Dissuadable Altruism

JEL codes: C91; H4; I3

Acknowledgements: This work was supported by the Australian Research Council (DP170101167) and National Natural Science Foundation of China (72203099). We are grateful to participants at the Asia Pacific, European, and World Economic Science Association meetings, the WZB Workshop on Recent Advances in the Economics of Philanthropy, and the Science of Philanthropy Innovations Conference. We thank Luigi Butera, Catherine Eckel, Christine Exley, Ben Grodeck, Stephanie Heger, Jonathan Levy, Erzo Luttmer, Nina Xue, Xiaojian Zhao, the editor, and three referees for helpful comments. All authors contributed equally and are co-first authors of this article. The Monash University Human Research Ethics Committee approved the protocol for this study (Project ID: MonLEE 10003).

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1. Introduction

When soliciting donations, an important consideration for charitable organizations is whether to provide their potential donors with details concerning the characteristics of their clients. Knowing the characteristics of recipients can affect donors' willingness to give (Fong, 2007; Fong and Luttmer, 2011; Fong and Oberholzer-Gee, 2011).¹ For example, donors may be more willing to help if they know that the needy person has been searching for a job. A charity, however, often has clients with both positive and negative characteristics. Assuming organizations cannot manipulate what details to provide if they promise to make recipient characteristics public, a crucial question is whether negative characteristics would offset any effect of positive characteristics on donations. Should organizations withhold the particulars of the recipients from donors to avoid the potential adverse impact of negative characteristics if the goal is to promote donations? In this paper, we examine how positive and negative recipient characteristics affect giving behaviour *as opposed to when no such details are made available*.

To motivate our hypotheses and to inform our results, we develop a rational model of a donor's giving behaviour dependent on recipient deservingness.² A positive (negative) characteristic causes the donor to raise (lower) her assessment of the recipient's deservingness. For instance, compared with a recipient who is not disabled, all else equal, a disabled recipient is likely to be perceived as more in need of assistance or having unequal opportunities and hence deserving of more help.³

The model employs the notion of a donor's subjective prior beliefs of the characteristics of recipients and uses that to understand giving behaviour. The model then describes how the donor's response to information about the recipient's characteristics, *relative to no information*, jointly depends on the position of the donor's subjective prior beliefs of these characteristics and on the shape of the utility function such that the donor's giving decision adjusts with realized characteristics. Throughout the paper, the term "information" is used when referring to the facts we provide potential donors; the term "news" is used when the information differs from the potential donors' priors. Since in our data, all participants but one held less than certain

¹ Similarly, the characteristics and performance of a charity has been shown to affect giving (Butera and Horn, 2020; Exley, 2020; Gneezy et al., 2014; Gordon et al., 2009).

² The Oxford English Dictionary defines "deservingness" as "Worthy of being treated in a particular way, typically of being given assistance."

³ The normative literature on distributive justice (Deutsch, 1975) suggests four allocation principles: equality, merit, need, and efficiency. Donors' perception of recipient deservingness may be determined by various combinations of these principles (Konow, 2003; Scott et al., 2001).

priors and information about a characteristic is provided with certainty, we can classify information as either good or bad news.⁴

The model introduces a simple idea of “persuadable” versus “dissuadable” altruism which we consider to be different types of giving behaviour. Persuadable (dissuadable) altruism is observed when the difference between giving under good news and no information is larger (smaller) than the difference between giving under no information and bad news. As a result, good (bad) news persuades (dissuades) participants to donate more (less). Using the model, we show that persuadable altruism carries an intuitive property: that the donor’s aversion to risk (i.e., rate of diminishing marginal utility) in their altruism is greater under bad news than good news. For example, when a subject with persuadable altruism learns the recipient is less fit for money donations upon receiving bad news, then their marginal altruism quickly diminishes with the size of their gift.

We partner with the Salvation Army to conduct three experiments on charitable giving. Experimental methods help researchers to randomise recipient characteristics that participants observe, hence allowing for causal inferences. It is also possible to elicit donor and nondonors’ beliefs about recipients, which can be challenging to observe using other empirical measures.

We vary the information a donor receives regarding three recipient characteristics: the recipient does or does not present with alcoholism problems (Alcohol), is or is not attending courses to improve employment possibilities (Courses), and is or is not (physically or mentally) disabled (Disabled). Many of the unemployed and disadvantaged clients of the Salvation Army present with these attributes. For each recipient and each characteristic, information provided is either yes, no, or no information.

We choose these three dimensions because previous studies suggest that people’s response to information about recipients’ characteristics may vary depending on the causes of the characteristics, such as choices made and effort exerted by the recipients or luck (Konow, 2003; Fong, 2007; Fong and Luttmer, 2011; Fong and Oberholzer-Gee, 2011). Data from a survey we conducted show that respondents believe alcoholism is mainly caused by “own choices”; attending courses is primarily evidence of “own effort”; and being disabled is mostly the result of “random luck”. This allows us to examine whether the information effect differs depending on the source of the disadvantage. Moreover, although the results highlight giving

⁴ News is therefore a comparison of information provided to participants with certainty 0/1 (the characteristic is not present in the recipient/it is present) and the prior probabilities participants hold about recipient characteristics (in the range of 0-1).

with respect to the information about a single characteristic, our rich data, built on multiple characteristics, offer insights on how information affects the willingness to give to an individual recipient who has both positive and negative characteristics as compared to the no information condition.

In the first experiment, subjects decide how much to give to a recipient based on the information provided. We also ask donors to report their prior beliefs, on the likelihood of recipients having each characteristic, before they make any donation decisions. Our key findings from this experiment are the following: First, subjects give roughly the same amount when no information is provided as when recipients present with alcohol problems, are not taking classes, or are not disabled (what the data suggests is bad news with respect to the deservingness of the recipient). Second, when recipients do not present with alcohol problems, are taking classes, or are disabled (what the data suggests is good news), giving is significantly higher than when no information is provided. Third, when there is both good and bad news, providing information increases overall giving. Fourth, we use the data on prior beliefs to conduct a structural estimation of our model and find that the estimated parameters provide evidence of persuadable altruism.

We conduct two additional experiments to test the robustness of the findings of persuadable altruism. To ensure that the elicitation of beliefs does not affect subsequent donation decisions, we conduct a second experiment in which we do not elicit beliefs before the donation decision. In the third experiment, we ask participants to make only one donation decision to reduce the impact of potentially confounding factors such as attention decay or experimenter demand effects. Results from both the second and the third experiments are consistent with persuadable altruism but not dissuadable altruism.

Finally, our experiments allow us to address the question: “Does information have a positive or negative impact on giving, on aggregate?” We find that the answer is consistent with a prediction of persuadable altruism. When the subjects receive a mix of both good and bad news about the recipients, overall donations are higher when information is provided as compared to our no information condition. That is, resolving risk in recipient characteristics allows the donors to refine their donations. Then, the relatively large gifts from those receiving good news more than compensate for the smaller gifts from those receiving bad news.

Our research makes several contributions to the literature on charitable giving (Bhati and Hansen, 2020; Vesterlund, 2016). Closely related to our study are papers (Fong, 2007; Fong and Luttmer, 2011; Fong and Oberholzer-Gee, 2011) that examine how giving responds

to recipients' good versus bad characteristics.⁵ In Fong (2007), donors could give to either an "industrious" (i.e., actively looking for work) recipient or a "lazy" (i.e., not actively looking for work) recipient. Fong and Luttmer (2011) use audio-visual presentations to manipulate the race and worthiness of recipients; worthy recipients are described as subject to "circumstances beyond their control" and trying to get a job.⁶ Fong and Oberholzer-Gee (2011) allow their dictators to purchase information about why their recipients are poor (either because of physical disability or drug and/or alcohol abuse). These studies typically find that donors give more to recipients with positive characteristics than recipients with negative characteristics.

Addressing our research question requires a condition where subjects are not provided any information. Among the earlier studies, only Fong and Oberholzer-Gee (2011) have a "no information" condition. In their design, participants are told that they have an equal chance of giving to a disabled individual or alcohol/drug user. They find that giving in this no information condition is roughly the average of the amount given when presented with only positive characteristics and the amount given when presented with only negative characteristics. Given our definition of news, the 50% information is either good or bad news depending upon the priors held by the donor. For donors holding a prior of 20% that the recipient is an alcohol/drug user, the information that the probability is 50% would be classified as bad news. As priors were not solicited from subjects in their experiment, it is unclear how the 50% information should be interpreted.

In addition, we contribute to this literature by providing a theoretical framework for the impact of information on giving behavior. According to the framework, persuadable (dissuadable) altruism can present amongst people with various priors and different shapes of the utility function. Our no information condition provides data on the giving amount of people with different priors. In our sample, most subjects held priors between 20% and 80% which suggests that giving in our no information condition should be quite different from giving in Fong and Oberholzer-Gee's 50% information condition. Thus, the comparison of giving between the no information and information conditions offers a more comprehensive and direct test of our hypothesis.

⁵ In Candelo et al. (2019), donors have the option to give to four different recipients varying in "worthiness" (disability status, gender, employment status, and family size). More giving goes to disabled females who are heads of households and those with more children. Studies have also examined the effect on giving if recipients are identifiable as individual victims or merely as part of a statistic in charity advertisements (Small et al., 2007), whether a victim's face in the advertisement expresses happiness or sadness (Small and Verrochi, 2009), and social distance between the donors and the recipients (Candelo et al., 2018).

⁶ The unworthy were described as poor because of "a mixture of factors including bad choices...and bad luck" or poor because of "bad choices" and "many of them wish they could rely on more generous assistance."

More importantly, in contrast to the literature, our study sheds light on whether providing information, on aggregate, can be beneficial assuming information can be both good and bad. We observe that the impact of no information about the recipient on giving is generally equivalent to bad news. We also show that the net impact of information is positive; the bad news does not outweigh the benefits of providing good news regarding recipients.

Our research also differs from previous studies by considering a broader set of recipients' characteristics, which together with different information conditions offers us a rich landscape to understand both the isolated and aggregated impacts of information. Specifically, potential donors may be influenced by three distinct reasons as to why an individual might be in need of assistance: bad luck (disabled), bad choices (alcoholism), and lack of effort (not attending classes). Across all these characteristics, we find evidence of persuadable altruism.

2. Experiments

2.1. Design

To examine giving behaviour conditional on recipients' characteristics, we partner with the Salvation Army's Melbourne 614 Project and use their clients as the recipients of the donations given by the participants in the experiments. All recipients are unemployed and disadvantaged citizens living in Melbourne. For each of the three recipient characteristics, presenting (or not) with alcoholism problems (Alcohol), attending (or not) courses to improve employment possibilities (Courses), and is (or is not) disabled (Disabled), participants are either told the recipient presented with that characteristic (Yes), did not present with that characteristic (No), or are provided no information (NA). This defines a total of $3^3=27$ types of recipients.

We hypothesize that these three characteristics vary on the degree to which they reflect choice, effort, and luck. In particular, relatively speaking, Alcohol may be more associated with choice; Courses with effort; and Disabled with luck. We experimentally validate this supposition by conducting a survey experiment with 60 participants drawn from the same subject pool as the main experiment. Participants were asked for their opinions on the extent to which each of the four causes (choice, effort, luck, or other factors) contributed to the three characteristics (expressed in percent, summing to 100%).⁷ The results are in line with our

⁷ Exerting effort could be considered the result of choice, but choice is not all about effort. For instance, participants in our survey indicate that both effort and choice contribute to both attending courses and (non)alcoholism. However, relatively speaking, on average attending courses is more driven by effort than choice (43.7% vs. 36.8%) and (non)alcoholism is more driven by choice than effort (43.2% vs. 21.5%). See Table D1 in Appendix D.

hypothesis; for Alcohol, the primary cause indicated by respondents was choice; for Courses, it was effort, and for Disabled, the main cause was luck. See instructions of the survey experiment and data analysis of the survey responses in Appendix D.

Building on this, our expectations were that information indicating that a recipient was disabled, was attending courses, or did not present with alcoholism would be interpreted as good news (indicating that the recipient was “deserving” of receiving the participant’s support). Information indicating that a recipient was not disabled, was taking no courses, or did present with alcoholism would be interpreted as bad news (indicating that the recipient was not, or less, “deserving” of receiving the participant’s support).⁸ Table 1 reports how we expected participants to interpret each characteristic.

Table 1: Expected Interpretations of Recipient Characteristics

Information	Interpretation		
	ALCOHOL	COURSES	DISABLED
Yes	Bad (A-)	Good (C+)	Good (D+)
No Information	Neutral (NA)	Neutral (NA)	Neutral (NA)
No	Good(A+)	Bad(C-)	Bad(D-)

In the rest of the paper, we denote A+ (A-) as representing good (bad) news on Alcohol, i.e., being a non-alcoholic (being an alcoholic). Similarly, we denote C+ (C-) as good (bad) news on Courses, i.e., attending courses (not attending courses); and D+ (D-) as good (bad) news on Disabled, i.e., disabled (not disabled).⁹ NA denotes no information.

In a within-subject design, each participant is endowed with \$20 (AUD) facing each of the 27 theoretically possible types of recipients and decides how much, if any, of the \$20 to give to each recipient. Recipients are presented in a random order. At the end of the experiment,

⁸ The general attitudes of people about those that suffer from alcoholism is mixed. Historically, alcoholism was considered a result of a weakness in character. In addition, donors may also believe that clients presenting with alcoholism may be more likely to “misuse” any donation. More modern thought is that it is a disease with a possible genetic basis (Zielinski, 2020). The view that presenting with alcoholism would influence the recipient’s deservingness is summarised nicely by the following quote in this article, “Instead of supporting people who have an addiction, we stigmatise them, blame them and often don’t think they deserve help.”

⁹ Revealing the information that the recipient attends a course means that the recipient attends the course with certainty (probability is equal to 100%). If the participant’s prior for this characteristic is 40%, then the comparison of the prior with information provided implies that this is good news for the participant (100>40). Similarly, if the information revealed is that the recipient is not taking courses (probability is equal to zero), and the participant’s prior for this characteristic is 40%, then the participant is given bad news about the recipient.

a participant is matched with one randomly selected recipient type and the donation to this recipient type is implemented by the Salvation Army which selects at random a client matching this type.¹⁰ Participants are informed that no recipient will receive a donation from more than one participant in each session. To further strengthen the credibility of our experiment, participants receive a hard copy of a formal letter from the Salvation Army, explicitly stating that any donations generated in the experiment will be given to clients according to the rules set in the experiment (see Appendix A).¹¹

We conducted two such within-subject experiments. The two experiments (Donation with Priors and Donation without Priors) differ only in that, in the Donation with Priors experiment, we elicit each participant's priors by asking the following set of questions before they start to make donation decisions:

Before we present the different recipients for your donation decisions, please answer to the best of your ability the following three questions.

Consider 100 randomly selected unemployed recipients of the Salvation Army's 614 project.

- 1) How many of these 100 recipients are alcoholic (Person who is addicted to intoxicating drinks/person who has alcohol dependence/suffers from alcoholism)?*
- 2) How many of these 100 recipients are taking courses to improve skills so as to enhance employment opportunities?*
- 3) How many of these 100 recipients are disabled (Person who has a physical or mental handicap)?*

We incentivized participants' answers by randomly selecting one of the three questions and paying \$1 if the answer is the same as the true number provided by the Salvation Army.

We use the *Donation with Priors* experiment to test our hypotheses, in particular, the predictions from the rational model with respect to priors (as formalised in Section 3). The *Donation without Priors* experiment serves as a robustness test to ensure that the elicitation of beliefs does not affect giving decisions.

¹⁰ Note that a participant makes a giving decision for each of the 27 theoretically possible types exactly once. Thus, there is no new information to be learnt about the distribution of types or the charity. This design feature eliminates the possibility that the participant would update his or her belief about the distribution of types or the charity when moving from one recipient to the next.

¹¹ Recipients receive their donations in the form of checks. In Australia, welfare payments must be paid into a bank account, thus, all recipients in this experiment have access to a personal bank account and can easily cash checks. This was the method recommended by the Melbourne 614 Project.

Finally, we conducted a between-subjects version of the main experiment (*Between-Subjects*) in which each participant was confronted with only one recipient type. To collect enough observations for statistical analysis, instead of collecting data for all 27 recipient types, we only choose types in which no information is provided in at least two of the three characteristics, totalling seven types.¹² Since this experiment was much shorter than the within-subject experiments, to ensure the incentive per unit of time remains comparable, each participant was endowed with \$10, instead of \$20, to make their donation decision. The *Between-Subjects* experiment serves as a further robustness test to ensure that our results cannot be attributed to any experimenter demand effect or be affected by any kind of attention decay.

2.2. Procedure

The two within-subject experiments were conducted in the Monash Laboratory for Experimental Economics (MonLEE). Upon arriving at the lab, subjects were seated according to randomly allocated ID numbers. The experimental instructions, a consent form, and the letter from the Salvation Army (as described above) were provided in paper form and the instructions were read aloud by the experimenter (experimental materials are reproduced in Appendix A). At the end of a session, subjects saw their earnings and were instructed to write them on their receipts. We adopted a double-blind procedure; subjects were not asked to provide their names and signatures. The experimenter read the data from the monitor's computer, matched it with subjects' ID numbers, and placed individual cash payments in sealed envelopes marked with ID numbers. One by one, subjects privately collected their envelopes and left the lab.

For each of the within-subject experiments, we ran three computerized sessions using z-Tree (Fischbacher, 2007). In total, 68 subjects participated in the *Donation with Priors* experiment and 67 subjects participated in the *Donation without Priors* experiment. Sessions lasted approximately 45 minutes with the average payment of \$16, plus \$10 show-up fee.

The *Between-Subjects* experiment was conducted online during a COVID-19 pandemic lockdown. In each session, subjects were admitted into a Zoom meeting with their videos and microphones turned off. They were provided with a link for the instructions embedded in Qualtrics, and the experimenter read out the instructions in the Zoom meeting. We followed the same procedure, as closely as possible, as the within-subject experiments. Since participants' payments were processed via electronic methods, we were unable to implement

¹² The seven types are (Alcohol, Courses, Disability): (NA, NA, NA); (A+, NA, NA); (A-, NA, NA); (NA, C+, NA); (NA, C-, NA); (NA, NA, D+); (NA, NA, D-).

the double-blind procedure in the same manner as in the other two experiments. Electronic payment was, however, handled by the MonLEE administrator who was not part of the research team.

For the *Between-Subjects* experiment, we recruited 269 subjects from the same participant pool and conducted 17 sessions. Treatments with different recipient types were randomized at the subject level within each session. The sessions lasted about 25 minutes with the average payment of \$7, plus a \$5 show-up fee.

3. Theoretical Framework

Our data allow us to evaluate responses in giving to good, bad, and no news. We place particular emphasis on the difference-in-difference in giving, that is, between differences in responses to good news and no information and differences in responses to no information and bad news. To interpret these results, we put forth the following model of giving in response to information of the recipient's characteristics. We model information in one dimension to demonstrate the key results and predictions; all results easily generalize to multiple dimensional information. Section 4.1.5 presents the structural estimation of the multi-dimensional model.¹³

A donor holds a budget $w > 0$ and the utility $u(x, g; N)$ in which $x := w - g$ gives the money kept and g the donation size. $N \in \{0, 1, \emptyset\}$ gives the information state informing the donor of the recipient's characteristics. $N = 0$ corresponds to the state in which the recipient is less warranting of a donation than $N = 1$. We denote a third no-information state by $N = \emptyset$. In our experiment, information may provide evidence on the quality of the recipient such as need derived from disabilities, or the prudent choices of the recipient derived from their

¹³ For the reader's convenience, we collect all of the main assumptions underlying our theoretical framework and report them here. These also appear in the text as we develop the framework.

For the Baseline single-dimension model, we assume:

- 1) information on other characteristics is arbitrary but fixed
- 2) differentiable and separable utility of form $u(x, g; N) = V(x) + G_N(g)$, $N \in \{0, 1\}$
- 3) concavity in $V(x)$ and $G_N(g)$
- 4) increasing differences in altruism, specifically, $G_1(g) - G_0(g)$ increasing in g

For Proposition 2 and corollaries, we assume:

- 5) $V(x) = \alpha_V x - \beta_V x^2$, and $G_N(g) = \alpha_{G,N} g - \beta_{G,N} g^2$

For the multiple-dimension model used for structural estimation, we further assume:

- 6) differentiable and separable utility of form

$$u(x, g; N) = \alpha_V x - \beta_V x^2 + g \sum_T \alpha_{G,N}^T - g^2 \sum_T \beta_{G,N}^T$$

- 7) for the closed form solutions, prior beliefs across characteristics are independent.

education, or a lack of substance addiction. We denote the donor's subjective prior probability that $N = 1$ by $p \in [0,1]$.

We assume the following separable utility:¹⁴

$$u(x, g; N) = V(x) + G_N(g), \quad N \in \{0,1\}$$

We require $V(x)$ and $G_N(g)$ to be increasing and weakly concave in (x, g) , with increasing differences in (g, N) , that is, for $g > g'$:

$$G_1(g) - G_1(g') > G_0(g) - G_0(g')$$

Naturally, good news of the recipient's deservingness for gifts increases the utility that the donor receives from giving a larger gift.

The donor chooses an optimal donation g^* as a solution to the following problem:

$$\begin{aligned} g^* &= \operatorname{argmax}_{g \in [0, w]} E[u(w - g, g; N) | N] \\ &= \operatorname{argmax}_{g \in [0, w]} \begin{cases} V(w - g) + G_0(g) & \text{if } N = 0 \\ V(w - g) + G_1(g) & \text{if } N = 1 \\ V(w - g) + (1 - p)G_0(g) + pG_1(g) & \text{if } N = \emptyset \end{cases} \end{aligned}$$

Denoting g_B^* , g_G^* and g_\emptyset^* as the optimal donations under $N = 0$, $N = 1$, and $N = \emptyset$, respectively, we have the following:

Proposition 1. $g_G^* \geq g_\emptyset^* \geq g_B^*$ and $\frac{\partial}{\partial p} g_\emptyset^* > 0$, with $\lim_{p \rightarrow 0} g_\emptyset^* = g_B^*$ and $\lim_{p \rightarrow 1} g_\emptyset^* = g_G^*$.

Proposition 1 simply establishes the natural predictions that (i) information affects giving, and (ii) the position of priors affects information responses, both in monotonic ways. Moreover, if priors regarding recipients' negative (positive) characteristics are near certainty, then giving under no information is comparable to giving under bad (good) news. Below, we write $g_\emptyset^*(p)$ for optimal giving under no information given prior p .

The three solid blue loci (and designated with arrows) in Figure 1 depict various cases of $g_\emptyset^*(p)$ when $0 \leq g_B^* < g_G^* \leq w$, each case embodying the properties established in

¹⁴ Our theoretical framework does not separate across different motivations for giving, such as pure altruism and warm glow.

Proposition 1. The bottom axis of the figure gives the level of giving under bad news, g_B^* , and the top axis gives the level of giving under good news, g_G^* , both for a given characteristic: Information regarding the other characteristics is arbitrary and assumed to be fixed. Intuitively, for p close to 0 (close to 1) the donor's response to good (bad) news is disproportionately large, because the opposite bad (good) news carries little contrast to her priors. For priors between 0 and 1, the donor's giving under no information monotonically increases toward her giving under good news, thus decreasing the relative size of her response to good news.

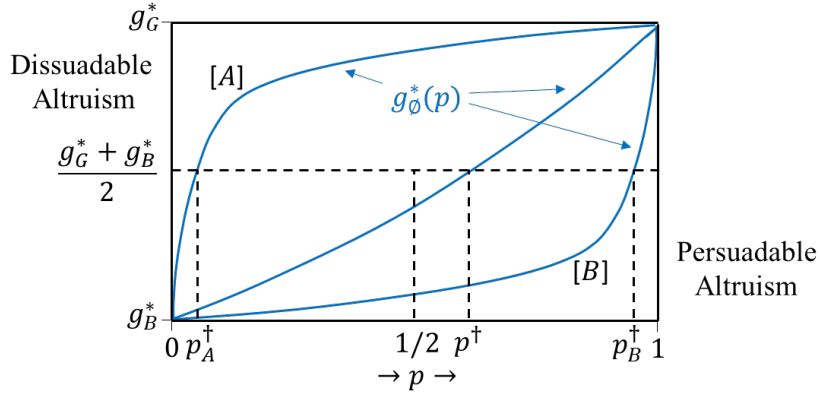


Figure 1: Giving under no information for various cases of the rational model

Note: Blue solid lines $g_0^*(p)$ are functions of the donor's prior p , and relative to giving under good (g_G^*) and bad (g_B^*) news. p^\dagger gives the prior belief that implies equal positive and negative news responses. Blue solid line [A] gives an example of Dissuadable Altruism, blue solid line [B] gives an example of Persuadable Altruism; p_A^+ and p_B^+ give corresponding priors.

Proposition 1 leaves open the question of the position of $g_0^*(p)$ in the interval (g_B^*, g_G^*) as we vary p . To address this, we let p^\dagger denote that value of p such that the size of news responses balances:

$$g_G^* - g_0^*(p^\dagger) = g_0^*(p^\dagger) - g_B^*.$$

By Proposition 1, when p is below p^\dagger , the news response is greatest for good news, that is, $g_G^* - g_0^*(p) > g_0^*(p) - g_B^*$. Conversely, when $p > p^\dagger$, the news response is greatest for bad news, or $g_G^* - g_0^*(p) < g_0^*(p) - g_B^*$. The position of p^\dagger relative to $1/2$ determines which news response (negative or positive) is greatest for most priors. Precisely, a value of p^\dagger above (below) $1/2$, respectively, implies that positive (negative) news response is larger than negative (positive) news response for a range of prior beliefs having a length greater than $1/2$. For the

next result, we consider the simple case of quadratic values in earnings and giving, i.e., we impose additional constraints on the form of $u(x, g; N)$.

Proposition 2. *Assume that $V(x) = \alpha_V x - \beta_V x^2$, $G_N(g) = \alpha_{G,N} g - \beta_{G,N} g^2$. Then, if $\beta_{G,1} = \beta_{G,0}$, the following three properties hold:*

- a) $p^\dagger = 1/2$,
- b) $\frac{dp^\dagger}{d\beta_{G,1}} < 0$, and
- c) $\frac{dp^\dagger}{d\beta_{G,0}} > 0$.

Proposition 2 shows how donation responses to good/bad news depend on the donor's altruistic risk preferences, or precisely, the relative curvature in her altruism utilities $G_0(g)$ and $G_1(g)$. To see this, note that the concavity in the donor's altruism utility, as a function of her donation, scales with $\beta_{G,N}$ for $N = 0, 1$. A donor with $\beta_{G,0} > \beta_{G,1}$ will face more aversion to risk in the size of her donation.¹⁵ Precisely, the rate at which the donor's marginal utility decreases with the size of the gift is greater under bad news, and thus her realized altruism utility is more sensitive to the realization of information. At the knife edge case $\beta_{G,1} = \beta_{G,0}$ we have $p^\dagger = 1/2$. Then, as we increase $\beta_{G,0}$ above $\beta_{G,1}$ the position (value) of p^\dagger shifts right (above $1/2$). Conversely, decreasing $\beta_{G,0}$ below $\beta_{G,1}$ causes p^\dagger to shift left (below $1/2$).

To understand this result, consider a donor with decreasing aversion to risk when donating to more deserving recipients (i.e., $\beta_{G,0} > \beta_{G,1}$). By Proposition 2, such a donor will exhibit larger positive news responses for most priors ranging between $p = 0$ to p below $p^\dagger > 1/2$. Intuitively, learning that the recipient is likely to be deserving of her gift allows the donor to give without fear of contributing to an undeserving individual, resulting in a large positive response to the good news. Indeed, only when the donor holds prior p near 1 does the prediction of a large positive news response become overturned.

Proposition 2 also highlights the full flexibility of the model in rationalizing relative information responses. Both a larger response to bad news for most priors (i.e., p above $p^\dagger < 1/2$) and (conversely) to good news for most priors (i.e., p below $p^\dagger > 1/2$) can be

¹⁵ In our experiment the donor selects a certain (i.e., riskless) amount of money to donate. It is noteworthy that risk preferences continue to play a relevant role for a donor facing (only) risk in the recipient's deservingness.

rationalized by the model. Proposition 2 leads us to the following two competing testable hypotheses:¹⁶

Hypothesis 1 (dissuadable altruism). *For subjects that hold a 50/50 prior (i.e., $p = 1/2$), or equivalently for all priors between p^\dagger and 1 (where $p^\dagger < 1/2$), the difference between giving under good news and no information is smaller than the difference between giving under no information and bad news.*

Hypothesis 2 (persuadable altruism). *For subjects that hold a 50/50 prior (i.e., $p = 1/2$), or equivalently for all priors between 0 and p^\dagger (where $p^\dagger > 1/2$), the difference between giving under good news and no information is larger than the difference between giving under no information and bad news.*

Figure 1 depicts the basic idea of dissuadable versus persuadable altruism. Loci near [A] predict a disproportionately large negative response to bad news for most priors (e.g., priors above p_A^\dagger , which lies below $1/2$). Preferences yielding these $g_\emptyset^*(p)$ exhibit *dissuadable altruism*. Conversely, loci near [B] predict a disproportionately large positive response to good news for most priors (e.g., priors below p_B^\dagger , which lies above $1/2$). Preferences yielding these $g_\emptyset^*(p)$ exhibit *persuadable altruism*.

We have yet to formalise the relationship between dissuadable and persuadable altruism and the overall impact of information on giving. The following notion of affiliation in information and giving will help to clarify this relationship.

Definition (news and giving affiliation). *Information and giving are positively [negatively] affiliated at prior $p \in (0,1)$ if:*

$$pg_G^* + (1 - p)g_B^* > [<]g_\emptyset^*(p).$$

To interpret this definition, when the provision of news (good or bad) of the recipient's characteristics increases (decreases) the subject's giving, then we say that information and giving are positively (negatively) affiliated, respectively. Put differently, positive affiliation in

¹⁶ The hypotheses apply for most priors, in that the density of all priors consistent with a given hypothesis is greater than $1/2$. Note that for extreme high (low) priors, hypothesis 1 (2) will always hold, because these donors will have near certain prior beliefs that news will be good (bad). Therefore, test power will be low when testing between Hypotheses 1 and 2, provided priors are clustered around the extremes 0 or 1. We find little evidence of such clustering (only 1.5%, 1.5% and 1.4% of elicited priors take the extreme value of 0 or 1 in the Alcohol, Courses, and Disabled dimensions, respectively).

information and giving implies that the collection and distribution of information on recipient characteristics increases overall contributions. Conversely, negative affiliation in information and giving implies that the distribution of information decreases overall contributions.

The definition of information and giving affiliation holds for arbitrary prior p . The following corollary establishes a sharp relationship between Hypotheses 1 and 2 and information and giving affiliation at prior $p = 1/2$.

Corollary 1. *Preferences exhibit persuadable altruism (dissuadable altruism) if and only if information and giving are positively (negatively) affiliated at $p = 1/2$.*

By Corollary 1, for a donor holding a 50%/50% prior over good and bad news, the provision of information increases the donor's donation precisely when the donor's preferences exhibit persuadable altruism. Conversely, the provision of information decreases her donation under 50%/50% priors when her preferences exhibit dissuadable altruism. Importantly, real donors are certain to hold priors above or below the knife-edge case of $p = 1/2$. However, we can strengthen Corollary 1 to incorporate arbitrary priors, as follows. For this, we say that $g_\emptyset^*(p)$ is *regular* if it either lies entirely above, entirely below, or along the straight line connecting the points $(0, g_B^*)$ and $(1, g_G^*)$ in Figure 1.

Corollary 2. *If $g_\emptyset^*(p)$ is regular, then preferences exhibit persuadable altruism (dissuadable altruism) if and only if information and giving are positively (negatively) affiliated, for all priors.*

With the strengthened Corollary 2, we see that Hypotheses 1 and 2 yield opposite predictions on the impact of information on overall giving, for all priors. We can expect the absence of information to increase overall giving precisely when donors exhibit dissuadable altruism. Conversely, we can expect the provision of information to increase overall giving precisely when donors exhibit persuadable altruism. This leads us to the following pair of competing hypotheses:

Hypothesis 3 (dissuadable altruism and impact of information on giving): *If donors exhibit dissuadable altruism, information has an overall negative impact on giving.*

Hypothesis 4 (persuadable altruism and impact of information on giving): *If donors exhibit persuadable altruism, information has an overall positive impact on giving.*

Finally, we note the above unidimensional model can be easily extended to the following multi-dimensional model. Section 4.1.5 presents the structural estimation of this model. Consider $V(x) = \alpha_V x - \beta_V x^2$, $G_N^T(g) = \alpha_{G,N}^T g - \beta_{G,N}^T g^2$ for news types $N \in \{0,1\}$ and characteristics $T \in \{Alcohol, Courses, Disabled\}$, and assume separability in altruism utility across characteristics:

$$\begin{aligned} u(x, g; N) &= V(x) + \sum_T G_N^T(g) \\ &= \alpha_V x - \beta_V x^2 + g \sum_T \alpha_{G,N}^T - g^2 \sum_T \beta_{G,N}^T \end{aligned}$$

Defining $\alpha_{G,N} \equiv \sum_T \alpha_{G,N}^T$ and $\beta_{G,N} \equiv \sum_T \beta_{G,N}^T$, and when priors across characteristics are assumed to be independent, then we retain the same closed forms as the unidimensional model.¹⁷ Table 2 provides a summary of the hypotheses and the corresponding conditions for donors' prior beliefs about recipient characteristics.

Table 2: Summary of hypotheses

Hypotheses	Balanced information response condition
Dissuadable altruism (H1): $g_G^* - g_\emptyset^* < g_\emptyset^* - g_B^*$ for each p above $p^\dagger < 1/2$ and below 1; Net negative impact of information (H3)	$p = p^\dagger < 1/2$
Persuadable altruism (H2): $g_G^* - g_\emptyset^* > g_\emptyset^* - g_B^*$ for each p above 0 and below $p^\dagger > 1/2$; Net positive impact of information (H4)	$p = p^\dagger > 1/2$
<i>Notes:</i> g_\emptyset^* denotes optimal giving under no news; g_B^* denotes giving under bad news; and g_G^* denotes giving under good news. p^\dagger denotes the value of p such that the responses to good and bad news relative to no information are balanced.	

With the above hypotheses, in the following, we put forth our results for our experiment in which priors are invoked before the giving task. The rational predictions regarding the relationships between giving and prior beliefs, along with the notions of persuadable and dissuadable altruism, will inform our subsequent analysis.

4. Results

4.1. Donation with Priors Experiment

¹⁷ In this 3-dimensional extension, priors will be distributions over states (Alcohol, Courses, Disabled), i.e., in the 7-simplex. In the experiment, we simplify by eliciting marginal prior beliefs. The assumption of prior independence will fail for correlated characteristics such as alcoholism and drug abuse. Without data on the full joint prior distribution, we take the prior independence case as the natural benchmark for our three characteristics.

Each subject in our experiment makes 27 donation decisions in response to 27 types of information combinations. To unpack the results, we first report the effect of single information (i.e., information on only one of the three characteristics). Second, we extend the analysis of the single information effect to multiple information by using the full sample that includes the cases in which information on the other two characteristics is available. The results reported in the first and second sub-sections help test Hypothesis 1 versus 2. Third, we present results that address the question of whether, when good and bad news are mixed, providing information achieves the goal of more donations overall as compared to not providing any information. This allows us to test whether our data support Hypothesis 3 or 4. Fourth, to determine if bad news on one characteristic offsets the positive effect of good news on another characteristic, we test against an extreme form of information interdependence: Will introducing a single piece of bad news fully crowd out the positive effects of good news? Lastly, with the help of the data on prior beliefs, we structurally estimate the multi-dimensional rational model to complement the reduced form results.

4.1.1. Effect of Single Information

We examine the effect of single information first using the cases in which no information is provided in two of the three characteristics. The baseline comparison group is the case in which no information is provided for any of the three characteristics.

Figure 2 presents the results of giving when information varies on one characteristic and no information is provided on the other two characteristics.¹⁸ We find that giving under good news is significantly higher than under no information ($p = 0.074$ for Alcohol, $p < 0.001$ for Courses and Disabled);¹⁹ however, giving does not significantly differ between bad news and no information.²⁰ This systematic pattern is observed for all three characteristics. For

¹⁸ Even though it is difficult to compare giving in our study with other studies on giving to disadvantaged recipients, we offer the following observations on Fong (2007), a prominent study in the literature; Eckel and Grossman (1996), one of the earliest papers using disadvantaged recipients, in their case, the American Red Cross, which typically targets those impacted by disasters; and Gangadharan et al. (2018) who use the same recipient pool (clients of the Salvation Army's Melbourne 614 project) as the current paper. Unlike Fong, in Eckel and Grossman and Gangadharan et al., donors were not provided information about any specific recipient characteristics. Average giving, as a percent of endowment was 26% in Fong, 30% in Eckel and Grossman, and 35% in Gangadharan et al. In this study, across the three experiments, it is 25%.

¹⁹ All reported p-values have, where appropriate, been adjusted for multiple hypothesis testing (List, Shaikh, and Xu, 2019), see the last column of Table C1 of Appendix C.

²⁰ With respect to the no information and bad news comparison, a power calculation shows that to achieve a two-tailed test of significance at the 5% level, even at a moderate power of 50%, there would need to be at least a ten-fold increase in the sample. More specifically, the required sample size would need to be at least 7,000, 800, and 42,000, respectively, for the Alcohol, Courses, and Disabled dimensions.

example, giving under good news (i.e., that the recipient is disabled) is \$5.07, whereas giving under no information and bad news (i.e., that the recipient is not disabled) is \$1.85 and \$1.81, respectively.

Note, Hypotheses 1 and 2 make opposing statements on the relative magnitude of information response for donors holding prior $p=1/2$ (or equivalently for all priors between p^\dagger and 1 in hypothesis 1 and for all priors between 0 and p^\dagger in hypothesis 2). While this gives a knife-edge scenario, a large majority of reported priors (approximately 80%) were observed to be between 20% and 80% in either the good or bad news directions, for all three of our giving characteristics. The results show that our subjects responded to good news more strongly than to bad news at most priors except for the extreme prior larger than 80% where we have very few observations (see Table 6 below for summary statistics on subjects' reported priors and see Table C15 and Figure C2 in Appendix C for news responses under different priors). This fact, along with the finding that giving under good news is significantly above giving under both no information and bad news for all three characteristics (with Courses and Disabled statistically significant), provides initial evidence consistent with persuadable altruism.²¹

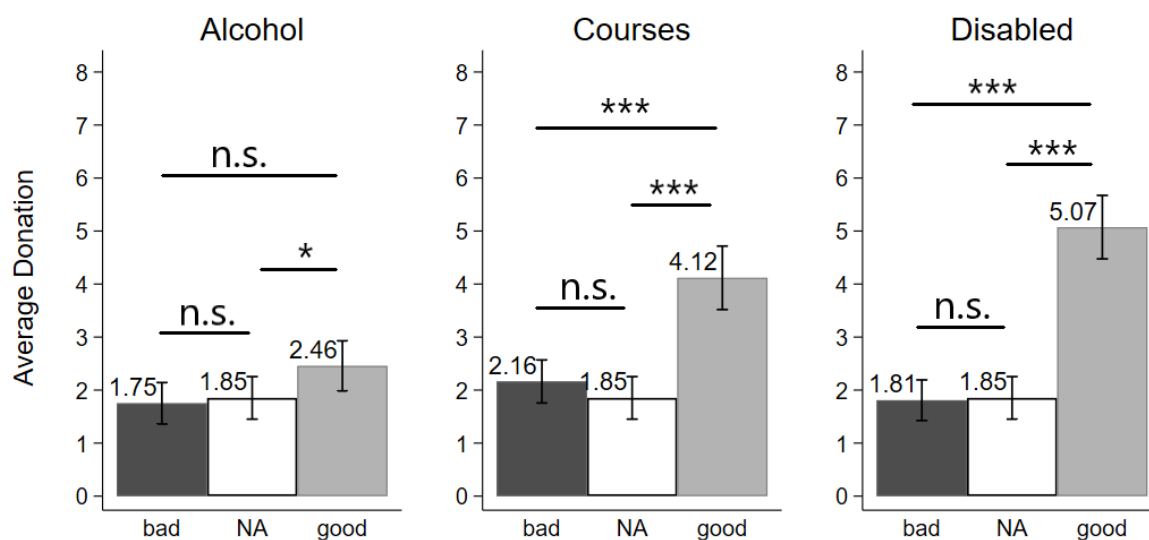


Figure 2: Donations when two characteristics are NAs (Donation with Priors).

²¹ In addition, we calculated the number of participants who behaved consistently with persuadable (dissuadable) altruism for the (News, NA, NA) cases. For each subject, we compare their giving amount when only one characteristic is revealed, separately for the good and bad news cases, with the amount when no information is provided in any of the three domains. For each characteristic, we classify participants as “persuadable” (dissuadable) if their positive response to good news is greater (less) than negative response to bad news. For Disability, Courses, and Alcohol, 47% (4%), 40% (4%), and 10% (10%) of donors, respectively, exhibited behaviour consistent with persuadable (dissuadable) altruism. Thus, the data is consistent with the conclusion of persuadable altruism for Disability and Courses.

Note: The total endowment is \$20. Error bars represent \pm SEM. n.s. denotes no significance at all conventional levels. *** and * denote significance at the 1% and 10% level, respectively. P-values have been adjusted for multiple hypothesis testing (List et al., 2019) as reported in the last column of Table C1 of Appendix C.

We further test the relatively larger *absolute* responses to good news than to bad news by estimating a panel data hurdle regression model with random effects.²² The dependent variable is the donation amount, and the independent variables are the types of information in each dimension with no information as the reference category. We also include a variable for order as recipient types were presented in a random order to each subject.²³ Results reported in column (1) of Table 3 show that the absolute responses to good news are significantly stronger than responses to bad news for the Course and Disabled dimensions ($H_0: |C+| = |C-|, p < 0.001$; $H_0: |D+| = |D-|, p < 0.001$), but not for the Alcohol dimension ($H_0: |A+| = |A-|, p = 0.292$).²⁴

²² Following Moffatt (2016), we specify the following hurdle model:
First hurdle:

$$\begin{aligned} d_i^* &= z_i' \alpha + \epsilon_{1,i} \\ d_i &= \begin{cases} 1 & \text{if } d_i^* > 0 \\ 0 & \text{if } d_i^* \leq 0 \end{cases} \\ \epsilon_{1,i} &\sim N(0,1) \end{aligned}$$

in which z_i' only includes intercept.
Second hurdle:

$$\begin{aligned} donation_{it}^{**} &= x_{it}' \beta + u_i + \epsilon_{2,it} \\ donation_{it}^* &= \begin{cases} donation_{it}^{**} & \text{if } donation_{it}^{**} > 0 \\ 0 & \text{if } donation_{it}^{**} \leq 0 \end{cases} \\ \epsilon_{2,it} &\sim N(0, \sigma^2); u_i \sim N(0, \sigma_u^2); cov(\epsilon_{1,i}, u_i) = 0 \end{aligned}$$

in which x_{it}' includes all variables discussed in the main text.
Observed:

$$donation_{it} = d_i donation_{it}^*$$

The first hurdle has only one outcome per subject and the outcome applies to all observations for that subject. That is, if subject i falls at the first hurdle ($d_i = 0$), then all observations for subject i must be zero ($donation_{it} = 0$).

²³ We do not find any evidence for order effects; the coefficient for the order variable is not significant. We also check for robustness by comparing behaviour in the first 13 decision rounds with those in the last 14 decision rounds in the hurdle regression. The estimates reported in Table C2 of Appendix C (columns 1 and 2) suggest that the relative strengths of responses to good or bad news compared to no information are not significantly different in the latter rounds. There is however some weak evidence for lower donation under no information in latter rounds.

²⁴ To test for robustness, we also estimate a random effects Probit model which treats giving or not as a binary variable, and a random effects two-limit Tobit model with an upper limit of \$20 and a lower limit of \$0. The results are reported in Table C3 of Appendix C and are similar to those using the hurdle specification.

Table 3: Panel data regression analysis and hypothesis tests of the strength of information effects (Donation with Priors experiment)

	(1) Single Information ^a	(2) Full Sample
A+	1.323** (0.613)	0.975*** (0.217)
A-	-0.179 (0.634)	-0.837*** (0.224)
C+	4.272*** (0.594)	3.397*** (0.219)
C-	0.859 (0.616)	-0.454** (0.227)
D+	5.796*** (0.593)	4.348*** (0.218)
D-	-0.059 (0.630)	-0.773*** (0.230)
Order	-0.020 (0.022)	-0.009 (0.012)
Constant	0.378 (0.962)	0.920** (0.439)
$H0: A+ = A- $	$p = 0.292$	$p = 0.718$
$H0: C+ = C- $	$p < 0.001$	$p < 0.001$
$H0: D+ = D- $	$p < 0.001$	$p < 0.001$
$H0: A+ = C+$	$p < 0.001$	$p < 0.001$
$H0: A+ = D+$	$p < 0.001$	$p < 0.001$
$H0: C+ = D+$	$p = 0.004$	$p = 0.002$
<i>N</i>	476	1836

Notes: This table reports estimates using a random effects (at the participant level) hurdle model. Standard errors are reported in parentheses. No information is the reference category. *** $p < 0.01$, ** $p < 0.05$.

a: sample restricted to the subset panel in which there is no information (NA) in two dimensions.

Finally, we observe that the strength of responses to good news varies on the manipulated dimension of the characteristic. The response to good news appears strongest for Disabled, moderate for Courses, and weakest for Alcohol. The estimates in column (1) of Table 3 provide statistical evidence rejecting the hypotheses ($H0: A+ = C+$; $A+ = D+$; $C+ = D+$); that responses to good news across dimensions are the same.

4.1.2. Full Sample

We now extend the analysis to the full sample. For example, we can compare the amount given to two recipients who both present with alcoholism and are not taking courses, but differ on the information regarding disability. The average donation for each of the 27 recipient types is

reported in Table C4 of Appendix C. Note that each type of information in each dimension appears in exactly nine giving scenarios. Therefore, to provide a systematic view of the full sample, we aggregate the estimated response to each type of information in each dimension over the relevant nine scenarios in a regression framework.

The results generally confirm the single information findings: giving under good news is significantly higher than under no information ($p = 0.004$ for Alcohol, $p < 0.001$ for Courses and Disabled).²⁵ In contrast to the single information finding, giving under bad news is significantly lower than under no information ($p = 0.061$ for Alcohol, $p = 0.031$ for Courses, $p = 0.013$ for Disabled). But note that its economic significance, relative to good news, is minor. This is confirmed in hurdle regression results reported in column (2) of Table 3, which shows that the *absolute* responses to good news are still significantly stronger than responses to bad news for the Course and Disabled dimensions ($H_0: |C+| = |C-|$, $p < 0.001$; $H_0: |D+| = |D-|$, $p < 0.001$), but not for the Alcohol dimension ($H_0: |A+| = |A-|$, $p = 0.718$). This finding provides strong evidence for persuadable altruism in the full sample, although it is not as extreme as in the single information subsample in which no information is provided in two of the three characteristics.

It is worth noting, for Alcohol, while the interpretation of information is largely as reported in Table 1, the data is relatively noisy, reflecting the mixed attitudes regarding alcoholism (see Section 2.1). Our subject pool has grown up during a time when beliefs about the causes of alcoholism have been changing and the post-experiment, free-form comments reflect this difference of thought. This inconsistency is also reflected in results from our survey in which we asked subjects their opinions on the extent to which each of the four causes (own choice, own effort, random luck, or other factors) contributed to the three characteristics (see Appendix D). While the modal response for Alcoholism is “own choice,” a large proportion also choose “other factors” as a response. This mixed attitude may explain the inconsistency in the results with respect to A+ and A-. For instance, the response to A+ is not significant under the Probit specification using the subsample, as reported in Table C2 (column 2) and in Table C3 (column 1). Similarly, the response to A- is only statistically significant in the full sample, as shown in Table 3, and Tables C2 and C3.

Finally, we confirm the finding from the single information effect, that the response to good news is strongest for Disabled, moderate for Courses, and weakest for Alcohol. The

²⁵ Similar to those reported in the previous section, p-values have been adjusted for multiple hypothesis testing (List et al., 2019). See the last column of Table C5 of Appendix C.

estimates in column (2) of Table 3 report that the hypothesis that responses to good news across dimensions are the same is rejected for all pairwise comparisons ($H_0: A^+ = C^+; A^+ = D^+; C^+ = D^+$). Our first result thus follows:

Result 1: *In our data, donors exhibit persuadable altruism as opposed to dissuadable altruism: The difference between giving under good news and no information is larger than the difference between giving under no information and bad news, supporting Hypothesis 2 and rejecting Hypothesis 1.*

4.1.3. The Overall Impact of Information on Giving

We now provide evidence to address the policy relevant question that motivates our experiments: “When there is both good and bad news, can providing information achieve more donations overall as compared to not providing any information?” The answer to this question is formalized as a notion of affiliation between information and giving as discussed in Corollaries 1 and 2 (Section 3), which predict that persuadable altruism should be accompanied by a positive impact of information on giving.

A direct way to test between Hypotheses 3 and 4 is to estimate overall giving under information using our subjects’ priors and compare it to the actual giving under no information. An alternative way to address this question empirically is to use the distribution for Alcohol (A), Courses (C) and Disabled (D) provided by The Salvation Army (0.4 for A+, 0.3 for C+ and 0.1 for D+). If donors’ priors outside of our experimental sample are closer to the actual distribution, this estimate can be more informative in practice. We use both approaches for the condition when they receive information for only one of the three characteristics and no information for the other two characteristics and for the condition when they receive information for all three characteristics.

For each subject, we calculate a weighted average for a characteristic when no information is provided for the other two characteristics; giving under good news for the given characteristic is multiplied by the likelihood of that characteristic outcome and added to the corresponding multiplication for bad news. For example, for a subject who donated \$10 for scenario (C+, NA, NA) and \$1 for scenario (C-, NA, NA), the weighted average donation with information would equal \$3.70 ($= 0.3 * \$10 + 0.7 * \1) if we use the true distribution provided by the Salvation Army. Finally, an average over all subjects was calculated. For the condition when information is received for all three characteristics (ALL), weighted averages were calculated, using joint probabilities computed by multiplying the respective characteristic

probabilities.²⁶ All results are reported in Table 4. In all cases, the p-values are from Wilcoxon signed-rank tests between the Information and No Information averages.²⁷

Table 4: Estimated giving for Information versus actual giving for No Information (NA)

Characteristic	NA (\$)	Information (subjects' priors)		Information (Salvation Army distribution)	
		Estimated giving (\$)	vs. NA p-value	Estimated giving (\$)	vs. NA p-value
Alcohol (A)	1.85	2.13	0.13	2.03	0.19
Courses (C)	1.85	3.02	0.00	2.75	0.00
Disabled (D)	1.85	2.89	0.00	2.14	0.00
ALL	1.85	3.52	0.00	2.47	0.00

Irrespective of the approach we use, we find that the positive impact on giving from good news for Courses and Disabled has a significantly greater effect than the negative impact from bad news, on average; the difference for Alcohol is insignificant. Therefore, collecting and providing information increases average contributions. When using observations in which information is provided on all three characteristics (ALL), a similar conclusion is obtained.

Result 2: *Inherently compatible with persuadable altruism, the provision of information increases overall giving, supporting Hypothesis 4 and rejecting Hypothesis 3.*

4.1.4. Information Interdependence

So far, our main analysis has focused on comparative statics of varying the type of information on one characteristic while holding fixed the type of information on other characteristics. The rational model is flexible enough to accommodate both information independence (i.e., information effects do not interact across characteristics) and information crowding in or out (i.e., information on one characteristic may strengthen or mute the information effect on another characteristic). In this section, we test against an extreme form of information interdependence: Will introducing a single piece of bad news fully crowd out the positive effects of good news? We refer to this as full information crowding out. For instance, given

²⁶ For example, the probability of (A+, C-, D+) is calculated as $0.4(1-0.3)0.1=0.028$. Here, zero correlation between the three characteristics in the population is assumed because the joint distribution of characteristics was not provided by the Salvation Army. Regardless of the specific function of the joint distribution, the key insights should hold, since giving under information separately for each characteristic is always higher than giving under no information.

²⁷ Figure C1 in Appendix C plots each subject's giving under information versus giving under no information for each characteristic or averaged across all characteristics. It shows that almost all points lie on one side of the diagonal, suggesting that it is not a small number of subjects driving the information effect on aggregate giving.

good news for two characteristics, is the giving amount still higher than the no information condition when there is bad news for the third characteristic? Conducting this test is important because full information crowding out would render policies that reveal multiple dimensions of recipients' characteristics ineffective. For example, if a charity inadvertently reveals bad news about one characteristic of a recipient, it may completely crowd out any impact of good news about the recipient on other characteristics.

To this end, we first test if bad news for one characteristic crowds out the beneficial effects of two positive characteristics. We hold fixed good news in two characteristics while varying the information in the third characteristic (e.g., A+; C+; D- versus NA, NA, NA). We also report the giving amount in the corresponding two good news only condition (e.g., A+, C+, NA) as a reference point. See Table 5.

Table 5: Testing full information crowding out: Donation with Priors

	Condition			Giving	vs. No Information Condition
	Alcoholic	Course	Disability		Giving (1.85) (p-value)
Two Good News	A+	C+	NA	4.76	0.000
	A+	C+	D-	4.34	0.000
	A+	NA	D+	5.75	0.000
	A+	C-	D+	5.37	0.000
	NA	C+	D+	6.71	0.000
	A-	C+	D+	6.06	0.000
One Good News	A+	NA	NA	2.46	0.017
	A+	C-	NA	2.35	0.008
	A+	NA	D-	2.25	0.049
	NA	C+	NA	4.12	0.000
	A-	C+	NA	3.74	0.000
	NA	C+	D-	3.85	0.000
	NA	NA	D+	5.07	0.000
	NA	C-	D+	4.57	0.000
	A-	NA	D+	3.96	0.000

Overall, there is no evidence supporting full information crowding out. Relative to giving (\$1.85) in the no information condition (NA, NA, NA), having good news in the other two characteristics strongly increases giving regardless of the type of information in the third characteristic; \$4.34, \$5.37, and \$6.06 are all significantly greater than \$1.85. This observation

also holds true for the case of good news in one characteristic, no information in a second characteristic, and introducing bad news in the third characteristic.²⁸

4.1.5. Structural Estimation

The elicited prior belief data allow us to structurally estimate the multi-dimensional model presented in Section 3, complement the findings from the reduced-form approach, and help in further examining their robustness. The structural approach can also provide quantitative estimates of the value of the prior that balances the responses to good and bad news relative to no information. Before we turn towards the structural approach, we briefly report the descriptive statistics of the priors in Table 6. For ease of interpretation, all characteristics are reported in the positive domain. On average, donors believe the probability of a recipient being a non-alcoholic is about 60%, the probability of attending courses about 40% and the probability of being disabled about 30%.

Table 6: Priors (in %)*

	% reported by Salvation Army	Mean (Std. Dev.)	Median	Min. (n)	Max. (n)	% with $20\% \leq \text{prior} \leq 80\%$
Non-alcoholic (A+)	40	58.45 (19.82)	60	0 (1) ⁺	95 (3)	88.2%
Courses (C+)	30	41.74 (19.92)	40	10 (3)	100 (1) ⁺	86.8%
Disabled (D+)	10	33.43 (19.43)	30	0 (1) ⁺	75 (4)	79.4%

* For ease of interpretation, all characteristics are reported in the positive domain. + These three extreme priors of 0 and 100 are reported by the same subject.

When priors across characteristics are assumed independent of each other (see footnote 15), then the additively separable utility function across characteristics, as reported in Section 3, takes the following closed-form solution for optimal giving (see proof of Proposition 2 in Appendix B; with minor adaptations to this we can obtain similar solutions for the multi-dimensional model):

²⁸ We also compare the giving amount in the bad news condition with the corresponding only good news condition (e.g., row 1 versus row 2). The differences are insignificant except for (A+, C+, NA) vs. (A+, C+, D-), (NA, C+, D+) vs. (A-, C+, D+), and (NA, NA, D+) vs. (A-, NA, D+).

$$g_N^* = \frac{\alpha_{G,1}^A p_A + \alpha_{G,0}^A (1 - p_A) + \alpha_{G,1}^C p_C + \alpha_{G,0}^C (1 - p_C) + \alpha_{G,1}^D p_D + \alpha_{G,0}^D (1 - p_D) - \alpha_V + 2\beta_V w}{2 \left(\beta_{G,1}^A p_A + \beta_{G,0}^A (1 - p_A) + \beta_{G,1}^C p_C + \beta_{G,0}^C (1 - p_C) + \beta_{G,1}^D p_D + \beta_{G,0}^D (1 - p_D) + \beta_V \right)},$$

in which $0 \leq g_N^* \leq w$, $N_T = \phi \rightarrow p_T \equiv p_T$, $T \in \{A, C, D\}$; $N_T = 0 \rightarrow p_T = 0$; $N_T = 1 \rightarrow p_T = 1$. That is, in this closed-form function of donation, p_T takes on the value of a subject's prior under no information; it equals to 0 (1) under bad (good) news. By Proposition 2, persuadable altruism implies that $\sum_T \beta_{G,0}^T \equiv \beta_{G,0} > \beta_{G,1} \equiv \sum_T \beta_{G,1}^T$, $T \in \{A, C, D\}$.

We can further derive a closed-form solution for p^\dagger , which denotes the value of p such that the responses to good and bad news relative to no information are balanced:

$$p^\dagger = \frac{\alpha_V - \alpha_{G,0} - 2\beta_V w + \bar{g}_{news}(\beta_{G,0} + \beta_V)}{\alpha_{G,1} - \alpha_{G,0} - \bar{g}_{news}(\beta_{G,1} - \beta_{G,0})},$$

in which $\bar{g}_{news} \equiv \frac{1}{2} \left(\frac{\alpha_{G,1} - \alpha_V + 2\beta_V w}{(\beta_{G,1} + \beta_V)} + \frac{\alpha_{G,0} - \alpha_V + 2\beta_V w}{(\beta_{G,0} + \beta_V)} \right)$ and $\alpha_{G,N} \equiv \sum_T \alpha_{G,N}^T$, $N \in \{0, 1\}$.

Persuadable altruism implies that $p^\dagger > 1/2$ (see Figure 1).

For the structural estimation, first note that the numerator of the closed-form solution of g_N^* essentially serves as a scaling factor. To estimate the key parameters of interest, that is, $\beta_{G,0}^T$ and $\beta_{G,1}^T$, $T \in \{A, C, D\}$, we set $\alpha_{G,1}^A = \alpha_{G,0}^A = \alpha_{G,1}^C = \alpha_{G,0}^C = \alpha_{G,1}^D = \alpha_{G,0}^D \equiv 50$, $\alpha_V \equiv 100$ and $\beta_V \equiv 0$. We also set $\beta_{G,0}^A = \beta_{G,0}^C = \beta_{G,0}^D \equiv \beta_{G,0}^G$ to obtain a sharp convergence in estimation. Given the finding that giving under bad news is very similar across different characteristics (see Figure 2), this is a mild assumption that allows us to focus more sharply on $\beta_{G,1}^T$ which drives differential giving under good news across different characteristics. In sum, the set of parameters to be estimated is reduced to $\{\beta_{G,1}^A, \beta_{G,1}^C, \beta_{G,1}^D, \beta_{G,0}^G\}$. Thus, we estimate the following nonlinear random effects model using maximum likelihood:

$$\log(g_N^{it}) = \log(50) - \log \left(2 \left(\beta_{G,1}^A p_A^{it} + \beta_{G,1}^C p_C^{it} + \beta_{G,1}^D p_D^{it} + \beta_{G,0}^G (3 - p_A^{it} - p_C^{it} - p_D^{it}) \right) \right) + \epsilon_{it},$$

in which g_N^{it} is the amount given by subject i in round t . p_T^{it} , $T \in \{A, C, D\}$ takes on the value of a subject i 's prior under no information for characteristic T ; it equals to 0 (1) under bad (good) news for subject i in round t . ϵ_{it} denotes the residual with noise uncorrelated across subjects and rounds. Note that by taking the logarithmic function of g_N^{it} , we focus on the subset of the sample in which subjects give a positive amount. This leads to more precise estimates of

the key parameters of interest. The qualitative conclusion, however, is similar if we do not use the logarithmic function and therefore perform estimation using the full sample.

Table 7 reports the results from the structural estimation. The key finding is that $3\beta_{G,0}^G$ is larger than $\sum_T \beta_{G,1}^T$, $T \in \{A, C, D\}$ ($p < 0.001$). This is consistent with persuadable altruism as a general pattern. We also find that $\beta_{G,0}^G$ is very close to $\beta_{G,1}^A$ ($p = 0.808$) but much larger than $\beta_{G,1}^C$ and $\beta_{G,1}^D$ ($p < 0.001$), which are also consistent with our previous finding that the response in giving to good news is much stronger in Courses and Disabled dimensions than in the Alcohol dimension.

Table 7: Structural estimates

	Coef. Estimate (Std. Err.)
$\beta_{G,1}^A$	2.643 (0.318)
$\beta_{G,1}^C$	0.761 (0.305)
$\beta_{G,1}^D$	0.634 (0.302)
$\beta_{G,0}^G$	2.731 (0.144)
$var(\epsilon_{it})$	0.763 (0.033)
Log likelihood	-1346.5237
N	1057

Finally, we can recover the estimate of p^\dagger , the value of which balances the responses to good and bad news relative to no information. Given our scaling parameters and assumptions, $p^\dagger = \frac{\beta_{G,0}}{\beta_{G,0} + \beta_{G,1}}$. Thus, the estimate of p^\dagger is 0.782 and 0.812 for Courses and Disable dimensions respectively, both of which are larger than 0.5 and consistent with persuadable altruism (see Figure 1, solid line [B]). However, the estimate is 0.508 for the Alcohol dimension, suggesting neither persuadable altruism nor dissuadable altruism and echoing the somewhat mixed evidence in the reduced form results about this characteristic.

4.2. Robustness of results

In this section, we examine the results from two additional experiments. The *Donation without Priors* experiment serves as a robustness test to ensure that the elicitation of beliefs does not affect giving decisions; the *Between-Subjects* experiment mitigates potential concerns such as experimenter demand effects and attention decay.

Figure 3 presents the average donation (out of the \$20 endowment) in the *Donation without Priors* experiment when there is no information provided in at least two dimensions. The results replicate those from the *Donation with Priors* experiment (Figure 2). We find that giving under good news is significantly higher than under no information; but giving under bad news is not significantly different from giving under no information (see Table C6 of Appendix C for statistical evidence). The strength of response to good news again depends on the dimension of the characteristic, ranked from strongest to weakest by Disabled, Courses, and Alcohol (see column (1) in Table C7 of Appendix C). We also find little evidence that the strength of responses to good (bad) news relative to no information significantly differs between the *Donation with Priors* and the *Donation without Priors* experiment, except for higher donation under no information in the *Donation without Priors* experiment (see column (1) in Table C8 of Appendix C). These results extend to the full sample (see Table C9 for average donation under each scenario; Table C10 replicates Table C6 using the full sample; and see column (2) in Tables C7 and C8 of Appendix C for corresponding analysis using the full sample).

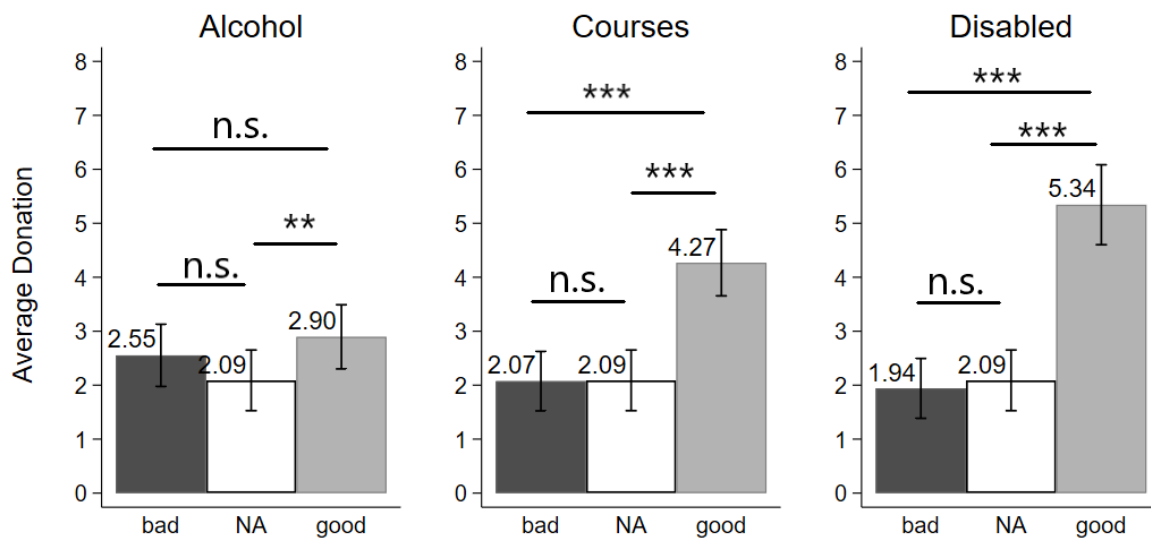


Figure 3: Donations (without Priors) when two characteristics are NAs

Note: The total endowment is \$20. Error bars represent \pm SEM. ns. denotes no significance at all conventional levels. *** and ** denote significance at the 1% and 5% level, respectively. P-values has been adjusted for multiple hypothesis testing (List et al., 2019) as reported in the last column of Table C6 of Appendix C.

Next, similar to Table 4, Table C11 of Appendix C reports estimated overall giving in the *Donation without Priors* experiment under Information and No Information. We find that the positive impact on giving from good news has a significantly greater effect than the

negative impact from bad news for each of the three characteristics. A similar conclusion is obtained when using observations in which information is provided on all three characteristics (ALL). Finally, to test for information interdependence, Table C12 of Appendix C replicates the analysis reported in Table 5, using the data from the *Donations without Priors* experiment. The evidence against full information crowding out remains robust in all cases except two: bad news in Course or Disability crowds out the positive effect of good news in Alcoholism. Overall, the information interdependence patterns do not differ between the *Donation with Priors* and the *Donation without Priors* experiments.

We now turn to the *Between-Subjects* experiment that provides data for the seven scenarios in which at least two characteristics are NAs. The purpose of this experiment is to further explore the robustness of our main result on persuadable altruism.²⁹ The results are generally consistent with the experiments using the within-subject design. Again, giving under good news is significantly higher than under no news; but giving under bad news is not significantly different from under no information (see Figure 4 and Table C13 of Appendix C for statistical evidence). The strength of response to good news relative to no information is similar across all characteristics (see Table C14 of Appendix C). Finally, it is clear from Figure 4 that providing information promotes overall giving.

²⁹ We refrain from making comparisons across the within and between-subject experiments for several reasons, such as differences in procedures, endowments, and timing of the experiments.

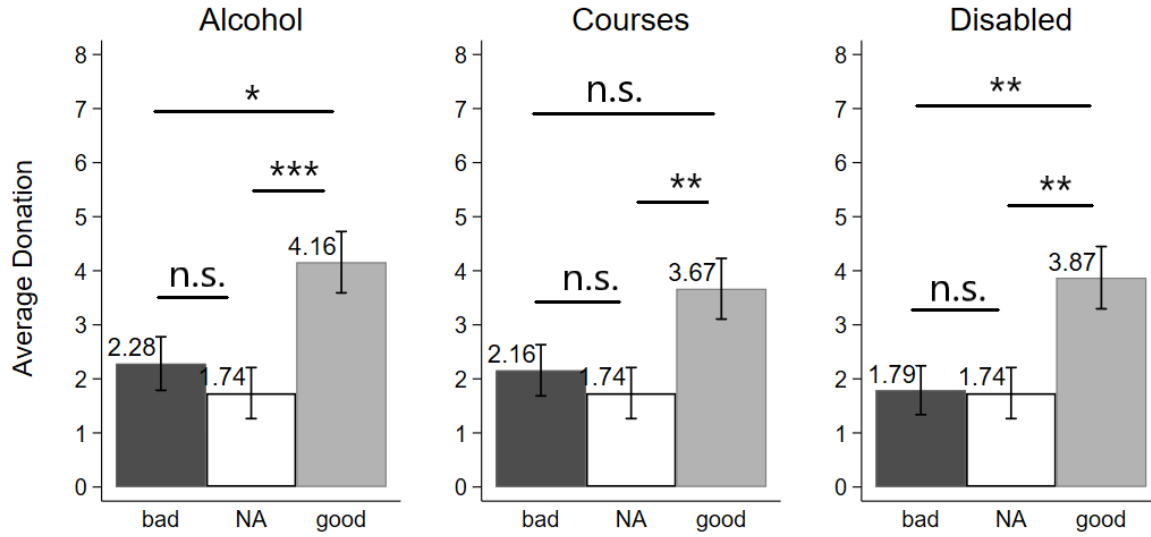


Figure 4: Donations when two characteristics are NAs (Between-Subjects experiment)

Note: The total endowment is \$10. Error bars represent \pm SEM. n.s. denotes no significance at all conventional levels. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. P-values has been adjusted for multiple hypothesis testing (List et al. 2019) as reported in the last column of Table C13 of Appendix C.

In sum, results from our two robustness experiments suggest stronger responses in giving to good news as opposed to bad news with no information being the benchmark. These results are consistent with persuadable altruism.

5. Conclusion

Charitable organizations may be concerned that providing information to donors about the characteristics of recipients could be a double-edged sword. While some information could uncover positive aspects of the recipients, others may reveal negative behaviours. In this paper, we study how good and bad news, separately and together, affect giving. We design giving scenarios in which we vary the information a donor has about a matched recipient. While all recipients are unemployed and disadvantaged, the information varies depending on the recipient's characteristics. Some, for example, present with alcoholism, some are attending courses to retrain themselves and improve their employment prospects, and some are physically or mentally disabled.

We find that the response to good news is significantly stronger than for bad news, with donors donating more to recipients when they do not present with alcoholism or are attending courses or are disabled. This result is consistent with our theoretical prediction of persuadable altruism. Interestingly, giving when exposed to bad news is indistinct from giving with no

information, which argues against the dissuadable altruism hypothesis. This asymmetry between giving in the face of good and bad news is persistent along different characteristics and results in an overall positive effect of information provision; significantly more giving when news (both good and bad) is provided as compared to no information. Finally, using the data on prior beliefs, the structural estimation provides further support for the finding of persuadable altruism.

In our main theoretical analysis, we do not make any assumptions about the donors' subjective priors of the characteristics of recipients. However, because the Salvation Army did not have data on the joint distribution of characteristics, for our structural estimates we assumed that the priors are independent across characteristics. Depending on the characteristics being studied, it is possible that potential donors could believe there is a connection. Building on the findings of this study, it would be interesting in future research to examine the situations in which recipient characteristics are more explicitly dependent on each other and if this dependence influences giving.

Our research provided information about the presence or absence of positive and negative recipient characteristics, which conveyed their deservingness of help to potential donors. An alternative approach, as implemented in Alesina et al. (2023), would be to provide narrative anecdotes of recipients and examine how this would influence giving.³⁰ It is possible that narratives with both negative and positive characteristics could influence perceptions about recipient deservingness in different ways. This approach might also offer an easier way to test the importance of the interdependence of characteristics.

Extending the study such that priors can be elicited from other populations can also be a useful direction for future work. Our findings suggest that even if the priors of charitable donors differ from the participants in our experiment, unless they only hold extremely high priors, we expect to observe persuadable altruism.

From a policy perspective, our results suggest that withholding information about the recipient may not be a successful fundraising strategy. Instead, providing information, as long as some aspects are positive, may be a useful strategy for charities to consider to achieve their fundraising goals. Future research could further explore if information differently influences prospective donors. For example, it is possible that those motivated by pure and impure

³⁰ Alesina et al. (2023) show that narrative anecdotes about the work ethic and contributions made by migrants increase support for migrants and redistribution.

altruism may be affected differently. Similarly, group identity or homophily may also play a role in donors' response to various information conditions.

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