What works to increase charitable donations?

A meta-review with meta-meta-analysis

Alexander K. Saeri[1,2], Peter Slattery[1,2], Joannie Lee[3], Thomas Houlden[3], Neil Farr[4], Romy

Gelber[3], Jake Stone[5], Lee Huuskes[6], Shane Timmons[7], Kai Windle[5], Luke Spajic[8], Luke

Freeman[9], David Moss[10], Jon Behar[11], Stefan Schubert[12], Emily A. C. Grundy[1,2], Michael

Zorker[2]

[1]BehaviourWorks Australia, Monash Sustainable Development Institute, Monash University

[2]Rapid Effective Action Development Initiative (READI)

[3]University of New South Wales

[4]Southern Cross Care

[5]University of Sydney

[6]University of Wollongong

[7]Economic and Social Research Institute

[8]University of Adelaide

[9]Giving What We Can

[10]Rethink Priorities

[11]The Life You Can Save

[12]University of Oxford

Author note

Correspondence concerning this article should be addressed to Alexander Saeri, BehaviourWorks Australia, Monash Sustainable Development Institute, Monash University, 8 Scenic Blvd, Clayton VIC 3800 Australia. Email: alexander.saeri@monash.edu

Abstract

Many charities rely on donations to support their work addressing some of the world's most pressing problems. We conducted a meta-review to determine what interventions work to increase charitable donations. We found 21 systematic reviews incorporating 1,339 primary studies and over 2,139,938 participants. Our meta-meta-analysis estimated the average effect of an intervention on charitable donation size and incidence: $r = 0.08$ (95% CI [0.03, 0.12]). Due to limitations in the included systematic reviews, we are not certain this estimate reflects the true overall effect size. The most robust evidence found suggests charities could increase donations by (1) emphasising individual beneficiaries, (2) increasing the visibility of donations, (3) describing the impact of the donation, and (4) enacting or promoting tax-deductibility of the charity. We make recommendations for improving primary research and reviews about charitable donations, and how to apply the meta-review findings to increase charitable donations.

Keywords

Introduction

Charities address some of the world's most important and neglected problems (MacAskill, 2015; Singer, 2019). Some of the highest-impact (e.g., Against Malaria Foundation; GiveWell, 2021) and most famous (e.g., American Red Cross; Charity Navigator, 2022) charities rely on asking people to give money for no tangible reward (Bendapudi et al., 1996). As a result, effective fundraising is both critical and challenging for nonprofits. We conduct a meta-review of systematic reviews to identify 'what works' to promote charitable donations. Our aim is to provide practitioners and researchers with a resource for identifying which interventions have been investigated, which ones work, and which do not. By charitable donations, we mean the altruistic transfer of money from a person to an organisation that helps people in need (after Bekkers & Wiepking, 2011b). We catalogue systematic reviews because they: (a) search for and assess the evidence about which interventions work (Hulland & Houston, 2020; Stanley et al., 2018), (b) describe the effectiveness of interventions in a way that can be systematically compared, and (c) help practitioners and researchers understand which interventions have good external validity and generalisability (Higgins et al., 2019; Stanley et al., 2018). By synthesising systematic reviews, we can provide stronger recommendations for evidence-informed decision-making than by reviewing individual studies alone (HM Treasury, 2020).

This Meta-Review Investigates Which Hypothesised Drivers of Charitable Giving Have Robust Support

There are several existing reviews of evidence-based charitable promotion (e.g., Bekkers & Wiepking, 2011a, 2011b; Bendapudi et al., 1996; Oppenheimer & Olivola, 2010; Wiepking & Bekkers, 2012). We build on these reviews by conducting a meta-review, also known as an

umbrella review or overview of reviews. Meta-reviews are similar to systematic reviews because they systematically search for and appraise existing research to answer a focused research question. A systematic review aggregates primary studies, but a meta-review aggregates systematic reviews. This allows meta-reviews to cover a wider scope than traditional systematic reviews (Becker & Oxman, 2011). Systematic reviews employ a comprehensive, reproducible search strategy to identify primary research into the effects of an intervention (e.g., providing information about recipients) on a specific outcome (e.g., size of donation) across contexts, while also assessing which situational factors influence those effects. Meta-analyses may form part of a systematic review and use statistics to estimate the average strength of those effects (Higgins et al., 2019). Research standards and practices differ across disciplines, and even within a discipline (e.g., psychology), results on 'what works' to increase charitable donations can conflict due to inconsistent pre-registration, participant demographics, and publication bias (Open Science Collaboration, 2015). Charitable donation as a behaviour is therefore a good fit for a meta-review because useful research on the topic is fragmented across many disciplines including marketing, economics, psychology, and others (Bekkers & Wiepking, 2011b; Bendapudi et al., 1996; Mazodier et al., 2020; Pham & Septianto, 2019; Rothschild, 1979; Septianto et al., 2020; Wallace et al., 2017). Our meta-review aggregates systematic reviews on charitable giving. Where included systematic reviews are accompanied by a meta-analysis, we aggregate those meta-analyses into a meta-meta-analysis to quantify and compare the strength of interventions to promote charitable giving.

We organise the presentation of results from our meta-review using an established and highly-cited model of drivers for charitable donations (Bekkers & Wiepking, 2011b). This narrative review proposed a model where donors are more likely to give when they are prompted

to donate (solicitation) to a cause they know about (awareness of need), if the cost is low enough (costs and benefits) for the effect it has on society (altruism). According to this model, people also donate if they think doing so will make them look good in the eyes of others (reputation), make them feel good (psychological benefits), align with what is important to them (values), and make a meaningful difference (efficacy). Bekkers and Wiepking classified different interventions found in primary research into one or more of these drivers, for example, by discussing how tax deductibility decreases the costs of donation. However, unlike a systematic review, their narrative review approach did not account for publication bias or pre-register inclusion and exclusion criteria; it also did not estimate the relative effectiveness of each driver for influencing charitable donations. In our meta-review, we seek to comprehensively identify all interventions that increase charitable behaviour and that have been the focus of an existing systematic review. Because systematic reviews often include a meta-analysis, which summarises the quantitative effect size or 'strength' of an intervention on charitable donation behaviour, our meta-review will also assess the effectiveness of each driver (e.g., awareness, costs and benefits) in increasing charitable donation behaviour. In this review, we use the Bekkers and Wiepking (2011b) classification to identify which drivers have been the most studied, which have not, and which drivers appear to most influence charitable donation behaviour.

Aim

In this meta-review, we aim to:

1. synthesise the systematic reviews on interventions designed to promote charitable donations across disciplines

2. combine the quantitative effect size estimates from meta-analyses included in the systematic reviews and use meta-meta-analysis to estimate the effectiveness of interventions to promote charitable donations

3. interpret the findings by classifying each intervention according to a widely-used model (Bekkers & Wiepking, 2011b) and best-practice guidelines for evidence informed decision-making (Guyatt et al., 2011; Higgins et al., 2019)

Method

We conducted a meta-review of systematic reviews using established recommendations (Becker & Oxman, 2011; Grant & Booth, 2009; Khangura et al., 2012; Pollock et al., 2017; World Health Organisation, 2017) to synthesise the literature on how to increase charitable donations. We conducted a meta-meta-analysis on any meta-analyses reported in the included systematic reviews. A meta-meta-analytic approach was necessary because it permitted the use of all available information from the original meta-analyses to calculate a pooled effect, while accounting for variability at both the study and meta-analysis level. Our meta-review was prospectively registered on the Open Science Framework (also attached as web appendix; Blinded for review, 2019, July 14; rationale presented in discussion). Details of our search strategy including search strings, screening and selection of studies, data extraction and quality assessment, quantitative synthesis, and certainty assessment are presented in Supplementary File 1 and summarised below.

We searched Scopus, PsycINFO (Ovid), Web of Science, and Database of Abstracts of Reviews of Effects due to their broad but non-overlapping corpora, and their coverage of topic areas relevant for our research question. We conducted searches on July 17th, 2019 and March 4th, 2021. We developed terms for identifying systematic reviews informed by a comprehensive

typology of review methods (Grant & Booth, 2009). Terms for charitable donations as outcomes included: altruis*, charit*, philanthro*, donat*, pledge*, or non-profit. Titles and abstracts were screened in duplicate; full-text articles were screened in duplicate; and included papers were extracted in duplicate. Disputes were resolved by discussion between reviewers, consulting a senior member of the team, if necessary.

Our inclusion criteria were (1) systematic reviews, scoping reviews, or similar reproducible reviews (i.e., those with a reproducible method section describing a searching and screening procedure); (2) reviews describing monetary charitable donations; (3) reviews assessing any population of participants in any context; and (4) written in English (due to logistical constraints) and (5) peer reviewed (although no papers ended up being excluded on the basis of this criteria). Exclusion criteria were (1) primary research reporting new data (e.g., randomised experiments); (2) non-systematic reviews, theory papers, or narrative reviews; (3) reviews on cause-related marketing; and (4) reviews of other kinds of prosocial behaviour (e.g., honesty, non-financial donations). We also conducted forward and backward citation searching (Hinde & Spackman, 2015) via Scopus with no subject or publication requirements. We developed a data extraction template to capture information from each included review, and assessed the quality of the included reviews using an abbreviated list of quality criteria drawn from AMSTAR 2 (Shea et al., 2017). We used the GRADE approach to assess the quality of the evidence across all reviews for each combination of intervention and outcome (Guyatt et al., 2011; Higgins et al., 2019; Hultcrantz et al., 2017). More information about and results of these quality assessments are available in Supplementary File 1.

Many, but not all, systematic reviews also conducted meta-analyses to quantify the size of effects on donations. So we could compare the relative size of effects between these different

meta-analyses, we conducted a meta-meta-analysis, or second-order meta-analysis (Hennessy et al., 2019; Schmidt & Oh, 2013). These models are the best practice for synthesising effects across different meta-analyses because they can compare effect sizes on a common metric while accounting for variability both within- and between-reviews (Hennessy et al., 2019; Schmidt & Oh, 2013). Our primary outcome was the overall pooled effect size of intervention on **donation size**. A secondary outcome was **donation incidence**—whether a donation of any size was provided—because many reviews reported on this dichotomous outcome. We extracted quantitative estimates from reviews that included meta-analyses and converted them to the most commonly used metric (*r*) using the *compute.es* package (Del Re, 2020) in *R (R Core Team, 2020)*. We conducted a meta-meta-analysis using the *metasem* package (Cheung, 2014) and *msemtools* packages (Conigrave, 2019). We used random effects meta-analyses to calculate pooled effects for each mechanism and each outcome, then conducted moderation analyses to assess whether interventions were homogenous within mechanism and outcome. Raw data and code for reproducing the analyses are available at

https://osf.io/465ej/?view_only=8f0ed79442cc4bc59feeb8d0880c6698.

Results

We organise the results as follows. First, we describe the reviews identified and included through the systematic search (Table 1 and Figure 1). Second, we present a meta-meta-analysis for the pooled effect of interventions on donation size and donation incidence (Figure 2). Third, we organise the included interventions using the model of drivers for charitable donations from Bekkers and Wiepking (2011b) to present a meta-meta-analysis of interventions for each driver (Figure 3) and describe each intervention in detail.

Records identified through systematic search

As outlined in Figure 1, we screened 2,294 unique titles and abstracts. The team

subsequently screened 60 full-texts for eligibility, 21 of which were included. Of the included

systematic reviews, 15 included meta-analyses of either donation size or donation incidence.

Characteristics and summaries of each included review are presented in Table 1. Most full-texts

were excluded for being reviews that were not systematic (Weyant, 1996). Ten focused on

prosocial behaviour but did not report charitable donations distinctly, so unique effects on that

outcome could not be discerned (Nagel & Waldmann, 2016). Six were on organisational

behaviour that did not include charitable donations (e.g., the effects of nonprofits becoming more

commercial; Hung, 2020) and five were primary research (Kinnunen & Windmann, 2013) (e.g.,

randomised experiments; Kinnunen & Windmann, 2013). Three reviews did not report prosocial

outcomes (e.g., effects of advertising on sales; Assmus et al., 1984). Quality appraisal and

certainty assessment of the included reviews were conducted consistent with our pre-registered

protocol. Due to limitations of space, we report the results of these assessments in detail in

Supplementary File 1, including a table describing the quality assessment (Table S1) and

certainty assessment (Table S2).

Figure 1

PRISMA Flow Diagram of Search and Filtering of Included Reviews

Insert Table 1 about here.

Table 1

Summary of Included Reviews

Category / Review	Included in meta-meta-analysis	Number of studies (K)	Number of participants (N)	Summary of Results
Legitimizing Paltry Contributions: for example, saying "even a penny will help"				
Andrews et al., 2008	Y	19	2,730	Intervention increased donation incidence ($r = .11$). Effects were homogenous for in-person donations ($r = .18$). Roughly as effective as other incidence techniques, like foot-in-the-door or door-in-the-face.
Bolkan & Rains, 2017	Y	13	3,181	Intervention increased donation incidence (r = .22). Effects were stronger for donors concerned with impression management, and when the legitimization appeared to represent a requester in need. Legitimization was less effective when donors felt they felt they lacked time, desire to give, incentive to give, or found request inconvenient. Donors lacking resources did not increase incidence.
	Y	11	1,531	Reduced donation size with a small-moderate effect ($r = -.23$). The overall funds donated (incidence x size of donation) was equivalent regardless of intervention.
Lee et al., 2016	Y	30	6,400	Intervention increased donation incidence ($d = .19$, 95% CI [.13, .25]). Conversely, significant trend toward reduced size of donation ($d = -.14$, 95% CI [-.22, -.06]). Overall, the total contribution from all participants was slightly larger after intervention ($d = 0.15$).
Observability: both real observation (e.g., experimental confederates) or artificial observation (e.g., watching eyes)				
Bradley et al., 2018	Y	101	594,064	Real observation increased donation incidence ($r = 0.15$). No significant difference between effects on monetary donation and non-monetary prosocial behaviour ($p = .40$). Taking all prosocial outcomes together (i.e., pooling monetary and non-monetary outcomes), effects were larger for repeat interactions, interactions with personal consequences, group social dilemmas (vs. 1:1 bargaining games), and where observation is more intense.
Nettle et al., 2013	Y	7	887	Artificial observation increased donation incidence (OR 1.39, 95% CI [1.02, 1.91]). No effect on size of donation (d = 0.04, p = 0.55).
Northover et al., 2017	Y	21	19,512	No significant effect of surveillance cues on donation size (d = 0.022, 95% CI [-0.08, 0.13]) or on the donation incidence (OR = 0.15, 95% CI [-0.03, 0.35])
Sparks & Barclay, 2013	N	25	NR	Artificial observation. Vote count: 15/16 short exposure studies increased donation incidence; 0/5 long exposure studies increased donation incidence. Difference between short and long exposure effects possibly due to habituation.

Compassion fade / 'identifiable victim': Showing the donor one individual victim rather than a group of victims/recipients

Category / Review	Included in meta-meta-analysis	Number of studies (K)	Number of participants (N)	Summary of Results
Butts et al., 2019	Y	41	13,259	Larger victim group decreased donation incidence intention and behaviour (r = −0.11). Effects mediated by perceived impact and anticipated positive affect. A larger group of victims led to lower anticipated affect (r = −0.12) and lower perceived impact (r = −0.21), which, in turn, reduced incidence behaviour. Weaker effect for certain, severe, and calamitous problems (famine) than uncertain, minor ones (no schoolbooks).

Prosocial media: Non-specific prosocial media (i.e., TV, movies, video games, music, or music videos with prosocial content)

Coyne et al., 2018	Y	72	17,134	Prosocial media did not increase donation size (*r* = 0.09), but increased other prosocial behaviours and cognitions. May be due to specific behaviours (e.g., donating) frequently demonstrated in the media, and therefore, less likely to be imitated.

Crowding out: Side effects from government funding that might decrease donations from the public ('crowding out'), or attract people to donate ('crowding in')?

de Wit & Bekkers, 2017	Y	54	NR	On average, $1 increase in government support leads to $0.17 decrease in private charitable donation size across all studies. In experiments, a $1 increase leads to a $0.64 decrease in private donation size. In archival or survey data, a $1 increase leads to a $0.06 increase in private donation size. Overall, no decisive evidence for government support to crowd out private charitable contributions.
Lu, 2016	N	60	637	No overall effects of government donations on private contributions (unweighted mean = .03). Crowding out is more likely in studies that control for endogeneity (e.g., those that use fixed effects or instrumental variables). Regardless, the effect sizes were too small to support either crowding-out or crowding-in

Moderators in dictator games: One participant is given some money and provided an opportunity to give to another participant with no incentive or response from recipient

Engel, 2011	Y	445	20813	Donors provided with funds donate 28% of those funds. Overall donation incidence of 64% (any size). Controlling for other factors, donations size was higher for older donors, multiple recipients, deserving recipients, recipients who had earned the money, and when donations attracted some type of multiplier. Donation size was lower for donors who earned the money, recipients who already had money, child or student donors, concealed or repeat donations, group decisions, donations to people in closer relationships, and donors forced to choose between keeping all and splitting 50:50.
Larney et al., 2019	N	21	3,233	Providing donors with more funds led to a proportionally smaller sized donation: *d*=0.145, 95% CI [0.022, 0.269]. The size of this difference appeared proportional to the stake: there was medium-large correlation between effect size and log difference in endowment (*r* = 0.411, *p* = .090; sig. one-tailed test, p = 0.045). Log difference was used because some endowments were slightly bigger, and others were up to 1000 times bigger.

Door in the face / 'request then retreat': Making a large, objectionable request followed by a smaller, more reasonable request

Category / Review	Included in meta-meta-analysis	Number of studies (K)	Number of participants (N)	Summary of Results
Feeley et al., 2012	Y	22	NR	When request was monetary, as opposed to research/volunteering/health, the door-in-the-face had a small, non-significant increase in the case of both verbal incidence ("I will donate"; weighted mean difference = 0.153) and behavioural incidence (actual donations; weighted mean difference = .116). For other behaviours (e.g., volunteering), it had a small positive effect on verbal behaviour only.

Promoting intuition instead of deliberation: Encouraging or forcing people to use their 'fast' thinking system by, for example, taxing their cognitive load

Fromell et al., 2020	Y	60	12,574	Promoting intuition had no effect on donation incidence (g = -0.015, 95% CI [-.07, 0.04]). Authors argue that, in most cases, intuitive and deliberate decisions do not conflict. Alternatively, dual-process models do not apply to donations.
	N	22	4336	Promoting intuition among women increased donation incidence (4 percentage points), but not men.
Rand et al., 2016	N	3	1831	There was a significant gender x sex-role x cognitive processing interaction. For women who identified as masculine, deliberative processing reduced donation incidence. For women who identified as feminine, deliberative process did not influence incidence. Gender roles did not influence incidence for men.

Prosocial modelling: Seeing someone else donate (i.e., model the intended behaviour)

Jung et al., 2020	Y	40	11,657	Prosocial modelling increased donation incidence ('material help'): g = .46, 95% CI [.36, .57] and non-material prosocial behaviour. Effect on incidence was stronger if prosocial model was rewarded, if study was published, or if study was in Europe/Asia. Effects were robust to many tests of publication bias.

Pique: asking for strange amounts of money (e.g., 17c) instead of typical denomination (e.g., 10c, $1)

Lee & Feeley, 2017	Y	17	2,136	Pique technique increased donation incidence (r = .27, 95% CI [.19, .34]). No effect on donation size (p = .103), therefore total donations were much higher using pique (r = .49). Effects were stronger when a reason for the odd number was also provided. Pique technique appears to disrupt typical refusal script

Tax deductibility: when government makes donations to a cause tax deductible

Peloza & Steel, 2005	N	138	1,418,212	A $1 reduction in the cost of giving (i.e., via increased tax deductibility) increases total donation (incidence x size) by $1.44, meaning tax deductions are 'treasury efficient.'

Moderators of donation-based crowdfunding: factors that appear to increase or decrease crowdfunding (e.g., GoFundMe)

Salido-Andres et al., 2020	N	92	NR	Donation-based crowdfunding incidence and size is increased by a likeminded sense of community, a persuasive message (e.g., compelling or emotive imagery; value alignment), an easy interface, high donor privacy,

Category / Review	Included in meta-meta-analysis	Number of studies (K)	Number of participants (N)	Summary of Results
				campaigner expertise, a social media profile, and large social networks. Increasing engagement and empowerment of donors appears to help, as does promoter transparency.

Gain-framed messages: for example, 'save a child' rather than 'a child will go to bed hungry'

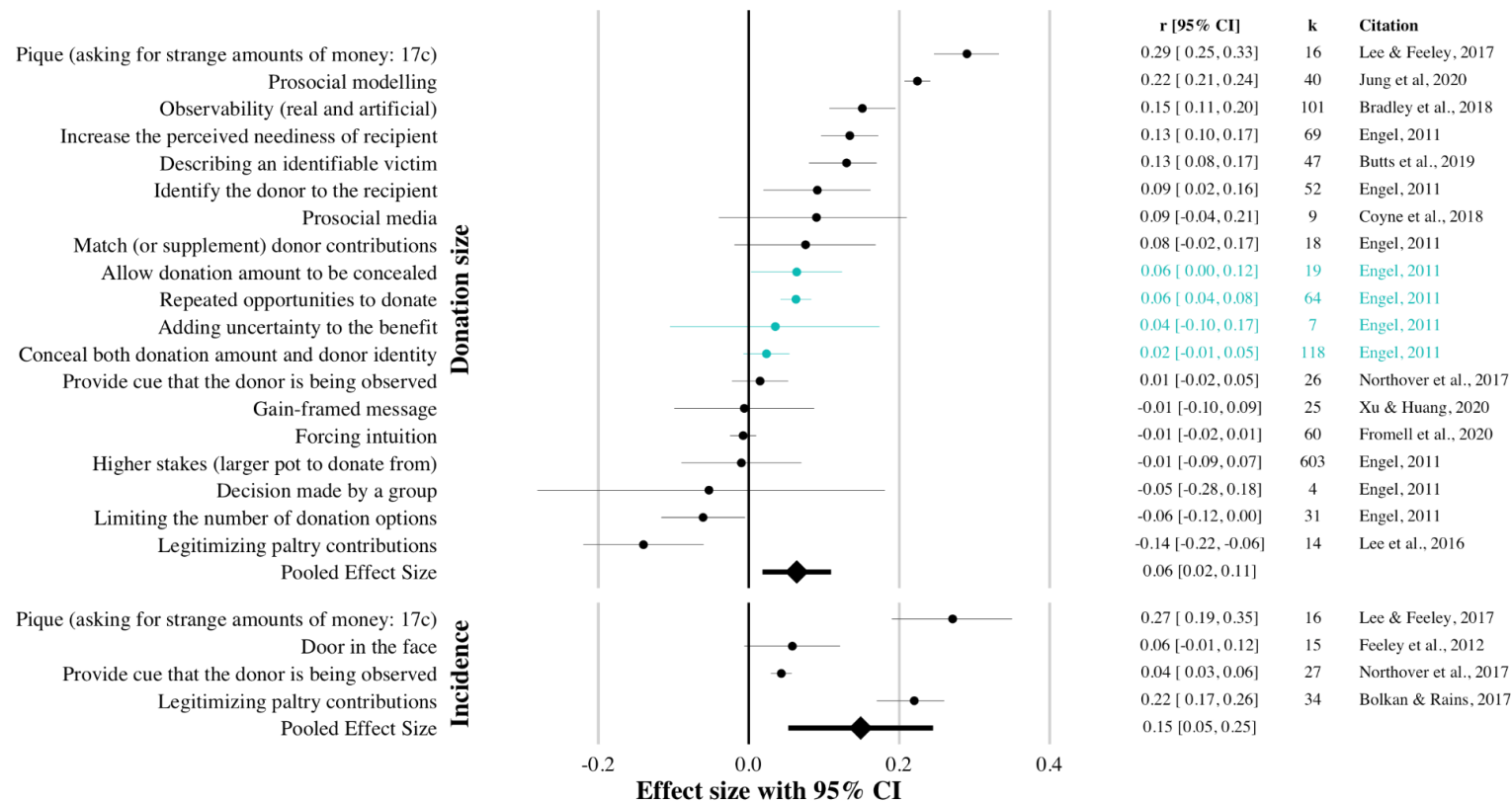| Category / Review	Included in meta-meta-analysis	Number of studies (K)	Number of participants (N)	Summary of Results
Xu & Huang, 2020	Y	25	5811	No effect of gain-framed messages on donation incidence ($r = -.006$, $p = .90$). No moderation by age, gender, student-status, or study setting.

Note. NR = not reported

Meta-meta-analysis of interventions on donation size and donation incidence

As shown in Figure 2, the meta-meta-analytic pooled effect on donation size and donation incidence was small ($r = 0.08$, 95% CI [0.03, 0.12], $K = 23$). The pooled effect was calculated using meta-analyses reported in the included systematic reviews. These effects were heterogeneous between reviews ($I_2^2 = 0.85$), meaning that the different interventions (e.g., pique, identifying recipient) had very different effects on outcomes (e.g., donation size). The effects were not moderated by the specific outcome ($p = .12$). As seen in Figure 2, this means pooled effects were similar for donation incidence ($r = 0.15$, 95% CI [0.05, 0.25], $K = 4$) and donation size ($r = 0.06$, 95% CI [0.02, 0.11], $K = 19$). Raw effect sizes extracted from meta-analyses in the included reviews are available on the Open Science Framework (https://osf.io/465ej/?view_only=8f0ed79442cc4bc59feeb8d0880c6698).

Figure 2

Pooled Effect Sizes and 95% Confidence Intervals from Meta-analyses of Interventions, Grouped by Outcome (Donation Size vs. Incidence)
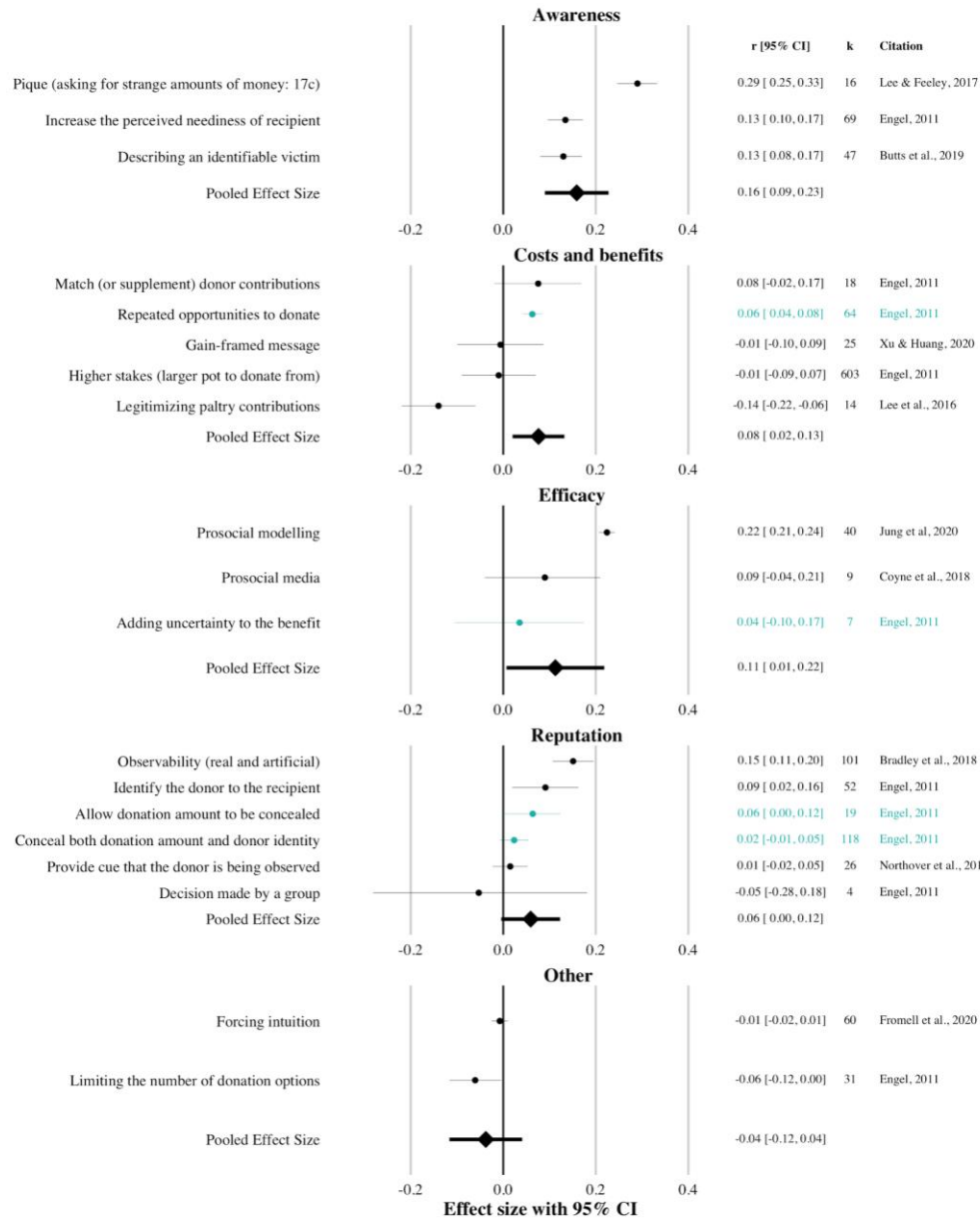

Note. All effect sizes were converted to *r,* allowing for more meaningful comparisons between reviews. Light rows were interventions hypothesised to *reduce* donations. For these interventions, the sign of effects were reversed during analyses to calculate meaningful meta-meta-analytic pooled effect sizes.

Interventions to increase charitable donations organised using Bekkers and Wiepking's (2011) model

We used a mixed-methods approach to synthesise quantitative effect size estimates with a qualitative analysis of findings according to Bekkers and Wiepking (2011b), with descriptions of each included review. We conducted a further meta-meta-analysis (Figure 3) with interventions grouped by the mechanism ascribed by Bekkers and Wiepking (2011b). As shown in Figure 3, the pooled effects of each hypothesised mechanism was significant, however there was large heterogeneity in the effects of each mechanism (all $I^2_{total} > 0.70$). Moderation analyses for interventions within each mechanism were all significant (each $p < .018$), suggesting that the specific design, channel, or context in which the intervention was delivered influenced the effective use of the hypothesised mechanism. In the following sections, we describe each identified behaviour change intervention organised by mechanism.

Figure 3

Pooled Effect of Donation Size (with 95% Confidence Intervals) from Meta-analyses of

Interventions, Grouped by Hypothesised Mechanism

Awareness

	r [95% CI]	k	Citation
Pique (asking for strange amounts of money: 17c)	0.29 [0.25, 0.33]	16	Lee & Feeley, 2017
Increase the perceived neediness of recipient	0.13 [0.10, 0.17]	69	Engel, 2011
Describing an identifiable victim	0.13 [0.08, 0.17]	47	Butts et al., 2019
Pooled Effect Size	0.16 [0.09, 0.23]		

Costs and benefits

	r [95% CI]	k	Citation
Match (or supplement) donor contributions	0.08 [-0.02, 0.17]	18	Engel, 2011
Repeated opportunities to donate	0.06 [0.04, 0.08]	64	Engel, 2011
Gain-framed message	-0.01 [-0.10, 0.09]	25	Xu & Huang, 2020
Higher stakes (larger pot to donate from)	-0.01 [-0.09, 0.07]	603	Engel, 2011
Legitimizing paltry contributions	-0.14 [-0.22, -0.06]	14	Lee et al., 2016
Pooled Effect Size	0.08 [0.02, 0.13]		

Efficacy

	r [95% CI]	k	Citation
Prosocial modelling	0.22 [0.21, 0.24]	40	Jung et al, 2020
Prosocial media	0.09 [-0.04, 0.21]	9	Coyne et al., 2018
Adding uncertainty to the benefit	0.04 [-0.10, 0.17]	7	Engel, 2011
Pooled Effect Size	0.11 [0.01, 0.22]		

Reputation

	r [95% CI]	k	Citation
Observability (real and artificial)	0.15 [0.11, 0.20]	101	Bradley et al., 2018
Identify the donor to the recipient	0.09 [0.02, 0.16]	52	Engel, 2011
Allow donation amount to be concealed	0.06 [0.00, 0.12]	19	Engel, 2011
Conceal both donation amount and donor identity	0.02 [-0.01, 0.05]	118	Engel, 2011
Provide cue that the donor is being observed	0.01 [-0.02, 0.05]	26	Northover et al., 2017
Decision made by a group	-0.05 [-0.28, 0.18]	4	Engel, 2011
Pooled Effect Size	0.06 [0.00, 0.12]		

Other

	r [95% CI]	k	Citation
Forcing intuition	-0.01 [-0.02, 0.01]	60	Fromell et al., 2020
Limiting the number of donation options	-0.06 [-0.12, 0.00]	31	Engel, 2011
Pooled Effect Size	-0.04 [-0.12, 0.04]		

Effect size with 95% CI

Note. All effect sizes were converted to *r* to allow for meaningful comparisons between reviews.

Light rows were interventions hypothesised to *reduce* donations. For these interventions, the sign

of effects were reversed during analyses to calculate meaningful pooled effect sizes.

Interventions to Increase Awareness

On average, strategies designed to increase awareness[1] had small to moderate effects on donations ($r = 0.16$, 95% CI [0.09, 0.23], $K = 3$). In general, charities can increase awareness and therefore donations by piquing donor interest, demonstrating the need, or identifying a victim.

There were large effects from the pique technique. Piquing interest increased both compliance ($r = 0.27$, 95% CI [0.19, 0.35], $k = 16$; Lee & Feeley, 2017) and donation size ($r = 0.29$, 95% CI [0.25, 0.33], $k = 16$; Lee & Feeley, 2017), leading to much larger total revenue ($r = 0.49$, 95% CI [0.45, 0.53], $k = 16$; Lee & Feeley, 2017). The pique technique involved asking donors for unusual amounts of money (17c instead of 10c), and was designed to break the 'refusal script': would-be donors were more likely to stop and ask for a rationale when an odd amount of money was requested of them (Lee & Feeley, 2017). The largest experiment involved a \$3 request so the technique may have questionable ecological validity. It is unclear whether it would also work for requesting \$1,017 instead of \$1,000.

Describing a needy recipient increased donations. This was evaluated in three meta-analyses. Engel found that needy recipients received an increased donation size in dictator games ($r = 0.13$, 95% CI [0.10, 0.17], $k = 69$; Engel, 2011).[2] Neediness was also a mechanism that explained legitimizing paltry contributions (described below). When someone said "even a penny would help", many donors saw the recipient as more needy, which had indirect effects on donation compliance (Bolkan & Rains, 2017). Finally, compared with causes with modest negative impact (e.g., no school books), when a problem was described as severe, certain, and

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[1] We expect 'compassion face' could be categorized under a number of different mechanisms, but relied on Bekkers and Wiepking (2011) who explicitly identified this as 'awareness'.

[2] Dictator games are designed as contrived analogies for donation situations: one participant is given some money and is given the chance to donate to another with no consequences or tangible benefits. Since actual money changes hands to a relative stranger, we deemed it sufficiently analogous to real charitable donations for this review.

calamitous (e.g., natural disaster), donation size increased regardless of whether the victim was identifiable or not (Butts et al., 2019).

Describing an identifiable victim increased donation size. Under most circumstances, donation size increased when donors were presented with a single, 'identifiable victim' ($r = 0.13$, 95% CI [0.08, 0.17], $k = 47$; Butts et al., 2019) than when presented with statistics or multiple recipients. This is also known as 'compassion fade', where a larger number of victims leads to lower perceived impact and lower expected positive affect from donating (Jenni & Loewenstein, 1997). Mediation analyses supported these hypothesised paths (Butts et al., 2019). Empathy had a smaller mediating role: while people showed slightly less empathy for a larger group of people, this lower empathy had only a small effect on donations.

Interventions to Reduce Cost or Increase Benefits

On average, strategies targeting costs and benefits weakly increased donations ($r = 0.08$, 95% CI [0.02, 0.13], $K = 5$). The most influential effects appeared to be imbuing a charity with tax deductibility, but nudges or framing strategies had few effects.

Tax Deductibility Increased Donations. One large meta-analysis of 69 studies ($n = 1,418,212$), examined the impact of tax deductibility on charitable donations (Peloza & Steel, 2005). Effects were reported as price elasticities which could not be converted to effect sizes. They found substantial elasticity: a tax deduction of $1 resulted in an additional $1.44 being donated to charity (confidence interval not reported). The authors found that tax deductions particularly increased the likelihood of bequests. High income donors were no more concerned with tax deductions than lower income donors.

Matching (or Supplementing) Donor Contributions did not Affect Donations. In contrived experiments, when donors were told their funds would be matched (fully or partially),

there was a small but non-significant increase in donations ($r = 0.08$, 95% CI [-0.02, 0.17], $k = 18$; Engel, 2011).

'Door-in-the-Face' Does not Reliably Increase Donations. Door in the face is designed to reduce the perceived cost of donating by initially presenting a high anchor (e.g., "will you donate $1000?"), then asking for something more achievable (e.g., "how about $10?"; also known as the 'request then retreat strategy'). Evidence for this strategy appears weak: donors may be marginally more likely to say they will donate ($r = 0.08$, 95% CI [0.03, 0.12], $k = 7$; Feeley et al., 2012) but this does not translate into actual compliance ($r = 0.06$, 95% CI [-0.01, 0.12], $k = 15$; Feeley et al., 2012).

Repeated Opportunities/Requirements to Donate Decreased Donations. In contrived experiments with repeated rounds, donors gave less when they were aware there would be multiple opportunities to donate ($r = -0.06$, 95% CI [-0.08, -0.04], $k = 64$; Engel, 2011).

Gain-Framed Messaging did not Affect Donations. Prospect theory proposes that small losses loom larger than small gains, but framing appeals for charitable donations as 'losses averted' did not increase the likelihood of donations ($r = -0.01$, 95% CI [-0.10, 0.09], $k = 25$; Xu & Huang, 2020).

Higher Stakes Inconsistently Decreased Donations. Some studies have asked whether those donating from larger pools of money (usually in contrived experiments) are more generous or more frugal. The larger of the two meta-analyses found no relationship between stake size and donations ($r = -0.01$, 95% CI [-0.09, 0.07], $k = 603$; Engel, 2011). But, a follow-up, more focused meta-analysis found that those endowed with more money tended to be less generous, in relative terms, than those endowed with less ($r = -0.07$, 95% CI [-0.03, -0.12], $k = 18$; Larney et

al., 2019). That is, when people had more, they may donate more in absolute terms, but usually donated a lower *percentage* of the money they held.

Legitimizing Paltry Contributions has Negligible Total Benefit. Three systematic reviews investigated the effect of 'legitimising paltry contributions' on charitable donations (usu. words like "even a penny will help"; Andrews et al., 2008; Bolkan & Rains, 2017; Lee et al., 2016). The largest of these reviews found a moderate increase in compliance ($r = 0.22$, 95% CI [0.17, 0.26], $k = 34$; Bolkan & Rains, 2017) which was offset by a *decrease* in the size of the average donation ($r = -0.23$, 95% CI [-0.34, -0.12], $k = 11$; Bolkan & Rains, 2017). The net effect of these competing forces was a non-significant increase in total revenue ($r = 0.03$, 95% CI [-0.01, 0.07], $k = 18$; Bolkan & Rains, 2017). Mediation analyses suggest that the technique increases the perceived neediness of the cause, but that it also vindicates those likely to donate a small amount to avoid judgement (i.e., donors high on 'impression management').

Interventions to Increase Efficacy

On average, strategies targeting efficacy increased donations ($r = 0.11$, 95% CI [0.01, 0.22], $K = 3$). Direct modelling of the desired behaviour—seeing others donate money—appears to increase donations, but general prosocial media does not.

Prosocial Modelling Moderately Increased Donations, Regardless of Media. When people saw others acting prosocially, they were more likely to imitate, including for charitable donations ($r = 0.22$, 95% CI [0.21, 0.24], $k = 40$; Jung et al, 2020). Effects were consistent across media (e.g., direct observation vs watching on TV), age, gender, and culture.

Generic Prosocial Media has Uncertain Effects. Jung and colleagues (2020) looked at studies where the model performed the same behaviour (i.e., the model donated money and the dependent variable was donation too); they moderated for how the model was viewed (real

observation vs. via media). Coyne and colleagues (2018) instead looked at media only (TV, movies, video games, music or music videos) with explicitly prosocial content (but not necessarily donating money). Participants in one study were more likely to donate money while listening to "Love generation" (by Bob Sinclair) rather than "Rock this party" (also Bob Sinclair; Greitemeyer, 2009). This trend, however, was not reliable with small pooled effects on financial donations and a confidence interval including the null hypothesis ($r = 0.09$, 95% CI [-0.04, 0.21], $k = 9$; Coyne et al., 2018). The media seldom demonstrated the exact behaviour being measured (i.e., 'Love generation' does not talk about donations); imitation and efficacy may increase the likelihood of the behaviour being observed but effects do not spill over to nearby prosocial behaviours.

Certainty of Donation Benefit has Little Influence on Donation Compliance. As mentioned previously, correlational studies show that certain calamities appear to attract donations, regardless of interventions like 'identifiable victims' (Butts et al., 2019). Among dictator games, when uncertainty was added to the benefit (e.g., donating lottery tickets) there was no significant reduction in donations ($r = -0.04$, 95% CI [-0.17, 0.10], $k = 7$; Engel, 2011). This may not necessarily translate to different types of uncertainty, however, such as uncertainty that a charity will have an impact.

Interventions to Increase Reputation

On average, strategies targeting reputation slightly increased donations ($r = 0.06$, 95% CI [0.00, 0.12], $K = 6$). In general, people are somewhat more likely to donate when there is some reputational benefit of doing so (e.g., being observed or having the donation amount visible).

Being Observed by Others Increases Donations. After synthesising a large number of studies and participants ($N > 500,000$), Bradley and colleagues found that being observed

significantly increased donations ($r = 0.15$, 95% CI [0.11, 0.20], $k = 101$; Bradley et al., 2018).

Consistent with reputation hypotheses, effects were larger for repeat interactions, interactions

with personal consequences, group social dilemmas (vs. 1:1 bargaining games), and where

observation is more intense. In contrast, Engel moderated his findings by whether or not

donations were concealed. He found donations decreased when concealing the donor ($r = -0.09$,

95% CI [-0.02, -0.16], $k = 52$; Engel, 2011) or the amount donated ($r = -0.06$, 95% CI [-0.12,

0.00], $k = 19$; Engel, 2011), but effects were small.

Artificial **Cues of Being Observed Do Not Reliably Increase Donations.** Three

systematic reviews have explored the effect of artificial surveillance cues on donor generosity

(Sparks & Barclay, 2013; Nettle et al., 2013; Northover et al 2017). Studies have typically

analysed the effect of displaying images of 'watching eyes' on donation decisions made within

economic games, but many include field experiments (e.g., eyes above 'honesty boxes'). The

largest of these reviews found negligible increases in compliance ($r = 0.04$, 95% CI [0.03, 0.06],

$k = 27$; Northover et al., 2017) and donation size ($r = 0.01$, 95% CI [-0.02, 0.05], $k = 26$;

Northover et al., 2017). Effects seem to only work short-term, with few studies finding any long-

term benefits (Sparks & Barclay, 2013). Overall, artificial surveillance may increase the chance

of people donating something in the short term, but the best quality evidence suggests effects are

small.

Decision made by a group. Making a decision as a group may increase the reputational

stakes of signalling altruism but also may diffuse the reputational benefit of donating. Group

decisions had no significant total influence on donations ($r = -0.05$, 95% CI [-0.28, 0.18], $k = 4$;

Engel, 2011) but the confidence intervals are wide due to the small number of studies.

Interventions to Affect Altruism

Few reviews explored the altruism mechanism proposed by Bekkers and Wiepking (2011b). Two reviews explored the crowding out hypothesis—that donors motivated by a desire to have an impact would avoid causes already supported by governments because of diminishing marginal returns (Lu, 2016, $k = 60$; de Wit and Bekkers, 2017, $k = 54$). Neither review found decisive evidence for crowding out. A subset of the studies in the reviews had higher internal validity—they either controlled for confounding statistically or via experimental designs. These studies were more likely to suggest that government funding reduces private donations (de Wit & Bekkers, 2017; Lu, 2016), but given the small, heterogeneous effect sizes, the evidence for a relationship is weak.

Other Influences That Have Been Explored

We did not find reviews of interventions that could be easily classified as 'solicitation', 'psychological benefits', or 'values'. We could not easily classify two review findings on the basis of Bekkers and Wiepking's (2011) mechanisms. One review tested a range of interventions designed to promote intuitive thinking (e.g., high cognitive load), but these studies did not influence donations ($r = -0.01$, 95% CI [-0.02, 0.01], $k = 60$; Fromell et al., 2020). The authors argue that 'fast' and 'slow' thinking are often aligned on issues of charitable donations. Engel (2011) found that reducing the number of options available to the donor decreased the amount they donated.

Discussion

Charities conduct activities that seek to address a wide range of social problems (MacAskill, 2015; Singer, 2019). Our meta-review identified interventions (e.g., piquing donor interest, prosocial modelling, increased neediness, identifiable victims, tax deductibility) that

robustly increase charitable donation size or incidence. The effect size of most interventions on charitable donations were relatively small in terms of increasing the success of individual opportunities to donate ($|r| < 0.1$), but would likely "add up" over time (Funder & Ozer, 2019). It is important to note that our certainty for this estimate is low, due to limitations in many of the included systematic reviews (e.g., many did not assess the quality of included studies; many neglected publication bias). Most effect sizes were far smaller than the average effect size of interventions in marketing science ($r = .24$; Eisend, 2015; Eisend & Tarrahi, 2016) or social psychology ($r = .21$; (Richard et al., 2003). We identified support for some of the mechanisms described in a widely-used model of charitable donations (increasing awareness, efficacy, benefits, and reputation; Bekkers & Wiepking, 2011b) and some gaps in the review-level literature (e.g., systematic reviews assessing psychosocial benefits or values). Most reviews included primary studies that assessed interventions in contrived experiments, but some found consistent results in field and laboratory experiments. The findings suggest that several types of interventions can help to increase charitable donations, but the overall poor quality of the evidence suggests that expert judgement and contextual factors will be critical for good decisions in charity promotion.

Practitioners May Draw From a Range of Robust Interventions to Increase Charitable Donations

Taking the findings together, and notwithstanding the limitations of the included reviews, we recommend practitioners consider the following interventions for promoting charitable donations. Examples of the source, recipient, context, channel, and content of each intervention (Lasswell, 1948; Slattery et al., 2020) is presented in Supplementary Table S3.

Help Donors Feel Confident. When interventions increased donor confidence, they tended to solicit higher donations. Effective strategies included seeing other people who donated money (Jung et al., 2020), not merely seeing people performing 'prosocial behaviours' (Coyne et al., 2018). Theory and preliminary findings would suggest that effects are stronger when viewing those who share our group identity (Chapman et al., 2018, 2020). Uncertainty about the benefit of a charitable donation may cause prospective donors to reduce their donation size; donation matching campaigns may cause prospective donors to slightly increase their contribution (Engel, 2011). Identifiable victims work because donors feel more confident that they could make a meaningful difference (Butts et al., 2019). Overall, the key mechanism is that if prospective donors think they can make a meaningful difference, they are more likely to donate (Butts et al., 2019).

Provide Donors with Meaningful Rationales for Why Donations are Needed. Donors are persuaded by needy recipients (Engel, 2011). Campaigns that say things like 'even a penny will help' can increase the likelihood of an initial donation when it signals the 'desperate need' of the cause (Bolkan & Rains, 2017). Similarly, highlighting a single beneficiary ("identifiable victim") does not change likelihood of donation behaviour if the charitable cause is obviously severe and widespread (Butts et al., 2019). Piquing a donor's interest via odd requests (e.g., 17c) appears to work by prompting a conversation around why the donation is needed (Lee & Feeley, 2017).

Help Donors to Look Good in Front of Others, but Beware Side-Effects. Donations are more likely when donors are observed (Bradley et al., 2018), and when both they and their donation size are identified to recipients (Engel, 2011). Charities should be careful to avoid using this in a way that creates guilt or social pressure (Bennett, 1998) or in a way that is contrived/artificial (Northover et al., 2017; Sparks & Barclay, 2013). Instead, charities can use transparency as a

way of facilitating pride and self-efficacy (Crocker et al., 2017), to minimise the taboo around discussing charitable donations publicly, and to help establish a social norm toward giving (Singer, 2019).

Seek and Advertise Tax Deductibility. Given the large and significant price elasticity from tax deductibility (i.e., tax-deductibility increased donations; Peloza & Steel, 2005), directing effort toward becoming tax deductible will likely pay dividends. While few studies explicitly assessed the impact of advertising deductibility, we assume that doing so may confer some benefits for donations.

Some 'Nudges' and Compliance Techniques Work but Have Modest Expectations. Nudges usually assume that people will be more likely to donate if charities activate their 'fast', intuitive thinking system, but this is not the case (Fromell et al., 2020). It appears that intuitive and deliberate thinking around donations are usually aligned. Nudges and framing strategies such as artificial cues (Northover et al., 2017; Sparks & Barclay, 2013), legitimizing paltry contributions (Bolkan & Rains, 2017), 'door-in-the-face', (Feeley et al., 2012) are not consistently effective.

To Aid Evidence-Informed Decision-Making, Reviews and Research Must Improve

Despite being mostly systematic reviews of randomised trials—which are the best causal evidence for effects of interventions (see Figure 1)—we judged the certainty of all effects to be low. This was because the reviews here, and their included studies, often failed many well established criteria for internal and external validity (Guyatt et al., 2011; Higgins et al., 2019; Hultcrantz et al., 2017). Many interventions were only tested in laboratories or in experiments with relatively trivial amounts of money (<$10). In contrast, many methods of persuasion commonly used in charitable contexts, such as emotional appeals and rational arguments (Bennett, 2019; Caviola et al., 2020; Stannard-Stockton, 2009), were seldom examined directly

by the reviews we found. In addition to reviewing more authentic interventions, review authors could increase the reliability and transparency of their methods via AMSTAR 2 and PRISMA. Registration and standardised reporting checklists like PRISMA (Moher et al., 2010; Page et al., 2021) improve the internal validity of systematic reviews through common expectations of methodology and reporting.

Results Supported Many Mechanisms Proposed by Bekkers and Wiepking (2011)

Many interventions designed to increase awareness, efficacy, and reputation appeared to usually increase donations, as hypothesised by (Bekkers & Wiepking, 2011b).We did not find systematic reviews that assessed other hypothesised mechanisms as classified by Bekkers and Wiepking (2011b), such as solicitation, psychological benefits, and values. However, these findings may not necessarily reflect strengths and weaknesses in the proposed mechanisms, but could reflect the way interventions are categorised. As described above, we followed the categorisation of Bekkers and Wiepking (e.g., identifiable victim as 'awareness') even if we had reason to think that interventions may be better classified elsewhere (i.e., identifiable victim as 'efficacy' or 'psychological benefits'; Butts et al., 2019). Primary studies and non-systematic reviews have found support for some other mechanisms (psychological benefits, Crocker et al., 2017; value alignment, Goenka & van Osselaer, 2019) but for formal model building, researchers should explicitly test whether interventions are operating by the hypothesised mechanism.

Limitations Of Our Meta-Review

By focusing on review-level evidence we necessarily excluded primary studies that would have been useful for charity and non-profit researchers and practitioners. While a review of the 1,339 included primary studies would have been intractable, reviews of primary studies have sufficient granularity to look at mediators and moderators that might be useful across

studies. Instead, we were beholden to the methods of the included reviews. Similarly, we were limited to the interventions selected by previous reviewers, so necessarily omitted interventions not included in any systematic reviews, even though they may inform research and practice (e.g., opt-in vs. opt-out donations; Everett et al., 2015). There may, for example, be a wealth of knowledge on interventions using the internet to drive donations, but since there have been few systematic reviews on that topic, those interventions would have been excluded from our meta-review (Bennett, 2016, 2019; Liang et al., 2014). In a similar vein, focusing on systematic reviews means we may have excluded some more recent, 'cutting-edge' interventions. It often takes a number of years between an intervention gaining traction and it being subject of a systematic review. For example, recent research has shown that donors may *actually* prefer cost-effectiveness indicators (i.e., cost per life saved) to overhead ratios (i.e., percent directed to administrative expenses) but that the latter is usually the focus of decision-making because of the 'evaluability bias': people weigh an attribute based on how easy it is to evaluate (Caviola et al., 2014). However, few studies have examined the effect of publishing cost-effectiveness indicators so it is not yet possible to meta-analyse these interventions. As a result, while the interventions presented in our review have been thoroughly assessed, and many have been shown to be robustly beneficial, there may be other interventions with larger effect sizes not listed here.

Our meta-review prospectively excluded grey literature and reviews in other languages. This may affect generalisability, but doing so seldom affects conclusions from meta-reviews (unlike reviews of primary studies; Ganann et al., 2010), and we excluded no reviews on the basis of this criteria (see Figure 1). This is likely because unpublished reviews of charitable donations are less likely to use systematic search and synthesis methods. Nevertheless, there may

be other reviews that contribute to this discussion that were missed by our searches and inclusion criteria.

Our review used well validated assessments of certainty (i.e., GRADE) and review quality (i.e., an abbreviated AMSTAR2 checklist; see Supplementary File 1). These assessments allow interested readers to know the quality of the included reviews and certainty of the included findings. However, in a meta-review, these tools are again beholden to the methods of the included systematic reviews. For example, GRADE reduces the certainty of the findings if there are few randomised experiments, or if the included randomised experiments may have been subject to common experimental biases (e.g., if they were unblinded). These biases reduce the internal validity of the findings, but few included reviews formally assessed these biases. As a result, we could not conduct sophisticated assessments of the internal validity of the included without examining the methods of the 1,339 primary studies. We hope future systematic reviews of primary studies more frequently assess these biases using a validated tool, like ROB2 (Sterne et al., 2019). Similarly, GRADE accounts for the external validity of the included studies—such as whether or not findings are likely to generalise to the populations or situations most practitioners are interested in. This can be a complex question requiring judgement. For example, in some cases Mechanical Turk contractors may be representative samples, but external validity also depends on the design of the study (e.g., viewing a real advertisement vs. playing an economic game). Our ability to assess external validity was subject to the quality of the reporting in the included systematic reviews (unless we wanted to review all 1,339 methods). We hope future reviews discuss the external validity of their included studies, and could consider integrating those judgements into their own certainty assessment (e.g., via GRADE). Another

approach would be to assess the facilitators and barriers of successfully delivering a pilot-tested intervention to new populations and in new contexts (e.g., scale up; Saeri et al., 2021)..

One additional limitation concerns the intervention of tax deductibility (Peloza & Steel, 2005). This systematic review and meta-analysis investigated the impact of tax deductibility on charitable donations primarily in the United States, with a minority of included primary studies describing the effect in similar countries such as Canada and the United Kingdom. Given that formal tax structures and cultural values of taxation and charitable giving differ significantly between countries, and tax policy can vary over time within a given country, the substantial effect size observed in Peloza and Steel's (2005) meta-analysis may not hold in other settings.

Conclusion

Increasing charitable donations could benefit society in a multitude of ways: from helping to address global poverty, health, animal suffering, climate change, human rights, and the long-term future of humanity. As a result, identifying robust strategies for promoting charitable causes can have widespread social benefits. Providing good review-level evidence is a key way that charity science can contribute to evidence-informed decision-making in this important area.

In this meta-review, we synthesised multidisciplinary literature on how to promote charitable donations. We identified a range of strategies that may increase donations and some mechanisms that may help explain their effects. These findings suggest that organisations can solicit more money by focusing on individual victims, increasing the publicity of donations, discussing the impact of the donation, and both ensuring and promoting the tax-deductibility of their charity.

Future reviews into other interventions—particularly those conducted outside of contrived experimental settings—would allow researchers and practitioners to assess the

ecological validity of those interventions. Readers could have more faith in those reviews if they more consistently followed best-practice approaches to systematic reviews. Our meta-review reveals patterns and gaps within the current research, but it also identifies an array of well researched mechanisms for promoting charitable donations. Using the findings of these reviews may increase the funds directed to some of the most important and neglected problems facing humanity.

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Supplementary File 1. Internal and external validity assessment for included reviews

Quality Appraisal of the Included Reviews

We assessed the quality of the included reviews using an abbreviated list of quality criteria drawn from AMSTAR 2 (Shea et al., 2017). The full AMSTAR2 tool was developed on the basis of a scoping review of tools for assessing the quality of systematic reviews, followed by iterative workshops with content experts (Shea et al., 2017). This abbreviated list has been used to assess core quality requirements for marketing systematic reviews, such as those discussed by Palmatier and colleagues (2018): focused question, comprehensive search, clear inclusion/exclusion, duplicate screening, duplicate quality assessment, presentation of each included study, assessment of heterogeneity, and assessment of publication bias. These quality assessment items are judged to be the most important in assessing the reliability and validity of systematic reviews (National Heart, Lung, and Blood Institute [NHLBI], n.d.) and deliberately omit AMSTAR 2 criteria that are unlikely to be relevant in marketing (e.g., searching trial registries). The 'comprehensive search' criteria assessed whether the search strategy was likely to find the majority of studies meeting inclusion criteria. The 'clear inclusion/exclusion' criteria assessed the reproducibility of the systematic review's eligibility criteria. The 'duplicate screening' and 'duplicate quality assessment' criteria assess whether tasks prone to consequential errors or judgement are done in duplicate. The 'presentation of each included study' criteria assessed the transparency of the results from the systematic review, used to inform conclusions. Finally, the 'assessment of heterogeneity' and 'assessment of publication bias' criteria assessed how well the reviews accounted for these two sources of uncertainty in conclusions. Low quality reviews were kept in this meta-review but used to qualify the certainty of the findings.

Results from our quality appraisal are available in Supplementary Table S1. All reviews except two asked a focused question and presented each study included in the review (usually through a Characteristics of Included Studies table). Most (16/21) clearly specified their inclusion criteria and over half conducted a comprehensive search (14/21). Only two clearly described duplicate screening, and only one review clearly described duplicate quality assessment (Jung et al., 2020). This quality assessment critiqued an important area (blinding) but omitted all other key threats to internal validity (e.g., selective reporting; Higgins et al., 2011). Half of the reviews tested for publication bias (10/21) and fifteen explicitly assessed heterogeneity.

Supplementary Table S1

Results From Quality Appraisal of the Included Reviews

Review	Focused question	Inclusion prespecified	Comprehensive search	Duplicate screening	Duplicate quality assessment	All studies described	Publication bias assessed	Heterogeneity assessed
Andrews et al., 2008	Yes	Yes	Yes	NR	NA	Yes	Yes	Yes
Bolkan & Rains, 2017	Yes	Yes	No	NR	NA	Yes	No	No
Bradley et al., 2018	Yes	Yes	Yes	NR	NA	Yes	Yes	Yes
Butts et al., 2019	Yes	Yes	Yes	Yes	NA	Yes	No	No
Coyne et al., 2018	Yes	Yes	Yes	Yes	NA	Yes	Yes	Yes
de Wit & Bekkers, 2017	Yes	Yes	No	NR	NA	Yes	No	Yes
Engel, 2011	No	No	No	No	NA	No	No	Yes
Feeley et al., 2012	Yes	Yes	Yes	No	NA	Yes	Yes	Yes
Fromell et al., 2020	Yes	Yes	No	NR	NA	Yes	No	Yes
Jung et al., 2020	Yes	Yes	Yes	NR	Yes	Yes	Yes	Yes
Larney et al., 2019	Yes	Yes	Yes	NR	NA	Yes	Yes	Yes
Lee et al., 2016	Yes	Yes	Yes	NR	NA	Yes	No	Yes
Lee & Feeley, 2017	Yes	Yes	Yes	NR	NA	Yes	Yes	Yes
Lu, 2016	Yes	Yes	Yes	NR	NA	Yes	Yes	Yes
Nettle et al., 2013	Yes	No	No	NR	NA	Yes	No	No
Northover et al., 2017	Yes	Yes	Yes	NR	NA	Yes	No	Yes
Peloza & Steel, 2005	Yes	Yes	Yes	NR	NA	Yes	Yes	No
Rand et al., 2016	Yes	No	CD	NR	NA	Yes	Yes	Yes
Salido-Andres et al., 2020	No	No	Yes	NR	NA	No	No	No
Sparks & Barclay, 2013	Yes	No	CD	NR	NA	Yes	No	No
Xu & Huang, 2020	Yes	Yes	Yes	NR	NA	Yes	No	Yes

Note. NR = not reported, CD = Cannot determine, NA = Not applicable

Certainty Assessment

Where quality assessment considers each review separately, certainty assessment

considers the quality of the evidence across all evidence for each combination of intervention

and outcome (Guyatt et al., 2011; Higgins et al., 2019; Hultcrantz et al., 2017). The best-practice

method of certainty assessment is the GRADE approach (Guyatt et al., 2011; Higgins et al.,

2019; Hultcrantz et al., 2017). GRADE does not assess the size of an effect, per-se, but the

confidence readers should have in the findings. The method considers both internal and external

validity of the evidence for the intervention. A series of randomised experiments is given a rating

of 'high certainty', but confidence is downgraded for one of five reasons (Guyatt et al., 2011;

Hultcrantz et al., 2017): high risk of bias among the randomised experiments, high risk of

publication bias, imprecise findings (usually indicated by wide confidence intervals),

inconsistency (usually indicated by high unexplained heterogeneity), and indirectness (i.e., low

external validity). Studies can also be upgraded for having large effect sizes (so biases would

seldom negate the benefit), a dose-response gradient where more of the intervention leads to

better results, and where any residual confounding would lead to increased rather than decreased

effects (Guyatt et al., 2011; Hultcrantz et al., 2017). While this method is seldom used in

marketing, it answers a key question practitioners and researchers want to know: how confident

should I be in this effect? The criteria are drawn from meta-reviews of experimental biases that

have been shown to add uncertainty to effect sizes, usually in the direction of inflating reported

effects (Guyatt et al., 2011; Hultcrantz et al., 2017).

Certainty Assessments

Our certainty assessment (GRADE, Hultcrantz et al., 2017) found key threats to internal

and external validity of the interventions reported in the included reviews, which reduce our

certainty in all reported effects (see Supplementary Table S2). One intervention received a GRADE of 'low' ("The true effect might be markedly different from the estimated effect") because the effect sizes were large enough that the threats to internal and external validity would seldom eliminate effects entirely (pique technique; Lee & Feeley, 2017). All other interventions received a GRADE of 'very low' ("The true effect is probably markedly different from the estimated effect").

Supplementary Table S2

GRADE Table with Pooled Effect for Each Intervention and Confidence in that Effect Size Estimate (GRADE) from High to Very Low

Intervention	Outcome	*r* with 95% CI	GRADE	Design	Risk of Bias	Imprecision	Inconsistency	Indirectness	Publication Bias	Large Effect
Crowding out	Donation revenue	Uncertain	Very low	Both experimental and non-experimental studies	NA	Wide CIs and divergent results for experimental and non-experimental studies	Large between-study standard deviation (often >= effect size)	Mostly field experiments	Not assessed	No $|r| < 0.3$
Door in the face	Compliance	0.06 [-0.01, 0.12]	Very low	Apparently experimental studies	NA	Wide confidence intervals for monetary donations	Significant unexplained heterogeneity	About half of the studies involved students with smaller effects in non-student populations	Assessed and low risk	No $|r| < 0.3$
Gain-framed messages	Donation size	-0.01 [-0.09, 0.07]	Very low	Randomised experiments	NA	Narrow CI	Large between study heterogeneity (88.47%)	Mostly field experiments (26/40) with no significant difference in pattern.	Not assessed by established methods; methods used indicated presence of bias	No $|r| < 0.3$
Identifiable victim	Donation size	0.13 [0.08, 0.17]	Very low	Could be either randomised or quasi-experimental; proportion not reported	NA	Narrow CI	Moderate unexplained heterogeneity (53%)	Approximately 3 of 40+ studies were field experiments, the rest conducted in laboratories	Not assessed	No $|r| < 0.3$
Legitimizing paltry contributions	Compliance	0.22 [0.17, 0.26]	Very low	Randomised experiments	NA	Wide CI ranging from no effect to	Significant heterogeneity for compliance	Only 2/17 studies conducted in lab	Not assessed	No $|r| < 0.3$

Intervention	Outcome	r with 95% CI	GRADE	Design	Risk of Bias	Imprecision	Inconsistency	Indirectness	Publication Bias	Large Effect
						possibly very harmful				
	Donation size	-0.14 [-0.22, -0.06]	Very low	Randomised experiments	NA	Wide CI ranging from no effect to possibly very harmful	No significant heterogeneity for donation size	Only 2/30 studies conducted in lab	NA	No |r| < 0.3
Observability (artificial)	Compliance	0.04 [0.03, 0.06]	Very low	Randomised experiments	NA	Narrow CI	No significant heterogeneity for compliance	Some field experiments but most in lab and no moderation conducted	NA	No |r| < 0.3
	Donation size	0.01 [-0.02, 0.05]	Very low	Randomised experiments	NA	Narrow CI	Significant heterogeneity for donation size	Some field experiments but most in lab and no moderation conducted	NA	No |r| < 0.3
Observability (real)	Donation size	0.15 [0.11, 0.20]	Very low	73% experimental studies	NA	Narrow CI	Large heterogeneity (99.24%) that appears unexplained	Most studies conducted in laboratories (~99/134) with much lower effects from field experiments	Assessed and low risk	No |r| < 0.3
Pique	Compliance	0.27 [0.19, 0.35]	Low	Randomised experiments	NA	Narrow CI	Significant unexplained heterogeneity	Only 15/17 were field experiments but all were trivial amounts of money (<$3)	Assessed and low risk	Yes |r| ~= 0.3
	Donation size	0.29 [0.25, 0.33]	Low	Randomised experiments	NA	Narrow CI	NA	Only 15/17 were field experiments but all were trivial amounts of money (<$3)	Assessed and low risk	Yes |r| ~= 0.3

Intervention	Outcome	r with 95% CI	GRADE	Design	Risk of Bias	Imprecision	Inconsistency	Indirectness	Publication Bias	Large Effect
Promoting intuition instead of deliberation	Donation size	-0.01 [-0.02, 0.01]	Very low	Randomised experiments	NA	Narrow CI	Difficult to assess as described	Unclear, presumed to be mostly laboratory experiments	NA	No $\lvert r \rvert < 0.3$
Prosocial media	Donation size	0.09 [-0.04, 0.21]	Very low	Mostly experimental studies (57/77)	NA	Wide CI ranging from no effect to possibly very helpful	Large unexplained heterogeneity (77.90%)	Most appear to be in laboratory settings	Assessed and present, not corrected for in analyses	No $\lvert r \rvert < 0.3$
Prosocial modelling	Donation size	0.22 [0.21, 0.24]	Very low	Randomised experiments	21/88 studies were blinded with similar effect sizes	Narrow confidence interval	Large between study heterogeneity (73.2%)	Mostly lab experiments (65/88) with some field and online studies, with larger effects in the lab	Assessed and present but corrected for in analyses	No $\lvert r \rvert < 0.3$
Tax deductibility	Price elasticity	-1.44 [NR, NR]	Very low	Observational data	NA	Very wide standard deviation, CI not reported	NA	Largely field data	Assessed and low risk	No $\lvert r \rvert < 0.3$

Note: No effects had robust dose-response gradients (upgrade criteria #2) or appeared to be in a context where residual confounding would have increased effects (upgrade criteria #3), so we omitted those columns. NA = Not assessed.

Supplementary File 2. Contexts Mapped by the Included Reviews

The included reviews synthesised research addressing charitable donations in diverse ways (see Supplementary Table S3). Many explored how variations in economic games influenced donation. Many also found a number of studies conducted in the field, but usually only included small donations. We mapped the contexts examined by the various reviews by context, channel, and persuasion methods (Lasswell, 1948; Slattery et al., 2020).

Supplementary Table S3

Review Context Categorization: Who used What Method and Channel, Who Received It, How Was the Outcome Assessed, and How Was the Data collected?

Who	Method of persuasion	Bekkers & Wiepking (2011b) Mechanism	Channel of communication	Receiver	Outcome measured	Data collection context(s)
Andrews et al., 2008	Encouraging even small requests for donations ('legitimizing paltry contributions')	Costs and benefits	Almost exclusively spoken/face-to-face (one study via mail)	Individuals, presumably adults	One off donation	Usually in public or participant's home
Bolkan & Rains, 2017	Small requests for donation/Paltry contributions	Costs and benefits	Spoken/Face-to-face	Individuals, presumably adults and students predominantly	One off donation	Experimental; otherwise not specified or implied.
Bradley et al., 2018	Any form of observation by others	Reputation	Various, including overt observation (e.g., bystander), pseudo-observation (e.g., post-hoc audit) or perceived observation (e.g., watching eyes)	Both individuals and groups, across a range of ages	Either one-off or repeated monetary donation	Both lab based (75%) and field (25%)
Butts et al., 2019	Showing one victim versus showing many victims	Awareness	Not specified or implied	Individuals, presumably adults and students	Monetary donations and donations of goods	Experimental; usually lab studies
Coyne et al., 2018	Exposure to prosocial media: media showing voluntary behaviour intended to benefit another, excluding where violence was involved	Efficacy	TV, movies, video games, music, or music videos	Individuals, differentiated by sex and age	Donating to an unspecified target	Experimental, cross sectional, longitudinal

Who	Method of persuasion	Bekkers & Wiepking (2011b) Mechanism	Channel of communication	Receiver	Outcome measured	Data collection context(s)
de Wit & Bekkers, 2017	Providing government support for non-profits	Altruism	Not specified or implied	Presumably tax paying American adults	Donation from individuals to non-profits	Four types: laboratory experiments, survey experiments, archival (financial information) data, and micro-level survey data.
Engel, 2011	Compared variations of dictator game; differentiated by donor characteristics (e.g., age, ethnicity), recipient characteristics (e.g., 'deserving', social distance) and contextual manipulations (e.g., action space, real money used or not, certainty of benefit).	Efficacy, Reputation, Awareness, Costs and Benefits, Other	Not specified, method implies that online and face-to-face were used	Individuals differentiated by number (one or more), race, age (old, middle, student, old), student status (student or not), deservingness of reward (earned or not earned).	Money offered to other player(s)	Not specified, but methods and references imply lab and online experiments.
Feeley et al., 2012	Sequential request (e.g., door in the face, big followed by small ask, or repeated ask for same outcome); Differentiated by whether there was a reduction in original request or not, and whether there was a delay in the follow up or not	Costs and Benefits	Differentiated: Telephone/Online /Written or Face-to-Face	Adults, differentiated into students, non-students, and mixed sample	Donations differentiated by type (Monetary, Research/Volunteer, Personal health behaviour, Miscellaneous), Prosocialness (prosocial, not prosocial) and delay in measurement (immediate, delayed)	Not specified, references suggest a mix of lab and field experiments

Who	Method of persuasion	Bekkers & Wiepking (2011b) Mechanism	Channel of communication	Receiver	Outcome measured	Data collection context(s)
Fromell et al., 2020	Adding time pressure, parallel tasks, tiring tasks, or priming them to use intuition.	Other	Not specified or implied	Individuals, usually adults, often students or Amazon Mechanical Turk participants	Donations to charities or other participants ('players')	Experimental; usually lab studies
Jung et al., 2020	Offering a range of prosocial models	Efficacy	Either direct observation or via audio or visual materials	All ages (children, school-age, adult)	'Material help' (donating money or tokens [in the case of children])	Experimental studies, conducted in labs, in the field, and online
Larney et al., 2019	Variation in stake sizes	Costs and Benefits	Face-to-face apart from one online study	Individuals, presumably adults and mostly students, Western, Indian, and Chinese samples were also used (undifferentiated)	Money offered to other player(s)	Dictator and ultimatum games; differentiated by whether repeated measures were used; lab and online experiments
Lee et al., 2016	Making small requests for donation / Paltry contributions; also coded for use of other techniques (normative information, pre-giving, dialogue induction, initial request of a small or large favour), also coded for whether phase used was identical to "even a penny will help", or a variant	Costs and Benefits	Face-to-face interaction, mediated channels (written mail or scenario, telephone), or mixed methods	Individuals differentiated by country (United States, Non-United States), sex (male, female, both) and age (student, adult)	Donation: Categorized by (money, product, time), topic (health, poverty, animal protection; social/educational event) and time of action (immediate donation or pledge)	Experiments in a subject's home, a public place, or a laboratory
Lee & Feeley, 2017	Requesting an odd donation amount (17c vs. 10c)	Awareness	Not specified or implied	Mostly adult samples (15/17) with some students (2/17)	Small monetary donations (1 study measured time, which we did not extract)	Mostly field studies (15 of 17)

Who	Method of persuasion	Bekkers & Wiepking (2011b) Mechanism	Channel of communication	Receiver	Outcome measured	Data collection context(s)
Lu, 2016	Effect of giving grants to non-profit organisations on individual donors	Altruism	Not specified or implied	Individuals, corporations, and foundations, differentiated by sector (arts, education and research, environment, health care, human services, international development, and public benefit), country (US v Non-US) and organisational characteristics (age and size)	Donations to non-profit by individuals, corporations, and foundations	Analysis of secondary data
Nettle et al., 2013	Watching eyes during donation opportunity	Reputation	Not specified, method implies that online and face-to-face were used	Individuals, presumably adults and mostly students (undifferentiated)	Money offered to other player(s)	Dictator game, references imply lab and online experiments
Northover et al., 2017	Artificial surveillance cues (resembled a watching face or eyes; generally, photographs or stylized images of eyes)	Reputation	Not specified, method implies that online and face-to-face were used	Individuals, presumably adults and mostly students (undifferentiated)	Generosity: giving material resources to others, for reasons other than direct reciprocity, without expecting anything from those others in return	Social discounting tasks, economic games, and charity donations;

Who	Method of persuasion	Bekkers & Wiepking (2011b) Mechanism	Channel of communication	Receiver	Outcome measured	Data collection context(s)
Peloza & Steel, 2005	Giving tax deductions on donations, differentiated by permanency of tax (permanent or temporary)	Costs and Benefits	Not specified or implied	Tax paying adults differentiated by income (above $100,000 in earnings and below), and itemization of charitable donations (itemizer, non-itemizer)	Private philanthropy, differentiated by type of donation (donation or bequest)	Analysis of secondary data differentiated by source type (panel or cross-sectional, and tax-filer or survey)
Rand et al., 2016	Promoting either intuition or deliberation during donation opportunity	Other	Not specified, method implies that online and face-to-face were used	Individuals differentiated by sex (male or female) and identification with sex role (male versus female) to assess interactions	Money offered to other player(s)	Dictator game, references imply lab and online experiments
Salido-Andres et al., 2020	Various methods		Online and blended (online & offline) donation-based crowdfunding campaigns	Individuals from 20+ countries	Donations to crowdfunding projects	Field studies
Sparks & Barclay, 2013	Watching eyes during donation opportunity (short v prolonged exposure)	Reputation	Face-to-face in the lab, field studies (e.g., bus stop, supermarket), and one online study	Individuals, presumably adults and mostly students	Money offered	Dictator game, references imply lab and online experiments
Xu & Huang, 2020	Gain-framed vs. loss-framed messages	Costs and Benefits	Not specified or implied	Both adults and students	Donations provided (or intention to donate)	Both lab and field experiments