The Effect of Social Distance in Donation-Based Crowdfunding

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Short Paper

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Abstract

Crowdfunding offers an innovative approach to financing projects by facilitating many individuals and organizations to contribute, often small amounts, to these projects. In the context of donation-based crowdfunding, we study how social distance affects average donations. Drawing on construal level theory, we argue that project images featuring humans reduce the social distance for donors because donors can better identify with the recipients; thus, these campaigns are more concrete, and donors give more. To test the effect of social distance using (human) project images on average donations, we conducted two studies, one observational and one experimental study. In both studies, we show that projects, whose images feature humans, receive higher donations.

Keywords: Donation-based crowdfunding, construal level theory, social distance, experiment, Bayesian analysis

Introduction

For many people and organizations in need, donation-based crowdfunding platforms provide a vital avenue for raising money, not only when they are unable to pay for unplanned, or even planned, expenses, but also when they initiate ambitious projects to help others. Crowdfunding is generally understood as the "collective effort by people who network and pool their money together, usually via the Internet, in order to invest in and support efforts initiated by other people or organizations" (Ordanini et al. 2011, p. 443). Prior research identifies four distinct types of crowdfunding (Hemer 2011): (1) reward based, in which investors receive a nonfinancial benefit, often the product itself, in return for their contribution (see, e.g., Burtch et al. 2015; Burtch et al. 2016); (2) lending based, in which investors are promised interest for their investment (see, e.g., Burtch et al. 2014; Lin and Viswanathan 2016; Zhang and Liu 2012); (3) equity based, in which investors receive a share of the profits (see, e.g., Bapna 2019); and (4) donation based, in which investors receive nothing in return for their contribution (see, e.g., Burtch et al. 2013). Our study contributes to the research stream that investigates donation-based crowdfunding, which is closely related to charitable giving.

In the context of charitable giving, many studies have already shown that the "identifiablity effect" (Schelling 1968) plays an important role in reducing the social distance between donor and recipient (Kogut and Ritov 2005a; Kogut and Ritov 2005b; Small and Loewenstein 2003; Small et al. 2007). However, the effect is not entirely clear and previous research revealed mixed findings. For example, some studies found that people give more money when friends or family members are affected (Small and Simonsohn 2008). In contrast, other studies have found no evidence for the identifiability effect (Ein-Gar and Levontin 2013; Lesner and Rasmussen 2014). In this study, we are interested in whether the identifiability effect also works in the context of crowdfunding. Drawing on construal level theory, we argue that the identifiablity effect—displaying

humans on project pictures—reduces social distance and increases donations. We conducted two studies, one observational and one experimental. Our results show that donors give more when project initiators use identifiable campaign images that feature humans. We thus not only contribute to the literature on construal level theory by applying and replicating the theory in a new context but also to the emerging literature on crowdfunding by showing how to improve the design of campaigns to increase donations.

Theory & Hypotheses

Construal level theory (Trope and Liberman 2003; Trope and Liberman 2010) states that people's mental representation of objects—including social phenomena like crowdfunding campaigns—plays a crucial role in their evaluation of those objects (Dhar and Kim 2007; Huang et al. 2016; Trope and Liberman 2007). In particular, people may conceptualize objects as either abstract or concrete depending on various dimensions of psychological distance (i.e., social, spatial, temporal, and hypothetical distance). People think abstractly about objects that have higher psychological distance (higher construal level), whereas they think more concretely about objects that feel closer (lower construal level). The level of construal also influences decision-making: If people engage in high-level, abstract thinking, they tend to see the big picture (i.e., the "why") but do not necessarily act; if they engage in low-level, concrete thinking, they focus on the details (i.e., the "how") and are more likely to act (Trope and Liberman 2003).

In this paper, we focus on social distance. We argue that in the context of donation-based crowdfunding, people donate more when social distance is low, because they think in concrete terms about a project and are more likely to act, that is, donate. Social distance is closely linked to the identifiability effect (Small and Loewenstein 2003): Social distance is smaller if a recipient is "identifiable" rather than a "statistical" number (Kogut and Ritov 2005b). In the context of donation-based crowdfunding, we propose that campaigns whose project images feature identifiable humans receive more donations than campaigns whose project images show no humans at all. In addition, we hypothesize that campaigns whose project images contain individuals receive more donations than campaigns whose project images contain a group of humans, as it is easier to identify with an individual rather than a group of humans (Kogut and Ritov 2005a):

Ha: People donate more to campaigns whose project pictures feature humans.

Hb: People donate more to campaigns whose project pictures contain individuals than they do to campaigns whose project pictures contain a group of humans.

Method

Overview

In order to analyze how social distance affects donation behavior, we conducted two studies. In the first, an observational study, we analyzed project pictures of a real donation-based crowdfunding platform; in the second study, an experiment, we replicated the results of the first study in a controlled environment (see Table 1 for an overview).

Table 1. Overview of Studies.

Study	Purpose	Sample	Findings
1	*Observational study*: Investigate whether social distance influences donation behavior	631 DonorsChoose projects	Project pictures with humans increase donations.
2	*Experimental study*: Test whether social distance influences donation behavior	311 Prolific workers	Project pictures with humans increase donations.

Study 1: Observational Study

Dataset & Measures

We gathered data from www.donorschoose.org, a donation-based platform for supporting classrooms, which provides an API to download the data. In total, we selected 1,000 random projects, 342 of which contained incomplete data (e.g., missing information about donors). We removed extreme outliers, that is, those more than six sigma away from the mean donation (four observations), leading to a final sample of 631 projects.

Our dependent variable is *Donation*, that is, the number of US$ donated to a certain project *i* (i.e., a discrete nonnegative variable). Our independent variable is *Social Distance*, a variable with three levels/conditions, indicating whether a project uses a picture (1) without humans, (2) with one human, or (3) with a group of humans. We used a human coder (who did not belong to the author team) to manually categorize the project images according to these criteria.

Model Specification

Because our dependent variable, *Donation*, is discrete and bounded at zero and follows a Poisson distribution, we used a Poisson regression to estimate the effect of the conditions on *Donation* (see also Thomas and Kyung 2019):

$$\begin{aligned} Donation_i \sim & Poisson(\lambda_i) \\ \log \lambda_i = & \alpha + \beta \cdot Condition_i \\ \alpha \sim & Normal(0, 100) \\ \beta \sim & Normal(0, 1) \end{aligned} \tag{1}$$

We estimated the model using a fully Bayesian approach implemented in *Stan* (http://mc-stan.org/) and *R* (Ihaka and Gentleman 1996). We used only weakly informative priors (as suggested by McElreath (2016)) and ran four chains with 4,000 iterations (warmup was 2,000). The diagnostics show that the four chains were well-mixed ($\hat{R} < 1.1$) (Gelman and Rubin 1992) and efficient (effective sample size > 1, 000).

Results & Discussion

Table 2 presents both the descriptives and estimates of the different conditions (no humans, one human, and group). Projects whose images feature no humans are on average supported with only $378, whereas projects whose images contain one or more humans are supported with $427 and $404, respectively.

The model's estimates are quite close to the empirical observations: in the no-human-pic condition, it estimates an average donation of $377.54 (± $1.87); in the one-human-pic condition, an average donation of $426.97 (± $5.97); and in the group-pic condition, an average donation of $403.75 (± $2.96). The main effects—the differences between treatment conditions and the no-human condition—are well above zero and thus significant: using a picture with one human increases donations by $49.43 (± $6.26), and using a group picture increases donations by $26.21 (± $3.53). Thus, these results support our first hypothesis (Ha): donors give more if presented with a picture featuring human(s). In addition, we tested whether people donate significantly more when presented with a picture containing one-human than they do when presented with a group picture (Hb). The difference between the two conditions is $23.17 (± $6.46), which is well above zero, so the results also provide supporting evidence for our second hypothesis (Hb).

Taken together, the results show that the type of project image strongly influences donation behavior. On average, projects that use images featuring humans receive more donations (see Table 2). Interestingly, the majority of projects (65%) use images without humans. One limitation of this study, however, is that it is correlational and probably not causal. It is possible that donors self-selected themselves and were more attracted to certain project images (for example, the gender of the donor may have influenced the donation amount based on the gender of the person/people shown in the photos). Another limitation is that we did not control for other influences such as the images' background; people might donate more if a project image

Table 2. Results of Study 1 (Descriptives and Estimations per Condition).

Condition	Description	Mean (SD)	Estimate	95% CI
(1)	No humans	377.51 (292.36)	377.54	375.67–379.35
(2)	One human	426.85 (398.34)	426.97	421.00–433.00
(3)	Group	403.72 (327.15)	403.75	400.76–406.81
(2)–(1)	Main effect$_{human}$ (diff. human to no humans)		49.43	43.17–55.63
(3)–(1)	Main effect$_{group}$ (diff. group to no humans)		26.21	22.68–29.78

Notes: The table shows the observed and estimated donations per condition (in USD); in addition, it shows the main effect of each treatment condition (one human and group picture) compared to the no-human condition.

shows a poor, rural area. In order to eliminate these effects, we conducted an experimental study in which we randomly assigned participants to different conditions (i.e., projects with different project images).

Study 2: Experimental Study

Study 2's purpose was to replicate Study 1 in a controlled environment. For this purpose, participants were randomly assigned to condition with different project images. In a pilot study, we first evaluated the project images, which we then used in the main experiment.

Pilot Study

Material. In a pilot study, we took pictures of (1) a female student, (2) a male student, (3) a group of students, and (4) a classroom without humans, keeping the background constant for all pictures (see Figure 1). We then had the pictures evaluated by an online panel regarding empathy and emotional arousal. We expected both to be higher for pictures displaying humans.

Figure 1. Project Pictures.

Measures. To measure empathy, we used the empathic concern index (proposed by Coke et al. (1978)), in which participants had to evaluate the images using five adjectives—empathic, concerned, warm, compassionate, softhearted—on a 9-point Likert scale. To measure emotional arousal, we used the self-assessment manikin (SAM) measurement (proposed by Bradley and Lang (1994)), in which participants had to rate the images using emotional arousal icons on a 9-point Likert scale (Figure 2).

Participants. Using Prolific, in January 2019 we recruited 100 participants from the United States who were over 18 years of age. The mean age was 35.5 years, and 50% were women. Because participants were asked to rate all four pictures—containing a male, containing a female, containing a group, and with no humans—we had a repeated measures design, with a total of 400 observations.

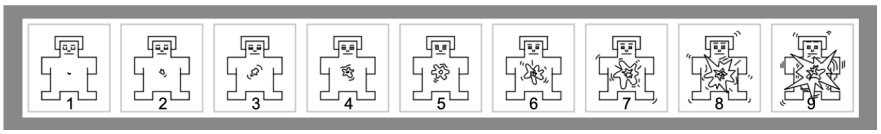

Figure 2. SAM Arousal Scale.

Model Specification. To account for the fact that participants evaluated multiple images, we used a linear mixed effects model to estimate the response variable y (either empathic score or emotional arousal score) based on the four image conditions. In particular, the model allows the intercept to vary by participant:[1]:

$$\begin{aligned} y_i \sim & Normal(\mu_i, \sigma) \\ \mu_i = & \alpha_{participant_i} + \beta \cdot Condition_i \\ \alpha_{participant} \sim & Normal(\alpha, \sigma_\alpha) \\ \alpha \sim & Normal(0, 10) \\ \sigma_\alpha & HalfCauchy(0, 1) \\ \beta \sim & Normal(0, 10) \\ \sigma \sim & Uniform(0, 50) \end{aligned} \tag{2}$$

Results. The results show that images featuring humans were consistently rated higher in terms of empathy and arousal (compared to a picture showing no humans, i.e., the intercept). Nevertheless, we did not observe any clear difference between the images featuring an individual human and the image featuring a group; the female image was rated *slightly* higher and the male image slightly *lower* than the group image (see Table 3).

Table 3. Results of Pilot Study.

	(1) Empathy		(2) Arousal	
	Estimate	95% CI	Estimate	95% CI
Intercept (No humans)	1.70	1.37–2.05	2.77	2.38–3.17
Condition (Female)	2.56	2.24–2.88	1.68	1.32–2.04
Condition (Male)	1.96	1.65–2.28	1.08	.79–1.46
Condition (Group)	2.41	2.09–2.72	1.68	1.25–1.98
$\sigma_{residual}$	1.14	1.05–1.23	1.32	1.22–1.43
$\sigma_{participant}$	1.27	1.07–1.50	1.51	1.28–1.79
N	400		400	

Materials and Procedure

Materials. On the basis of a real DonorsChoose campaign,[2] we developed our own campaign in which an instructor of a journalism class asked for donations for a MacBook (Figure 3). As project pictures, we used those evaluated in the pilot study. All materials were developed in Qualtrics.

Procedure. After the participants read the instructions for the experiment, they were redirected to the campaign page. We instructed them to read the campaign details carefully because their further participation was based on them answering a few questions correctly (e.g., What was the subject of the class—journalism,

[1]As in Study 1, we estimated the models using a fully Bayesian approach. We used only weakly informative priors (as suggested by McElreath (2016)) and ran four chains with 2,000 iterations (warmup was 1,000). The diagnostics show that the four chains were well-mixed ($\hat{R} < 1.1$) (Gelman and Rubin 1992) and efficient (effective sample size > 1, 000).

[2]https://www.donorschoose.org/project/macbook-air-for-the-students/678146/

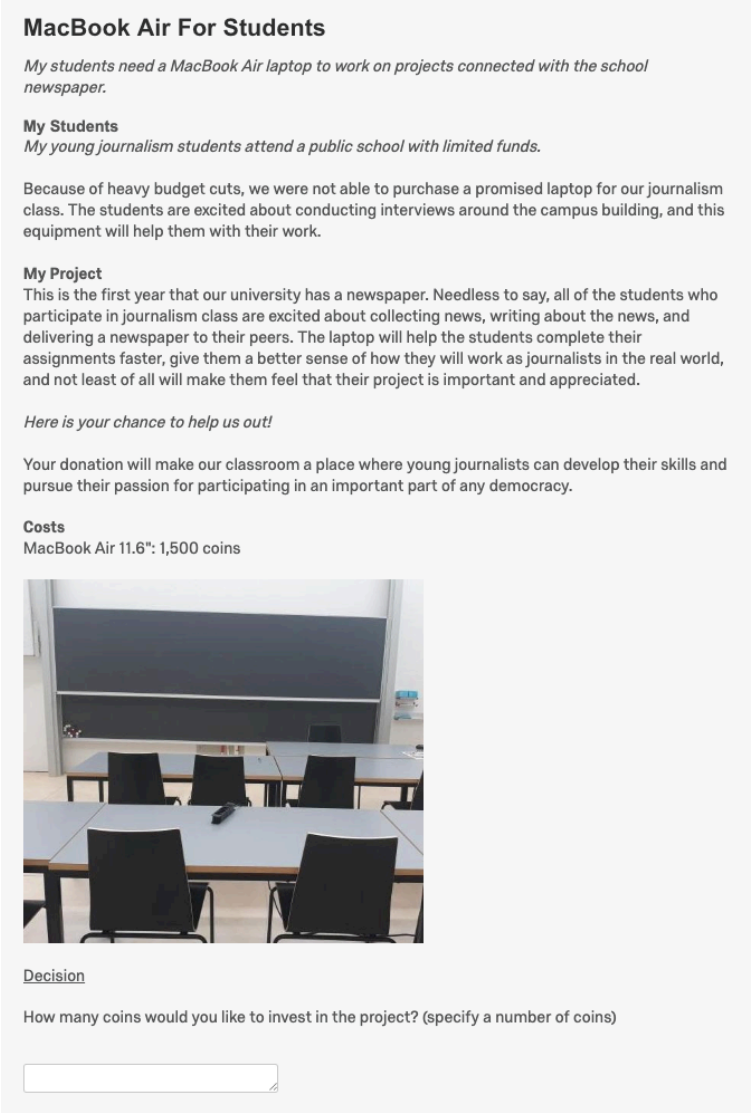

Figure 3. Fictitious Donation-Based Crowdfunding Campaign.

economics, or architecture?). After the participants read the campaign page, we asked them for a voluntary donation. For this purpose, we provided them with an endowment of 100 coins, the currency in the experiment. Coins not donated (100 coins – donation) could be kept as bonus payment (exchange rate was 100 coins = 100 pence). In order to provide an incentive for the participants to donate at all, we informed them that we would forward their donation to a real DonorsChoose project (what we actually did, see Footnote 4). After the experiment, we asked for demographic data and debriefed the participants.

Measures and Conditions

The response variable was the number of coins donated by a participant, that is, a discrete nonnegative variable. We tested a total of four conditions by displaying different project images below the campaign page (see Figure 3): (1) a picture without humans, (2) a picture featuring a female, (3) a picture featuring a male, and (4) a picture featuring a group (see Figure 1).

Participants

Using Prolific, in March 2019 we recruited 400 U.S.-based participants (100 per condition) who were over 18 years of age. We paid the participants £1 (about US$1.25) to perform a 10-minute task, which corresponds to an hourly wage of £6 (about US$7.50). In addition, we paid the participants a bonus payment depending on the donation decision they made in the experiment (described above). We removed observations from participants who could not answer an attention-check question about the subject of the class (i.e., journalism) and who donated their entire budget. The rationale for the latter is that due to the design of the experiment (upper bound at 100 coins for economic reasons), we have censored data, heavily biasing the donation distribution at the upper end at 100 coins. For participants who donated 100 coins, however, we cannot ascertain how much they were actually willing to donate—some may have given even 1,000 coins if that had been an option. In order not to bias the donation distribution at 100 coins, we excluded from the analysis participants who donated 100 coins (truncated the data). Without the 100-coin participants, the distribution is similar to that of Study 1.[3] After applying this procedure, we had a final sample size of 311 (mean age: 34.9 years, 49% women). Participants were randomly assigned to one of four conditions using Qualtrics Randomizer: (1) no-human pic: 76, (2) female pic: 80, (3) male pic: 78, and (4) group pic: 77. A randomization check revealed no significant differences in the demographic data between the groups.[4]

Results & Discussion

Table 4 presents both the descriptives and model estimations by condition. On average, participants presented with a picture with no humans donated 18.76 coins; those presented with a female picture donated 22.01 coins; those presented with a male picture donated 25.74 coins; and those presented with a group picture donated 24.12 coins. Interestingly, although participants in the pilot study rated the female picture as more empathic (4.26 out of 9) than the male picture (3.66), participants in the main experiments donated more to the project whose picture featured a male person.

The model's estimates are again quite close to the empirical observations: in the no-human condition, it estimates an average donation of 18.77 coins (± 0.98 coins); in the female-pic condition, an average donation of 22.02 (± 1 coin); in the male-pic condition, an average donation of 25.73 coins (± 1.11 coins); and in the group-pic condition, an average of 24.10 coins (± 1.06 coins). The main effects—the differences between the treatment conditions and the no-human condition—are well above zero and thus significant: using a female picture increases donations by 3.25 coins (± 1.40 coins); using a male picture increases donations by 6.97 coins (± 1.50 coins); and using a group picture increases donations by 5.34 coins (± 1.49 coins).

Table 4. Results of Study 2 (Descriptives and Estimations per Condition).

Condition	Description	Mean (SD)	Estimate	95% CI
(1)	No humans	18.76 (20.55)	18.77	17.79–19.75
(2)	Female	22.01 (20.96)	22.02	21.02–23.07
(3)	Male	25.74 (26.76)	25.73	24.62–26.86
(4)	Group	24.12 (22.99)	24.10	23.04–25.18
(2)–(1)	Main effect$_{female}$ (diff. female to no-human)		3.25	1.85–4.67
(3)–(1)	Main effect$_{male}$ (diff. male to no-human)		6.97	5.47–8.49
(4)–(1)	Main effect$_{group}$ (diff. group to no-human)		5.34	3.85–6.79

Notes: The table shows the observed and estimated donations per condition (in coins); in addition, it shows the main effect of each treatment condition (female, male, and group picture) compared to the no-human condition.

The results of the experiment are consistent with those of the empirical study. Project images depicting humans lead to higher donations. Thus, the results support our first hypothesis (Ha). However, we did not

[3] As a robustness check, we also used a hurdle model, that uses the full dataset and models two distinct data generating processes, one for the participants who donated their entire budget, that is 100 coins, and one for the other participants. The results remain unaffected. Results are available upon request.

[4] In total, participants donated £77.08 (US$ 97.07) in the experiment, money which we forwarded to a real DonorsChoose project. We donated the money to the following project: https://www.donorschoose.org/project/more-stem-in-the-classroom/3989296/

observe any difference between the pictures featuring one human (female or male) and the picture featuring a group, which could be due to the fact that participants found it easy to identify with the individual humans pictured in the relatively small group.

General Discussion

This study contributes to the growing literature on crowdfunding and charitable giving. To the best of our knowledge, this is the first study to analyze social distance in the context of donation-based crowdfunding. Starting with social distance, we showed that social distance significantly influences the amount people are willing to donate. In our future research, we also plan to manipulate spatial, temporal, and hypothetical distance. For these experimental studies, we have already created the designs and carried out the first pretests. We will manipulate spatial distance by manipulating the distance to the project (low/high), temporal distance by manipulating the time of the project's launch (immediately after successful funding/one year after funding), and hypothetical distance by manipulating the probability of a project getting launched (close to funding goal/far from funding goal). These results will have important managerial implications, as they show how to design crowdfunding campaigns to increase overall donations.

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