



Research Article

# Follow the crowd: Social information and crowdfunding donations in a large field experiment

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**Abstract:** Purposely guiding human decision making with a discrete suggestion, ‘nudging’, is increasingly popular. One particularly promising nudge is to provide decision makers with information about the decisions of others, also referred to as social information. Social information is often applied in fundraising campaigns to increase individual donations. A discrete suggestion such as the donation amount of others can result in donors donating similar amounts. We examined effects of social information in a relatively new context, namely crowdfunding. Crowdfunding is a new online fundraising tool. Our study, based on a large natural field experiment ( $n = 24,070$ ), tests to what extent social information affects online donation behavior and how its effects vary throughout the duration of a campaign. We show that social information increases the individual donation amount by 17%, which is close to the average of 14% found in previous studies. However, social information did not attract more donors: the participation rate was not affected. Our study is the first to pinpoint the stage of the funding campaign at which the effect of social information is most pronounced. We found that social information is most effective in increasing donations at the beginning of crowdfunding campaigns. All materials for this article are available at <https://osf.io/epuj6/>.

Keywords: Crowdfunding, Donation behavior, Natural field experiment, Online donations, Social information

Supplements: [Open data](#), [Open materials](#), [Preregistered](#)

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Research shows that donors tend to mirror the donation amounts of others. This behavior, adjusting the donation amount to the donation behavior of others, is described as the social information effect (Shang & Croson, 2009). A recent systematic literature review (van Teunenbroek, Bekkers & Beersma, 2020) shows that donors informed about the donation amount of previous donors tend to donate higher amounts. While overall previous research tends to find positive effects of social information, its effect depends on several contextual factors. First,

prospective donors who find the amount donated by others to be excessively high may refrain from giving altogether (Croson & Shang, 2013), while an amount that is too low may lower donation amounts (Croson & Shang, 2008; Meyer & Yang, 2015). In addition, the published research shows that whether social information encourages donation behavior depends on how donors interpret it, and they may do so in different ways. Several studies suggest that social information provides donors with a norm that guides their donation behavior (Croson, Handy & Shang, 2009; Smith, Windmeijer & Wright, 2015); such that donors think that previous donations indicate a standard for what is appropriate.

We provide further evidence on the effects of social information on donation behavior in a large-scale field experiment. Our paper contributes to the literature in two ways. First, we examined the effects of stating donation amounts of earlier donors in a

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context in which it has hardly been tested before, namely crowdfunding. Crowdfunding is a new online fundraising tool that builds on small donations from a large (and mostly unknown) crowd (Mollick, 2014). Our research question is: “what is the influence of social information on online donation behavior through a crowdfunding platform?”

Second, we provide evidence on the optimal timing of social information. Crowdfunding campaigns are launched online at a platform for a specific duration. Our study is the first to pinpoint the stage of the funding campaign at which the effect of social information is most pronounced. Was social information more effective when the campaign just launched, or towards the end? An answer to this question adds further evidence to the stock of knowledge on contexts in which ‘nudges’ such as the provision of social information work.

The implications are important for practitioners since there is a need to understand possible stimulants for donating to crowdfunding projects (Zvilichovsky, Danziger, & Steinhart, 2018), as many crowdfunding projects fail to assemble enough funding. For instance, between 2014 and 2018 about two-third of the projects on one of the most popular and successful crowdfunding platforms, Kickstarter, failed to assemble the target amount (The Crowdfunding Center, 2018). Second, and more broadly, crowdfunding is a private source of income that may replace government funding for the arts. After a large cut in government funding for the arts in the Netherlands, the sector struggled financially (Blankers, Goudriaan, de Groot, Everhardt, Frierson, & Mazzola, 2012). To reduce their dependence on government funding, arts organizations are forced to acquire income from alternative sources such as donations (Algemene Rekenkamer, 2015). Our findings could be used to increase the effectiveness of crowdfunding campaigns.

To test the effect of social information, we conducted a large-scale field experiment among all visitors ( $n = 24,070$ ) on a Dutch crowdfunding platform. The experiment tested the effects of social information on donation behavior. In the treatment condition, the message “Did you know that on average donors on Voordekunst donate 82 euros?” was displayed next to the project information. This was the actual average amount donated by donors on the platform of the preceding six months. In the ‘base’

condition, there was no visible average donation amount (see appendix A for stimulus materials).

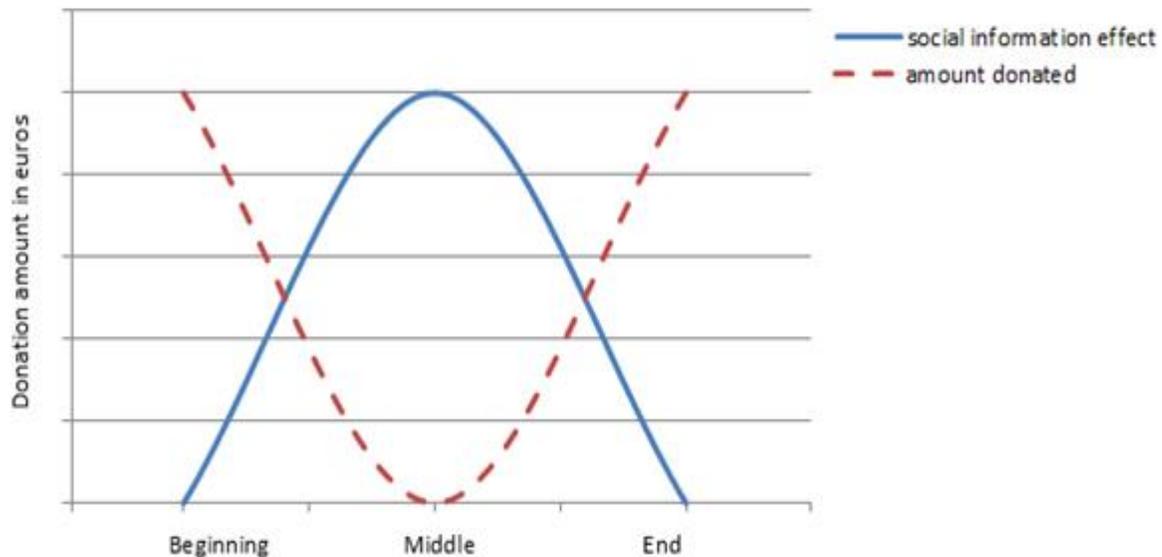
### **The Effects of Social Information in Previous Studies**

Donors adjust their charitable behavior according to social information. When individuals are presented with information on the donation amount of previous donors their donation amount increases (for example Alpizar, Carlsson, & Johansson-Stenman, 2008a; Bekkers, 2012; Edwards & List, 2013; Martin & Randal, 2008; Shang, Croson & Reed, 2012; van Teunenbroek, 2016; van Teunenbroek et al, 2020).

Only three studies (Croson & Shang, 2008; Kubo, Shoji, Tsuge, & Kuriyama; Meyer & Yang, 2015) that examined effects of social information (reviewed by van Teunenbroek et al., 2019) reported a negative effect on the individual donation amount. Four studies (Catt & Benson, 1977; Croson & Shang, 2013; Murphy, Batmunkh, Nilsson, & Ray, 2015; Shang & Croson, 2009) reported no effect: donors donated similar amounts if they did or did not know about the donation of other donors. 24 papers reported a positive effect. The estimates vary between studies. A first group of studies with small effect sizes report that social information increases donations by about 10% (Bekkers, 2012; Croson & Shang, 2008; Shang et al., 2012; Shang & Croson, 2009), a second group hovers around 15% (Cialdini & Schroeder, 1976; Croson & Shang, 2013; Smith et al., 2015), and several studies report values in the 20% range (Agerström, Carlsson, Nicklasson, & Guntell, 2016; Alpizar et al., 2008a; Martin & Randal, 2008). The average increase due to social information is 14%.

The prevailing explanation why social information works is that information about the decision of others creates a social norm (Bøg, Harmgart, Huck, & Jeffers, 2012; Croson et al., 2009; Croson & Shang, 2008, 2013; Edwards & List, 2013; Meyer & Yang, 2015; Murphy et al, 2015; van Teunenbroek et al., 2020; Sasaki, 2018; Smith et al., 2015). The average donation amount provides a cue about what is typically done by others. A classic premise in social psychology is that humans have a strong desire to follow social norms and mirror the behavior of others (Bernheim, 1994; Festinger, 1954). According to social comparison theory, humans evaluate themselves in comparison with others, for instance to reduce uncertainty (Festinger, 1954). Thus, human decision-making is influenced by social norms and people

**Figure 1**  
**Expected Distribution of the Social Information Effect and Amount Donated**



mimic the behavior of others. When the default is not to give or to give less than the norm, social information increases donations. Accordingly, we propose that:

*Hypothesis 1: Social information increases the amount donated.*

### How the Effect of Social Information Varies with the Project Funding Stage

A crowdfunding campaign runs for a predefined number of days, during which the target amount must be assembled to be considered successful. Taking the project funding stage into account is important, since the effects of social information could vary with the fundraising stage. An earlier study found that social information in the form of fake (i.e. created to mislead consumers) Facebook Likes differently affected the number of donors to crowdfunding campaigns depending on the fundraising stage: initially there was a positive effect, followed by a negative effect over time (Wessel, Thies & Benlian, 2016). While the social information observed by Wessel et al. (2016) differs from mentioning the donation amount of others, it does show the importance of the funding stage. We assume that the donors in the middle of the campaign are especially

sensitive to our form of social information. The assumption is based on the idea that social information provides a quality signal to donors (van Teunenbroek et al., 2020; Vesterlund, 2003), as argued in theories on philanthropy from communication science, behavioral economics, and social psychology.

**Initial stage.** At the initial stage, a project is seen as new and innovative which attracts individuals motivated by contributing to new ideas (Rogers, 1995). These donors are not motivated by the example of others. Instead, they want to lead and they want to be first: they are the ‘early adopters’. Rogers argues that innovations spread through communication among peers. In our case, the number of donors and the amount assembled per day is expected to be relatively high in the beginning of a campaign, see Figure 1.

A similar donor type is described in the philanthropic literature: the impact donor cares about the impact of her donation on the provision of a public good. Impact donors want to be pivotal, and care about the difference that their donation makes (Duncan, 2004). The impact motive explains why some donors prefer to fund a specific part of a project rather than the entire project. The impact donor finds a project less attractive if more donors have contributed, since the contributions of other donors reduce the impact of her additional donation. This implies

that for impact donors, social information in the initial stage will have no or even a negative effect. In addition, in the beginning of the campaign the crowdfunding project is mostly supported by family and friends who have strong ties to the creator. They donate because they have a close connection with the creator (Borst, Moser, & Ferguson, 2018) and not so much because they want to make a difference or support a high-quality project.

**Middle stage.** After the group of innovative enthusiasts and strong ties from the creators' network is exhausted, a different type of donor must step in. The crowdfunding literature describes that at this point, in the middle of the campaign, the number of donations per day decreases (Kuppuswamy & Bayus, 2015). This is the stage where social information could have the greatest impact, because identification with the creator is relatively weak. In the middle stage of crowdfunding projects donors are much less likely to have a social connection with the creator (Borst et al., 2018; de Witt, 2012). When identification is weak, individuals mainly base their donation decision on the perceived quality of the project and they wonder whether the project is worthwhile (Fishbach, Henderson, Koo, 2011). We expect that social information could be particularly effective at this stage, since social information signals that others value the project enough to support it (Vesterlund, 2003). Knowing that others have already donated, new donors can assume that other donors have checked it out and rest assured that the project is worth supporting.

**End stage.** Throughout the fundraising period, the distance to the target amount decreases with each donation. As the total number of donors reaches a certain threshold it becomes increasingly attractive for individuals who want to interact in a successful social setting (Oliver, Marwell, & Teixeira, 1985). In other words, by donating at this stage, donors become part of the critical mass that reaches the target amount (Markus, 1987). As the number of previous donors to a project increases, so do the odds of a new donor making a donation (Oliver, & Marwell, 1988): the closer a crowdfunding campaign comes to the target amount the higher the participation rate (Kuppuswamy & Bayus, 2017; Zvilichovsky et al., 2018).

Our project funding stage hypothesis proposes that:

*Hypothesis 2: Social information is less effective in the beginning as well as towards the end of the campaign, and most effective in the middle of the campaign.*

## Methods

### *Study Context*

The data we analyzed was collected at Voordekunst, the largest crowdfunding platform in the Netherlands for cultural and arts projects, including for example dance, photography, music, theatre, movies and visual arts productions. More information about the platform can be found in Appendix B. Below we report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study.

### *Study Design*

After a pre-test in a classroom setting (Van Teunenbroek, 2016) we preregistered the experiment at [Aspredicted.org](https://aspredicted.org) (<https://aspredicted.org/u5w9u.pdf>, Appendix C).

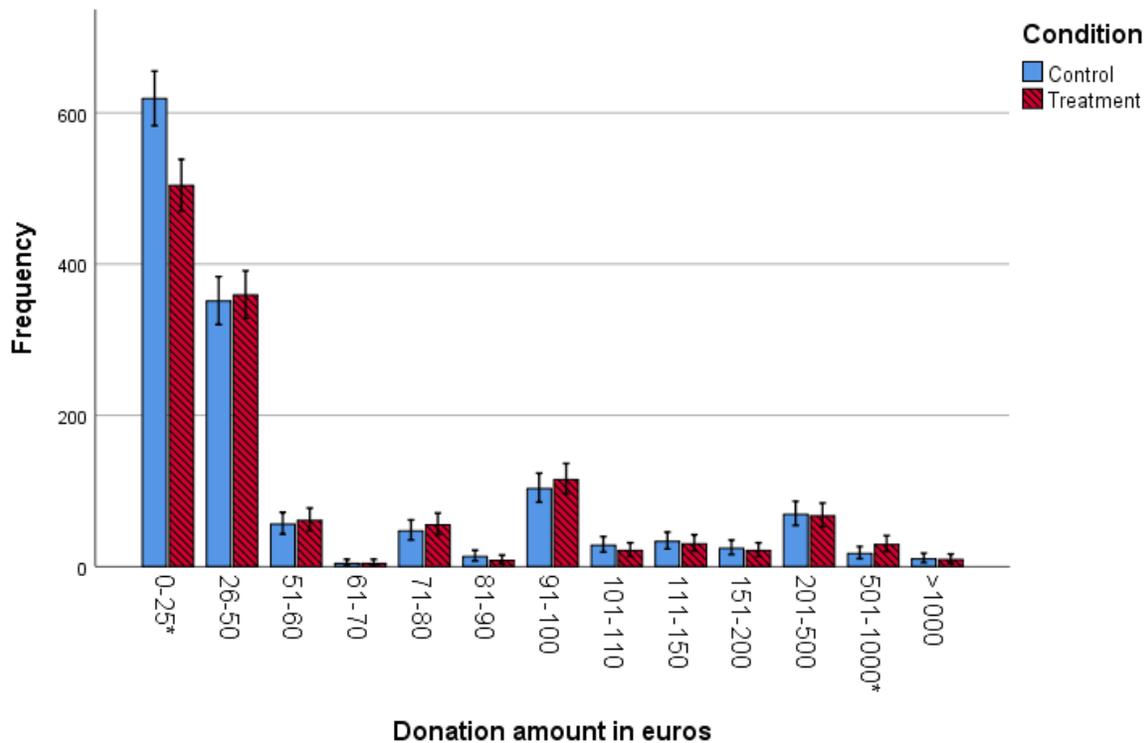
We measure two dependent variables: 1) individual donation amount; and the 2) number of donors. Visitors to the website were randomly distributed (50:50) over two conditions using browser cookies. Cookies ensure that participants using a specific desktop end up in the same condition each time they visit the website, regardless of the project(s) they view or what entry to the website (e.g., through social media, email or a direct URL visit) they used. Our treatment (Appendix A) is the addition of social information to all projects advertised on the platform with the following sentence: "Did you know that the average donation amount at Voordekunst is €82?". Convinced by Hertwig & Ortmann (2001), we used the principle of no deception, and showed website visitors in the treatment group the actual average amount donated by donors on the platform in the preceding six months.

Because it was not possible to include a manipulation check after donors finalized the payment procedure on the platform, we do not know if the participants paid attention to the social information given in the treatment condition. However, the only difference between the control and the treatment group is the provision of social information. Therefore, it is reasonable to assume that a difference in behavior between the two conditions is a result of the manipulation in the treatment condition.

**Table 1**  
**Data Description by Condition**

	Treatment	Control	All
Number of visitors	11,973	12,097	24,070
Number of donors	1,283	1,374	2,657
Mean amount donated	97.53 ( <i>SD</i> = 310.24)	94.33 ( <i>SD</i> = 347.20)	95.87 ( <i>SD</i> = 310.24)
Median amount donated	35.00	30.00	35.00
Number of outliers	9	10	19
Mean amount donated excluding outliers	80.73 ( <i>SD</i> = 146.96)	69.54 ( <i>SD</i> = 116.74)	74.95 ( <i>SD</i> = 132.29)

**Figure 2**  
**Histogram of the amounts donated per condition.**



Error bars: 95% CI

Note: A Chi square test indicates that social information did not affect the distribution of amounts over all categories (significance indicated by a \* at  $p < .05$ ).

**Table 2**  
**Median Amount Donated Per Funding Stage**

Project stage	Control	Treatment	Test statistics	Significance
Beginning	€25.00	€30.00	$U = 278984.50$	.039
Middle	€40.00	€50.00	$U = 29327.00$	.421
End	€40.00	€36.75	$U = 46898.50$	.714

The experiment was only conducted among desktop users, ignoring other devices such as mobile phones and tablets. While we wanted to include all types of devices, due to technical limitations this was not possible. Data provided by the platform revealed that about two thirds of donors use a desktop (64%).

Crowdfunding platforms host many projects and each project receives donations from many donors. The data assembled give us a unique opportunity to test for these project effects. We exploit the natural variation in crowdfunding at two levels: project funding time (i.e., the number of days since the project launched, at the time of the individual donation), and projects. Because the data were completely anonymized, we do not have information identifying website visitors or donors.

#### *Study Procedure*

On the crowdfunding platform, each project has a separate webpage. If a participant decides to donate on a project page, the donor is sent from the 'project page' to the 'donation page'. In the treatment condition, the average donation amount is mentioned on both pages at the same place and with similar framing (see appendix A).

On the donation page, the donor specifies the amount she wants to donate, and whether she wants to receive a reward if the donation is high enough to receive a reward. The participant is then guided towards the 'payment page'. On this page, no social information was mentioned.

#### *Participants*

The experiment was conducted among 24,070 unique website visitors of the Voordekunst platform in September 2016. 11,973 website visitors were assigned to the treatment condition and 12,097 in the control condition. 2,657 website visitors (11.0%) donated, 1,374 in the control group (51.7%) and 1,283 in the treatment condition (48.3%).

#### *Data Description*

The data consists of visitors and donors (see Table 1). Website visitors are all individuals who visited the platform using a desktop within our period. Donors are all individuals who donated using a desktop in the time of our period. Each donation is made by a donor to a specific project. During the period of our experiment, donations were made to  $n = 119$  different projects.

As the histogram in Figure 2 shows, the amounts donated are not normally distributed, giving rise to the possibility that a few very large donations greatly affect the total amount donated. We used a single-construct technique of standard deviation analysis (Aguinis, Gottfredson, & Joo, 2013), and considered a data point as an outlier if it was more than three standard deviations from the mean. While most donations hover around 25 euros for both the control and treatment condition, there were a few exceptionally large donations (1.39%,  $n = 19$ ), more than three standard deviations above the average. Therefore, we focus on median amounts, and use a Mann-Whitney  $U$  Test unless otherwise noted. See Appendix E for a robustness analysis where we explore the data with a model including the natural logs of the amounts donated.

## **Results**

#### *Social Information Increases Amounts Donated*

We hypothesized that social information increased individual donation amounts. This hypothesis was supported by the data ( $U = 836375.50$ ,  $n = 2,657$ ,  $Z = -2.289$ ,  $p = .022$ ,  $r = .04$ ). The median donation in the treatment group (€35) was 17% higher than in the control group (€30).

A regression analysis of the natural log of the amounts donated with project fixed effects confirmed that social information increased amounts donated ( $b = 3.68$ ,  $n = 2,657$ ,  $p = .018$ ). Social information did not stimulate more people to give. There was no difference in the number of website visitors

who donated between the treatment and control condition ( $X^2 = 1.50$ ,  $n = 24,070$ ,  $p = .221$ ). The conversion rate for the control condition was 11.4% and 10.7% for the treatment condition.

#### *Social Information Effects Throughout the Campaign*

To test the project stage hypothesis, we compared the amounts donated in the treatment and control group in the beginning, middle, and end stages of crowdfunding projects (Table 2; Appendix D provides a more elaborate description).

The median amount donated was highest in the middle stage (see Table 2). While median amounts in the middle stage were 25% higher in the treatment than the control condition, the effect was not significant in this stage,  $U = 29327.00$ ,  $n = 495$ ,  $p = .421$ . The effect was only significant in the beginning stage ( $U = 278984.50$ ,  $n = 1,544$ ,  $p = .039$ ), when median donation amounts were 20% higher in the treatment condition than in the control condition. Social information did not increase donations in the end stage, with median donations being slightly lower (8%) in the treatment condition than in the control. The effect of social information was not significant at this stage,  $U = 46898.50$ ,  $n = 618$ ,  $p = .714$ . Next, we tested whether the effect of social information on donation amounts was moderated by the project funding scale. Given the skewness of the data, we used the natural log of the donation amounts. A regression showed a negative but insignificant effect of the moderation effect ( $b = -.01$ ,  $n = 2,657$ ,  $p = .769$ ).

#### *Social Information Did Not Constitute a Social Norm*

Figure 2 shows the distribution of the amounts donated per condition. The difference between the control and the treatment group was not as predicted. In the treatment condition, only one donation of exactly €82 was made, and fewer donations in the category of €81-90 were made in the treatment group (0.6%) than in the control group (0.9%). This result indicates that the amount we mentioned did not constitute a social norm that the participants followed. Instead, the treatment seems to have increased the number of donations that are clearly higher than the average donation of €82 we mentioned. In the treatment condition, 9.0% donated between €91 and €100 vs 7.6% in the control group, but not significantly so (see Figure 2). The treatment significantly lowered the proportion of donations up to €25 (45.1% in control vs 39.3% in treatment). Importantly, the treatment significantly increased amounts between €501 and €1000 (1.7% vs 2.7%).

## Discussion and Conclusion

Our analysis revealed support for the main hypothesis, that social information increases amounts donated. We found a modestly positive effect of about 17%, which is close to the 14% found in previous studies. However, social information did not attract more donors: the participation rate was unaffected. This is an important result because nudges can also backfire in the form of a lower likelihood of donations when donors consider them as coercive (Goswami & Urminsky, 2016). The social information we provided did not scare away donors who planned to give lower amounts.

In our *project stage hypothesis*, we predicted that the effect of social information would be strongest in the middle of the campaign, in which most donors consist of individuals searching for cues. While we found individuals in the middle of the campaign to give 25% higher amounts when presented with social information, this difference was not significant. We only found a significant effect (20% increase) of social information at the beginning of crowdfunding campaigns. Our assumption that individuals in the middle of the campaign are more uncertain about the quality of the project and therefore rely more heavily on social information than donors in the beginning stage may be incorrect. In addition, our assumption that friends and family are less strongly affected by social information may also be incorrect. We know from an earlier study of donations on the same platform with similar projects that donors in the beginning and end stage of a crowdfunding project mainly consist of family and friends, while donors in the middle of the project are mostly unknown to the creator (Borst et al., 2018). Our current results indicate that social information is most effective in the beginning of crowdfunding campaigns but continues to be effective in the middle and end stage. This pattern is unlikely to be a result of differences in the social ties with creators alone.

We explored whether the specific amount we mentioned (€82) would set a norm that others follow by donating the exact same amount as found by Sasaki (2019), van Teunenbroek (2016) and Bekkers (2012). We clearly did not find such a pattern. Perhaps the discrepancy is a result of the amount we suggested being a peculiar number (€82) rather than a round number such as €35 or ¥10,000. In any case, our results suggest that social information can affect giving even when it does not create conformity. Alternatively, it is possible that social information incr-

eases the awareness of the need for donations and provides a signal of quality (van Teunenbroek et al., 2019). Because we could not include a manipulation check in the field experiment, future research is required to test these explanations.

### Limitations

One limitation of the study is that we were unable to rule out contamination due to the field setting. First, participants in the treatment group may have shared the social information with participants in the control group. While we cannot rule out that contamination occurred, we do not have indications that participants

were troubled by the manipulation and discussed it with others. Second, website visitors that disable or remove cookies after a browsing session, browse in incognito mode, or use different browsers may be exposed to different conditions. Data collected by the platform indicates that the proportion of recurring

donors on the platform was low (13%) (Voordekunst, 2016a). While we have received no questions or remarks from website visitors about peculiarities in the design of the platform, it is possible that some users were exposed to different conditions. This may have weakened the effect of our manipulation, and the effect size we obtained may be an underestimation.

A second limitation of our experiment is that we have no information about the characteristics of individual donors. We considered adding a short survey to collect individual donor data. However, we opted not to do so because in all likelihood the response rate would be very low and selective. More research is needed to specify segments of donors for whom social information is particularly effective.

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## Appendix

### Appendix A

#### Example of a Treatment Condition

An The text in the yellow rectangle, “Wist je dat de gemiddelde donatie op Voordekunst €82 is?” – “Did you know that the average gift on Voordekunst is €82?”, was only shown in the treatment condition. Project pages such as the example below were exactly the same, but omitted the yellow rectangle.

**€ 5.778**  
van € 0.000

**19 dagen**  
te gaan

**85 donateurs**

96%

**Doneer nu**

Het verhaal Updates 1 Donaties 85

**Mathilde**

Mathilde: Nederlands bekendste muze. Zeeuws meisje. Het Fenomeen, levend kunstwerk, mode-koningin van de jaren zeventig, muze en (ex)vrouw van Carel Willink, ambassadrice van Fong-Leng, mythe en mysterie.

Mathilde is op 7/7/1938 in Terneuzen geboren als Mathilde Maria Theodora de Doelder. Na het gymnasium vertrekt zij naar Amsterdam om kunstgeschiedenis en klassieke talen te studeren. Aldaar ontmoet zij de veertig jaar oudere schilder Carel Willink. Zij wordt zijn muze en vrouw. Dankzij de extravagante Mathilde komt Willinks werk weer meer in de belangstelling. Wanneer zij begin jaren zeventig de creaties van kunstenaars Fong-Leng ontdekt, wordt zij steeds bekender. Mathildes hart breekt als Willink haar na veertien jaar samen, verlaat voor een jongere vrouw. Zij gaat op zoek naar kunstenaars van wie zij opnieuw de muze kan zijn, waaronder Salvador Dalí en Anton Heyboer. Niet alleen door haar uiterlijk maar ook door haar uitspraken neemt Mathildes bekendheid steeds grotere vormen aan. Op 25/10/1977 wordt Mathilde dood gevonden in haar hemelbed, met een schotwond in haar linkerslaap. Haar dood is een mysterie, de zaak is nooit opgelost en inmiddels verjaard. Zowel haar excentrieke leven als haar mysterieuze dood hebben eraan bijgedragen dat Mathilde-Willink nog altijd een begrip is.

Wist je dat de gemiddelde donatie op voordekunst €82 is?

Tip

**€ 50 of meer**

57 donaties

Je ontvangt na publicatie het boek (gesigneerd door de schrijfster)

Verwachte levertijd – november 2016

**€ 10 of meer**

5 donaties

Ontzettend bedankt voor je steun!

## *Appendix B*

### *The Voordekunst Crowdfunding Platform*

Voordekunst is a philanthropic crowdfunding platform that uses a reward and donation-based model (van Teunenbroek et al., 2018), with an all-or-nothing model at an eighty per cent rule. This means that projects advertised on the platform must assemble at least eighty per cent of the target amount within the time frame, otherwise all donations are returned to the donors. The rewards range from a mere thank you message to a private tour through a museum at night. The minimum donation amount on the platform is €10. The rewards are presented in a reward scheme on the projects page. The rewards do not always occur at the same donation amounts; fundraisers can design their own reward schemes. The project page shows information about the target amount, the number of days remaining until the campaign is closed, the number of donors, and the percentage of the target amount donated thus far. While both companies and individuals can make donations, we excluded donations from companies during our analysis. In 2015 the platform hosted 712 projects with a success rate of 81% and a total donation amount of €3,558,549 (Voordekunst, 2016a), donated by 40,107 donors (Voordekunst, 2016b). A small minority of donors (13%) supported multiple projects on the platform in the same year (Voordekunst, 2016a).

Before the data collection started, we conducted a power analysis to determine the number of participants required to detect a 14% effect size at 80% power and a desired significance level of  $p = .05$ , resulting in a required sample of  $\sim 900$ . At a conversion rate of 5.27%, we computed that around 45,000 visitors to the website were required to achieve the desired sample size. Based on the number of visitors per week, we estimated that the experiment would need to run about 4 weeks. Coincidentally, we were told that on average a project creator needs about 1 month to assemble the money. Thus, we reasoned that one month should be enough to reach the desired sample and assemble information of the whole lifespan of a project. Consequently, we planned the data collection for our study to span a period of 30 days, from September 15 until October 16, 2016. All projects in this time are included.

An anonymous reviewer noted that the effect size we projected in the preregistration was biased because it was based solely on studies reporting positive effects. We recalculated the effect size, this time including all studies that manipulated the donation amount of donors by showing (or telling) the average donation amount of previous donors. We only included papers that reported the average donation amount and as an independent variable focused on average donations. We excluded papers that mentioned the donation amount of one previous donor, such as Klinowski (2015), Murphy et al. (2015) and Croson et al. (2013) because Sell and Wilson (1991) found that aggregated social information results in lower contributions than specific social information about one individual. Of the 35 studies reviewed by van Teunenbroek et al. (2019), six studies (Adena et al., 2014; Hysenbelli et al., 2013; Jones et al., 2004; Sell et al., 1991; Catt et al., 1977; Cialdini et al., 1976) fit our criteria. The amounts donated in the treatment conditions of these papers were on average 22% higher than in the control groups. In retrospect, we should have used the 22% effect size to conduct the power analysis to calculate the minimum sample size. With this effect size, the minimum sample size would have been  $n = 652$ . As the conversion from visitors to donors in the period we conducted our experiment (11.0%) was about twice the number we projected (5.3%), our sample of 2,657 is well-powered.

## Appendix C

### Pre-registration

This study was preregistered at Aspredicted.org on September 14, 2016, <https://aspredicted.org/u5w9u.pdf>.



### JOINING THE CROWD (#1186)

#### Author(s)

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Created: 09/14/2016 12:00 PM (PT)

Public: 09/15/2016 03:03 PM (PT)

#### 1) What's the main question being asked or hypothesis being tested in this study?

Research question: What is the influence of social information on donation behavior on an online crowdfunding platform? Our key hypothesis is that social information increases the amount donated.

#### 2) Describe the key dependent variable(s) specifying how they will be measured.

We measure two dependent variables:

- 1) whether or not a visitor of the platform makes a donation;
- 2) individual donation amount: the total amount donated to a project per donor;
- 3) the natural logarithm of the individual donation amount.

#### 3) How many and which conditions will participants be assigned to?

This is a straightforward A/B test with two conditions in a natural field experiment:

- (1) control condition: without adding social information
- (2) treatment condition: adding social information using the following sentence: "Wist je dat de gemiddelde gift op Voordekunst €82 is?" ["Did you know that the average donation amount at voordekunst is €82?"]. We will present this information on the project information page as well as on the donation page.

#### 4) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

Straightforward comparisons of means without covariants will be conducted in the analysis of amounts donated as well as non-parametric tests when donation amounts are not distributed normally. Amounts donated will also be analyzed in OLS, tobit and quantile regression models, including fixed effects at the project, time and individual level. Empty models will be run to estimate variance components at these levels. Conversion will be modeled in logistic regression models. Zero-inflated (negative binomial) models will be estimated in robustness checks.

#### 5) Any secondary analyses?

In addition, we test how the social information effect varies during the period a project is advertised. We expect that social information is less effective in the beginning as well as towards the end of the campaign, and most effective in the middle period.

Finally, we examine how the social information effect varies with the concurrent average donation amount, testing two hypotheses. The social norm hypothesis predicts that when the amount displayed in the social information condition is larger than the intended donation amount, the amount donated increases, and when the amount displayed is lower the amount donated decreases. The reactance hypothesis predicts that the larger the difference between the amount displayed in the social information condition and the amount donors intended to give, the smaller the effect of the amount displayed.

When individual donor data become available previous donation behavior and amounts will be examined in exploratory analyses as potential moderators of the social information effect.

#### 6) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

Based on an effect size of .15 (based on previous research), we aim to achieve a sample of 900 donors. With a conversion rate of 5.27% we will need around 45,000 donors to achieve this sample size, which we estimate will take about 4 weeks.

#### 7) Anything else you would like to pre-register? (e.g., data exclusions, variables collected for exploratory purposes, unusual analyses planned?)

The design is developed into a concept and uploaded by an external company: Digital Natives

#### 8) Have any data been collected for this study already?

No, no data have been collected for this study yet

## Appendix D

### *Description of the Project Period Stages*

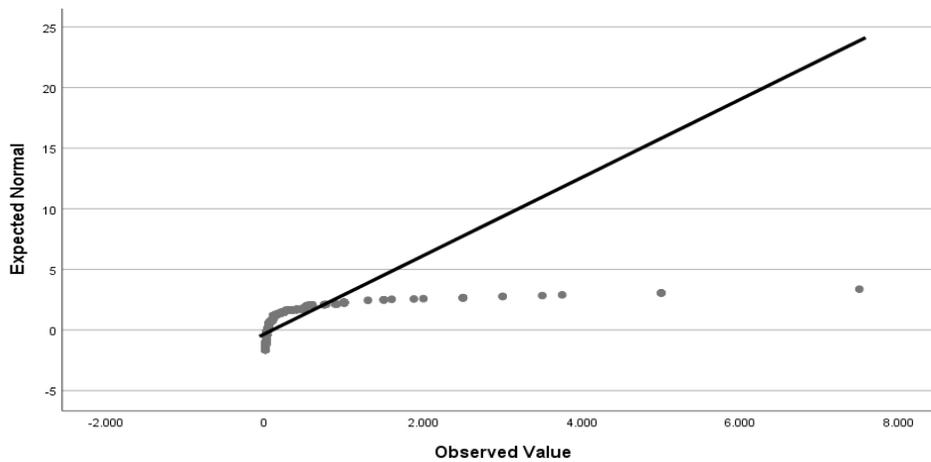
On average, the number of days since the project started at the time of donation was 32.69 days (SD = 19.67,  $n = 2,657$ ), with a maximum of 96 days. Since this is longer than the time window we planned for the experiment, we focused solely on the projects that started before the launch of our study to divide the funding campaigns into stages. We computed a project funding stage based on the quantiles of the numbers of days since the project was launched since a donation. We categorized donations made in the first 25 days as belonging to the beginning of the campaigns. As it happens, donations made in the first 25 days also constitute the first quartile of donations made. These donations were assigned the value of 0. Donations made in the second and third quartile (the 25th to 75th percentile) were categorized as the middle of the campaigns. These donations were assigned the value of 1. Finally, donations made in the fourth quartile were made after 40 days since the beginning of the campaigns and were categorized as the end of the campaign (value 2).

## Appendix E

### *Robustness Analysis*

An OLS regression analysis of all raw data shows a positive, but insignificant parameter. However, the data is heavily right skewed (see Figure 2). The Q-Q Plot of amounts donated (Figure 3) indicates that our data are very unlikely to have been generated by a normal distribution, and contain outliers.

**Figure 3**  
**Q-Q Plot of the Amounts Donated**

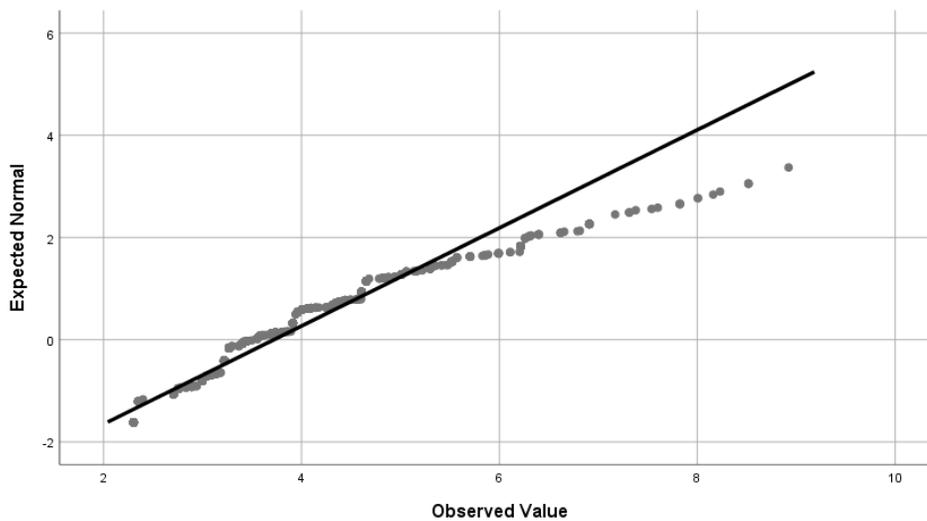


Deaton & Cartwright (2018) describe three ways to deal with outliers: 1. eliminating, 2. trimming or 3. transforming observations. We tested the effect of social information in eight additional analyses reported in Table 3. First, we eliminated donations above three standard deviations (see Aguinis et al., 2013), resulting in a positive significant effect. Second, we winsorized the data. In analyses capping donations three standard deviations above the mean at €1026 the effect of social information was not significant. Similar results emerged when we winsorized observations at two standard deviations (€716), or one standard deviation (€407) above the average. Third, we transformed the data using the natural log of the donation amounts. This resulted in a positive and significant effect of social information. Transforming the data helped to produce symmetry (Figure 4), even more so when we excluded the outliers (Figure 5).

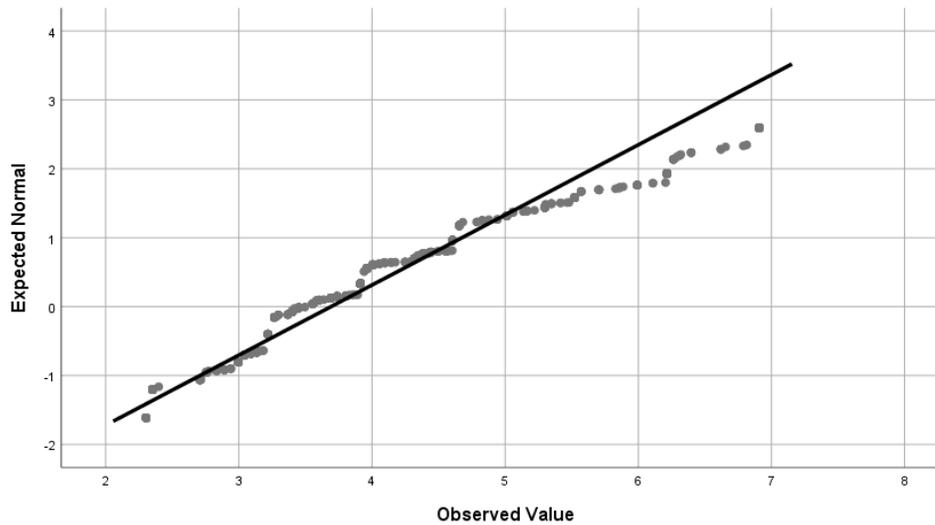
**Table 3**  
**Summary Table of the Effect of Social Information on Donation Behavior**

Test	Parameter	<i>P</i> value
0. Regression including outliers	$b = 3.21$	.790
1. Regression excluding outliers	$b = 11.19$	.030
2a. Regression Winsorizing at one standard deviation	$b = 5.50$	.119
2b. Regression Winsorizing at two standard deviations	$b = 8.33$	.090
2c. Regression Winsorizing at three standard deviations	$b = 10.86$	.070
3a. Regression natural log	$b = .08$	.041
3b. Regression natural log excluding outliers	$b = .09$	.024

**Figure 4**  
**Q-Q Plot of the Natural Log of the Amounts Donated**



**Figure 5**  
**Q-Q Plot of the Natural Log of the Amounts Donated, Excluding Outliers**



*Project characteristics*

At each project page, a visitor can see additional information about the project: (1) the amount donated thus far, (2) the number of donors thus far, and (3) the percentage of the target amount assembled thus far. We explored the robustness of the effect of social information with respect to these project characteristics in a regression analysis analyzing the natural log of donation amounts reported in Table 4. We provide estimates for two models: a. including all observations; b. excluding outliers. As in the main analyses, the results show positive coefficients for social information in both models. The significance level is sensitive to inclusion of outliers ( $p = .051$  including all donations,  $p = .029$  excluding outliers). The results also show that the total amount of previous donations is related to the amount donated by new donors, but the effect is miniscule. Model 3 shows a negative relationship between the amount donated and the total number of donations made to a project. However, the effect is small. The percentage of the target amount assembled is not related to the amount donated. In sum: both the previously donated amount and the number of donations are related to the amounts donated. However, the relationship with the amount donated is miniscule and the effect of social information holds while including these additional information aspects.

**Table 4**  
**Regression Analysis of the Natural Log of the Amounts Donated Including Project Characteristics**

	Model 1		Model 2		Model 3		Model 4	
	a	b	a	b	a	b	a	B
Social information	.08*	.09*	.08*	.09*	.08	.08*	.08	.08*
Amount donated <sup>1</sup>			1.97***	1.79***	3.78***	3.28***	3.77***	3.26***

Number of donations					-.01***	-.01***	-.01***	<.01**
Percentage assembled							<.01	<.01
Donors	2,657	2,638	2,657	2,638	2,657	2,638	2,657	2,638
Projects	119	119	119	119	119	119	119	119
Constant	3.68	3.65	3.62	3.60	3.69	3.66	3.58	3.53
R Square	<.01	<.01	.02	.02	.03	.03	.03	.03
Project fixed effects	YES	YES	NO	NO	NO	NO	NO	NO

Notes: a: including all observations; b: excluding outliers

<sup>1</sup> multiplied by 1,000

\*\*\*p<.001; \*\*p<.01; \*p<.05