Conformity or Counter-Conformity Behavior? The Effect of Prior Charitable giving in Donation-based Crowdfunding

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ABSTRACT

Charitable crowdfunding is a new and rapidly developing way of fundraising, attracting interest from academics and practitioners. Existing research on reward-based crowdfunding and charitable giving cannot fully explain donation behaviors in donation-based crowd funding. Developing methods for promoting donations is of interest to practitioners, and it remains unclear whether prior donation information promotes or inhibits subsequent contributions. To explore this question, we used data from the Tencent Philanthropy platform to analyze the impact of previous donation information. The results revealed a negative relationship between the cumulative donation amount and subsequent contributions. The cumulative donation amount had no significant impact on the number of donors, but reduced the amounts of individual contributions. Although a larger cumulative number of previous donors resulted in larger individual donation amounts, this number was associated with a smaller number of subsequent donors, resulting in a zero net effect of donor number on subsequent donations. Our results indicate that conformity and anti-conformity donation behaviors exist simultaneously in donation-based crowdfunding, elucidating the mechanisms underlying the effects of prior donation information on reducing subsequent contributions. Our findings deepen the theoretical understanding of individual donation behavior, providing helpful insight for practitioners designing presentation strategies for charitable crowdfunding projects.

1.   Introduction

Charitable crowdfunding is a distinct and growing channel of charitable giving. This relatively new and increasingly popular phenomenon has attracted substantial attention from researchers and practitioners (Argo, Klinowski, Krishnamurti, & Smith, 2020; Yuangao Chen, Dai, Yao, & Li, 2019).

Donation behavior in charitable crowdfunding has attracted substantial interest among academics because existing theory cannot fully explain donation behavior in charitable crowdfunding platforms. First, donor behavior in charitable crowdfunding has been found to differ from that in reward-

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based crowdfunding(Zhang & Chen, 2019). Donors' funding motivations vary between charity-based and reward-based crowdfunding, and strategies identified as effective in the commercial sector may not be suitable for the nonprofits (Zhou & Ye, 2018). Second, charitable crowdfunding differs from traditional charitable giving in several important ways. When individuals make a donation via a charitable crowdfunding website, they are typically anonymous, meaning that social image is unlikely to be an important motivator (Gleasure & Feller, 2016). In most situations, donors have few or no social or geographical connections to those seeking funding, so the role of reciprocity is also questionable. In cyberspace, donors do not typically encounter the social pressure involved in face-to-face donations (DellaVigna, List, & Malmendier, 2012). These significant distinctions challenge existing explanations of donation behavior in conventional acts of charity.

Understanding the influence of donor giving is important for practitioners. Although the popularity of charitable crowdfunding is growing, many charitable projects have difficulty soliciting funds, and fail to achieve their financing goals within a stipulated period. Thus, the issue of how to collect donations more effectively and achieve fundraising targets at a faster pace has become increasingly important (Y. Chen et al., 2019; Li, Wu, Hsieh, & Liou, 2020; Sasaki, 2019).

Previous studies investigating effective methods for increasing the success of projects have focused on factors that influence donors' donation behavior in online charitable crowdfunding, such as tangible rewards (Zhao & Sun, 2020), government involvement (Hong & Ryu, 2019), rational and credible appeals (Majumdar & Bose, 2018), description of the project (Xu, 2018), price and competition (Meer, 2014), the legitimacy of the project (Zhou & Ye, 2018), and previous success rates of project founders (Bukhari, Usman, Usman, & Hussain, 2020). These previous studies have focused on the innate characteristics of projects. In contrast, the current study investigated the dynamics of the project fundraising process. We hypothesized that previous donation information would affect subsequent fundraising of a project.

In crowdfunding and traditional charitable donation studies, many studies have identified positive relationships with previous donation information and subsequent donor decisions (Bekkers & Wiepking, 2010; Burtch, Hong, & Liu, 2018; Croson & Shang, 2008; Kim & Viswanathan, 2019; Vismara, 2018). In charitable crowdfunding, the behavior of following others may or may not occur. On one hand, individuals' attention to pre-capital accumulation in charitable donations may weaken donation behavior; because donation-based projects are often unreturned, people are more inclined to donate to a project that inspires their compassion, in which case personal values are more dominant in judgment, more private information enters decisions, and the probability of following others becomes lower. On the other hand, charitable giving may strengthen the similarity between donor decision-making and the decision-making of the donor's peers, because charitable giving carries no monetary benefit in return. Thus, the sense of achievement brought about by the success of the project constitutes the return. The more funds raised, the easier it is to reach the target. In addition, making a contribution to fulfill collective efforts and being a member of a team have been reported as motivations for individuals to donate (Bagheri, Chitsazan, & Ebrahimi, 2019). Thus, contributing to projects with more donors may be more likely to satisfy this motivation, and people will be more inclined to follow the decisions of the group and exhibit clear behaviors of following others. In the current study, we sought to investigate whether previous donation information is related to subsequent donation behavior in charitable crowdfunding, and, if so, to clarify the influence path of this effect.

In practice, fundraisers often aim to increase charitable giving by using information about other people's behavior (van Teunenbroek, Bekkers, & Beersma, 2020). For example, many charitable and crowdfunding organizations post information about the donations of previous donors on their websites in an attempt to elicit more giving. However, the impact of donation information on contributions is not well understood (Irlenbusch, Rilke, & Walkowitz, 2019). In particular, the optimal method of selecting and displaying the different types of donation information remains unclear (Q. Chen, Chen, & Wang, 2019).

Relatively few studies have examined whether and how previous donation information affects subsequent donation behavior in charitable crowdfunding. Among the small number of relevant studies, some have reported that previous donation information has a positive effect on the donation amount. In contrast, other studies have reported negative effects, suggesting that donation information decreased charitable giving. On one hand, Sasaki (2019) investigated a dataset of actual donations on a

donation-based crowdfunding platform, JapanGiving, revealing that, when the number of most recent continuous modal donations increased, the likelihood that a subsequent donor matched the modal amount increased. Smith, Windmeijer, and Wright (2015) also reported substantial positive peer effects: a £10 increase in the mean past donation increased giving by an average of £2.50. On the other hand, Gleasure and Feller (2016) conducted an in-depth exploration of a charitable crowdfunding website, Razoo.com, and reported that the number of donations per day was a negative predictor of donation likelihood, thereby indicating that donors were less likely to donate to fundraisers where other donors were contributing at a rapid rate. In addition, a study by Tan, Lu, and Tan (2016) demonstrated that, despite the platform designers' intention of improving fundraising performance, higher visibility of donors' contributions can have a negative impact on fundraising. Burtch, Ghose, and Wattal (2013) empirically examined social influence in a crowd-funded marketplace for online journalism projects, suggesting that contributors may experience a decrease in their marginal utility from making a contribution, meaning that, as individuals observe others contributing more frequently, the amount they are inclined to contribute falls.

Based on existing studies regarding previous donation information effects, clear conclusions cannot be drawn regarding the extent to which the donation information of previous donors affects subsequent donation behavior in charitable crowdfunding. Inconsistencies in the literature suggest the need for a systematic study to explore the effects of donation information, Therefore, in the current study, we investigated whether and under what conditions previous donation information exerts an influence on subsequent donation behavior in a charitable crowdfunding context, to address the gap between practice and theoretical knowledge.

In this study, we crawled charity project donation dynamic data from the Tencent Philanthropy platform. Tencent Philanthropy is one of the largest Internet fundraising platforms in the world. Individuals, non-public offering agencies and public offering agencies can register and initiate fundraising projects on the platform. The projects cover various fields of philanthropy and charity, including disease, poverty and disaster relief, education, and environmental protection. First, we analyzed the effects of the cumulative number of donors, the cumulative amount of previous contributions, and the achievement rate of each charitable project goal on the subsequent donation amount to explore whether individuals follow the patterns of previous donation behavior information. Second, we analyzed the influence of previous donation information on individual donation amounts, and the number of donors. The amount of new contributions is the product of the number of donors and individual donation amounts, reflecting how many people choose the project, and how much money people choose to donate when they have decided to donate. Thus, we were able to explore the influence of previous information on the fundraising performance of a project in depth.

The results revealed a negative relationship between later contributions and previous cumulative contribution amount, and no relationship between later contributions and the cumulative number of donors. This result suggests that, in charitable crowdfunding, donors not only do not imitate the choices of predecessors, but deviate from their choices to some extent. To investigate this issue in more depth, we analyzed the reasons underlying the relationship described above. First, we examined the causes of the negative relationship between subsequent contributions and the previous cumulative donation amount, revealing that individual contributions became smaller while the number of donors did not change significantly. Second, the lack of a significant relationship between later contributions and the previous cumulative number of donors did not indicate that the cumulative number of donors does not affect the donation decision; as the cumulative number of donors increased, individual donations increased and the number of new donors became smaller. Importantly, positive and negative effects offsetting one another concealed the relationship between subsequent contributions and the cumulative number of contributions. Overall, we found that the number of prior contributions affected individuals' decision-making in two ways.

The main contributions of the current study were as follows. First, the results revealed that greater prior accumulative funding was associated with lower subsequent donations, adding to previous literature regarding the impact of prior cumulative donation information. Second, the current findings revealed the mixed motivations of people when giving money. By demonstrating the different effects of previous information, the current findings extended current understandings of donation behavior in terms of the number of donations and the amount of individual donations. On the one hand, individuals

tended to trust projects with more donors and contribute more individually; on the other hand, individuals wanted their donations to be more influential and were less willing to invest in projects that already have many donors. Third, the results are of interest to practitioners, demonstrating the harmful effects of displaying cumulative donation amount information. These findings can provide guidance for charitable fundraising and approaches for promoting donation behavior.

The remainder of this paper is organized as follows: section 2 introduces the data source platform, sampling and data analysis methods, section 3 presents the results, and section 4 presents the discussion and conclusions.

2. Methods

2.1 Review of Tencent charitable crowdfunding platform

In the current study, we crawled data from the Tencent Philanthropy platform website (https://gongyi.qq.com/succor/). Tencent Philanthropy is one of China's largest online charity crowdfunding platforms. The Tencent public donation platform launched in 2007. As of 31 December 2019, the platform supported more than 10,000 charities, and over 70,000 charitable fundraising projects. More than 300 million users have donated through the platform, with a total donation amount exceeding 7.6 billion yuan (US 1.1 billion dollars at the 2020 exchange rate).[4] These charitable projects cover various fields, including disease relief, poverty alleviation, disaster relief, educational assistance and nature protection.

On the donation page of the Tencent Philanthropy platform, in addition to basic information, including the project name and brief introduction, potential donors can see the prior donation information for the project, including the amount raised so far, the number of donors and the achievement rate. These data enabled us to study the dynamic impact of previous donation information on project fundraising performance. The additional information also includes images related to the project, the fundraising target amount, fundraising start date, and fundraising end date. Fig 1 shows a donation page presenting the list of charitable projects on the Tencent Philanthropy platform.

Donors can choose the project to which they wish to donate from the list of projects, using WeChat as an electronic payment method. Donors can see three recommended contribution amounts: 50 yuan, 100 yuan, and 200 yuan, and can also enter a custom amount. When creating a campaign, the fundraiser is required to fill in the registration information, including the project name, fundraising theme, project location, fundraising target, project image, and project brief description. The platform stipulates that a project will achieve the goal of raising funds or reach the fundraising finish date as the completion of the project. After the fundraising stage, a project can go into an allocation process. Projects can also have no target or end time. We observed that 97% of campaigns had a target or end time. Even if a project does not meet the fundraising target, all contributions are received after the end of the fundraising period. In addition, a project can continue to raise money even if the goal has been achieved. After the project completes fundraising, it is no longer included in the fundraising project list, and is placed in the completed project list. Every day, new projects are registered on the platform and included on the fundraising project list page; at the same time, some existing projects finish fundraising, and are removed from this page.

Each project has a fixed ID on the Tencent Philanthropy platform, which can be obtained from the details link of the project. The cumulative amount raised, the number of donors and the achievement rate for each project are updated in real time. We crawled the data at a fixed point in time at the end of the day, to obtain dynamic project data in units of days.

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[4] From Tencent Social Responsibility Report 2019 (https://gongyi.qq.com/jjhgy/jjhxxgk/zeren_2019.htm).

Figure 1. Donation page showing the list of charitable projects in the Tencent Philanthropy platform

Note: above is a list of charitable fundraising projects, with the information displayed about each project shown on the right. Potential donors browse the page and select the projects to which they wish to donate.

2.2   Data collection and measurement

We collected information about all projects being run on the Tencent Philanthropy website from June 16,2020 to July 16,2020, with a total of 31 days, 5638 projects and 134513 data points.

We directly captured data about project theme, project name, project ID, cumulative amount of donations, cumulative number of donors, accumulative achievement rate, target of fundraising, project start and finish time, project brief description, and project executor. Potential donors can sense whether a project is popular from the three types of data displayed on the website: prior cumulative amount of money raised, prior cumulative number of donors, and achievement rate of fundraising. A larger amount of money raised means that more funds have been raised, a higher cumulative number of donors means more people have contributed to the project, and a higher achievement rate indicates a greater degree of fundraising completion, and that the project is closer to completion. We sought to test whether projects with a greater amount of money raised, a larger number of donors, and a higher level of completion, attracted greater donation amounts and more donors.

We used these data to generate further information to examine conformity behavior. Because we crawled the donation status of each project per day for 31 days, we were able to use these dynamic data to obtain the cumulative amount of contributions the previous day, the cumulative number of donors the previous day, the achievement rate the previous day of the 2–31 days of each project, and to obtain new donations in units of days. Because we crawled the project status information of the day at the end of each day, the cumulative amount of contributions, cumulative number of contributions, and achievement rate variables we directly obtained included the new contributions received on the same day. We were able to obtain new contributions for the same day by subtracting the accumulated contributions from the previous day. By analyzing the relationship between the new amount on the same day and the state of project fundraising on the previous day, we were able to analyze how the project was affected by the state of the previous day, to determine whether people followed prior information about charitable donations. In addition, we explored the internal mechanisms underlying the effects of the state of the previous day's donations on new donation amounts. Because new donations were

actually obtained by multiplying the single donation by the number of donors, we were further able to analyze the impact of the previous day's donation status on single donations and the number of donors.

We examined the previous day's contribution status variable, with the previous day's cumulative donation amount, the previous day's cumulative donor number, the previous day's cumulative achievement rate as independent variables, rather than directly using the cumulative contribution status variable on each day. This avoided the interaction between dependent variables and independent variables, making the conclusions clearer. For example, assuming that the new amount on the same day could be used as the dependent variable, and that the cumulative amount on the same day could be used as the independent variable, because the new amount on the same day is part of the cumulative amount on the same day, this would be expected to affect the cumulative amount on the same day. The problem of endogeneity may affect this approach. Therefore, we used the cumulative amount of the previous day as an independent variable, meaning that the new contributions on that day would not affect the cumulative contributions of the previous day, avoiding the endogeneity problem. This meant that the conclusions drawn provided a better reflection of the influence of previous information. The variables used in the model are shown in Table 1.

Table 1.

Variable definitions

Variable	Description	Measurement
Amount	Amount of new donation received for a project on a particular day	$\text{Amount} = \text{Cumulative Amount of Donation}_t - \text{Cumulative Amount of Donation}_{t-1}$
Number	Number of new donors for a project on a particular day	$\text{Number} = \text{Cumulative Number of Donors}_t - \text{Cumulative Number of Donors}_{t-1}$
Amount Per Donation	Average of individual contributions received for a project on a particular day	$\text{Amount Per Donation} = \text{Amount}/\text{Number}$
Cumulative Amount of Donation $_{t-1}$	Cumulative amount of donation received as at day t-1 for a project	
Cumulative Number of Donors$_{t-1}$	Cumulative number of donors received as at day t-1 for a project	
Rate$_{t-1}$	Completion of a project as at t-1, the ratio of cumulative donations to funding targets	
Page	Page number of a project on website	
Target	Funding targets for a project	
Cumulative Fundraising Days	Number of days a project has been raised	Cumulative Fundraising Days = crawl date – start date

We screened the data obtained using the following criteria:

1. Only keep projects with complete 31-day dynamic data

To ensure the integrity of the study, only projects with 31 days of data were retained, and projects with less than 31 days of data were excluded. We grabbed all the projects listed on the webpage every day. Because there were new projects launched on the site at any time during the grab, and there were projects that ceased fundraising, the number of days of grabbing was between 1 and 30 days for each project. After excluding these items, the analysis included the remaining 3131 projects, with 97061 data points.

2. Only keep projects that started raising money in the previous 3 months from when the data were captured

To make the sample projects comparable and avoid deviation from comparing projects that started raising funds several years ago with those that started raising funds several days ago, we screened out projects that had been operational for an overly long or overly short duration. Only projects that started raising funds between April and June 2020 were retained. Combined with the first criterion, the sample items in this paper were raising funds for 1 to 3 months at the end of the grab. After excluding projects starting before March 2020, the remaining 1131 projects contained 35061 data points.

3. Delete data from June 16

To examine whether previous contribution information affected subsequent contributions, we used daily new donations as the dependent variable, and the previous day's cumulative contributions as the independent variable. The data from June 16 lacked the dependent variable, the amount of new donations and the number of new donors because new contributions were calculated as the difference between the cumulative amount of the day and the cumulative amount of the previous day, whereas June 16 was the first day of crawling, meaning the number of the amount of new donations and the number of new donors could not be calculated. Thus, only the cumulative collection data on June 16 were included, with no total collected on June 15, meaning we were not able to calculate the new collection on June 16. To address this issue, we deleted the data for June 16. After exclusion, 1131 items with 33930 data points remained.

Our dataset was balanced panel data with a total of 1131 items, each with 30 consecutive time points. Of the projects, 54.29%, 19.01%, 15.47%, 4.07% and 7.16% of projects were related to the themes of disease, poverty and disaster, education, environment, and other, respectively.

The average fundraising time for these projects on the last day of the data capture date was approximately 60 days. The minimum cumulative fundraising time was 30 days. The maximum cumulative fundraising time was 106 days. The average amount of new donations on the day was 403 yuan, with a wide distribution span (￥0, ￥0, ￥0.1, ￥10, ￥337401.4). The average number of new donors was more than 21 individuals, The average amount of a single donation was 17 yuan. The average achievement rate was 8.59%, with 0% at minimum and 97% maximum. The average fundraising target was ￥653056, goal settings varied widely between projects (￥0.01, ￥100000, ￥200000, ￥500000, ￥15300000). The standard deviation was very large. The average number of pages in the project was 93 pages, ranging from 0 to 155. We present the descriptive statistics of the variables in Table 2.

Table 2.

Descriptive statistics

Variable	Obs	Mean	Min	Max	Std. Dev.
Amount	33,930	403.1504	0	337401.4	4816.469
Number	33,930	21.22146	0	15661	292.8779
Amount Per Donation	33,930	17.27322	0	25740	254.1181
Cumulative Amount of Donation$_{t-1}$	33,930	33566.06	0	1579801	123524.9
Cumulative Number of Donors$_{t-1}$	33,930	1980.921	0	97226	7159.153
Rate$_{t-1}$	31,173	9.350881	0	97	17.16594
Target	31,173	653056	0.01	1.53E+07	1499776
Page	33,930	92.53177	0	155	41.34445
Cumulative Fundraising Days	1,131	59.54642	30	106	19.43613

Note：

1. The number of observations in the table was 33930, with a total of 1131 items for 30 days;

2. In the seventh row, the Target variable consisted of 31173 observations, because there were 1037 projects that did not change their targets over 30 days, 90 projects with no funding targets, one

project that cancelled its fundraising target 6 days later, one project that cancelled its fundraising target 15 days later and two projects that were cancelled after 21 days;

3. In the sixth row, the $Rate_{t-1}$ variable had 31173 observations because projects with no funding targets did not count toward the achievement rate;

4. For the CumRaiseDays variable, the last row only describes the cumulative fundraising time on the last day of the data capture date (i.e., the 30th day).

2.3   Analysis strategy

First, correlation tests and collinearity tests were carried out on the variables. Pearson's correlation coefficients between variables were below 0.9, indicating that there was no collinearity problem between variables. Second, the panel was tested for intra-group autocorrelation, inter-group heteroscedasticity and inter-group contemporaneous correlations. The test results revealed that there were three problems in the data. Thus, three problems were dealt with in the regression estimation of panel data.

Third, we selected the estimation model. The data set in this study included the fundraising status information of 1131 projects for 30 consecutive days, which was the micro panel data of time and project. To test whether individuals followed previous contributions, we estimated whether Cumulative Amount of Donation$_{t-1}$, Cumulative Number of Donors$_{t-1}$, and $Rate_{t-1}$ had positive effects on Amount. There are three main methods to test panel data: pooled regression models, fixed effects models and random effects models. In this study, we expected that a two-way fixed effects model would be most appropriate; however, for the sake of rigor, the three models were compared to select the most suitable model for this data set. In the process of model selection, the problems of intra-group autocorrelation, inter-group heteroscedasticity and inter-group contemporaneous correlation were considered. The test results revealed that there were unobserved individual effects, and the P-value in the Hausman test results was less than 0.001, so a fixed effects estimation method was used. The estimate results are presented in section 3.

Finally, we used two methods to test the robustness of results. First, we estimated the impact of previous information on subsequent contributions with different standard errors. The main body estimate results were under Driscoll-Kraay standard errors, which were compared with the results of Rogers standard error and White standard error in robustness tests. Second, we estimated the impact of previous information on subsequent donations in two subsamples. The data were divided into two subsamples according to the number of days raised. Sample 1 contained projects raised more than 45 days earlier, with 14446 observations. Sample 2 contained projects raised less than or equal to 45 days earlier, with 16727 observations. We sought to test whether the estimation results in the two subsamples were consistent with the main estimation results. The robustness test results are shown in section 3.

3.   Results

3.1   Impact of previous information on donation amount

First, we explored the impacts of information about previous donations on new donation amount. We used the Amount variable as the dependent variable. The fixed effects estimation results are shown in Table 3. The first column of data shows the negative impact of previous donation information on subsequent donation amount, and the second column of data shows that the negative impact of previous information was still significant after controlling for the page number of the project, the project target, and the number of days for which the project raised funds. Without controlling for any other variables, there was a negative relationship between the cumulative contribution amount of the previous day and the new amount of a day; when the Cumulative Amount of Donation$_{t-1}$ variable increased by 1%, Amount was reduced by 0.05%. In addition, there was a negative relationship between the cumulative achievement rate and the new amount, revealing that Amount was reduced by 66.03% for each increase in $Rate_{t-1}$. The cumulative amount and achievement rate of the previous day together demonstrated that, in the face of prior donation information, individuals exhibited anti-conformity behavior. The greater the amount already accumulated by a project, the lower the amount of subsequent contributions received.

There was no significant relationship between the cumulative number of donors on the previous day and the new amount added on that day, which appeared to indicate that the number of people who had already chosen a project did not have an impact on subsequent contributions. We explored the reasons behind this apparent lack of effect in more depth in further analyses.

Table 3.

Results of fixed effects model estimations (DV = amount)

	(1)	(2)
Cumulative Amount of Donation$_{t-1}$	-0.05***	-0.05***
	(0.000)	(0.003)
Cumulative Number of Donors$_{t-1}$	0.22	0.22
	(0.260)	(0.263)
Rate$_{t-1}$	-66.03***	-73.49**
	(0.008)	(0.045)
Page		4.08*
		(0.052)
Target		-0.00
		(0.749)
Cumulative Fundraising Days		106.97
		(0.554)
N	31173	31173

Note：p-values in parentheses，* p < 0.1, ** p < 0.05, *** p < 0.01

3.2   Impact of previous information on individual contributions and number of donors

Because daily new contributions are the product of the number of donors on the day and the individual amount per donation, to explore how previous information affects the decision-making of subsequent donors, in further analyses, we analyzed the effects of Cumulative Amount of Donation$_{t-1}$, Cumulative Number of Donors$_{t-1}$ and Rate$_{t-1}$ on the number of donors and the individual donation amount. The results of fixed effects estimation are shown in Table 4. Amount Per Donation is the dependent variable in the first two columns and Number is the dependent variable in the latter two columns.

The estimate results with individual contribution as a dependent variable were as follows: first, there was a negative correlation between the previous cumulative amount and individual contribution, project completion degree and new individual contribution number. Thus, the more contributions were already received and the higher the degree of project completion, the lower the subsequent individual contribution. Second, there was a positive relationship between the cumulative number of previous donors and individual contributions, meaning that a greater number of people donating to projects was associated with higher subsequent individual contributions. Importantly, this finding indicates that, although the basic analysis found that the number of donors did not significantly affect the monetary amount of new donations, this does not mean that the number of contributions had no impact on people's donation decisions. The estimated results were still valid after controlling for Page, Target and Cumulative Fundraising Days. Among the control variables, there was a positive relationship between page number and individual contributions, whereas the target and number of days had no significant impact.

The estimate results with the number of new donors per day as a dependent variable were as follows: first, there was no significant relationship between the previous cumulative amount and the number of new donors, and no significant relationship between the achievement rate of the project and the number of new contributions. Second, there was a negative relationship between the previous cumulative number of donors and the number of new donors; that is, the greater the number of people who had already donated, the smaller the number of new donors. Combined with the finding that projects with more donors attracted higher monetary amounts of subsequent single contributions, the results demonstrated that two effects of donor number on donation decisions were offset by one another. This offset effect created a surface phenomenon suggesting that the number of previous donors does not affect the amount of contributions. The estimated results were still valid after controlling for Page, Target and Cumulative Fundraising Days.

Table 4.

Results of fixed effects model estimations (DV = amount and DV = number)

Dependent Variable	Amount Per Donation		Number	
	(1)	(2)	(3)	(4)
Cumulative Amount of Donation$_{t-1}$	-0.00***	-0.00**	0.00	0.00
	(0.002)	(0.012)	(0.481)	(0.567)
Cumulative Number of Donors$_{t-1}$	0.00***	0.00***	-0.04**	-0.04**
	(0.001)	(0.001)	(0.044)	(0.044)
Rate$_{t-1}$	-1.37*	-1.41*	-2.90	-2.90
	(0.053)	(0.057)	(0.200)	(0.321)
Page		0.14**		0.03
		(0.050)		(0.737)
Target		0.00		0.00
		(0.911)		(0.994)
Cumulative Fundraising Days		0.32		2.82
		(0.825)		(0.844)
N	31173	31173	31173	31173

Note: p-values are shown in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Integrating the impact of prior donation information on Amount, Amount Per Donation, and Number in Table 5, our results were as follows: first, the cumulative amount of donations and achievement rate had a negative impact on new individual contributions, resulting in a negative impact of previous contributions on subsequent contributions. Second, the cumulative number of donors had a positive impact on individual contribution amounts, but had a negative impact on the number of donors. These two effects offset one another, resulting in the cumulative number of donors having no significant impact on the amount of new contributions. Third, the greater the page number, the greater the amount of single donations, resulting in a positive impact of page number on new contributions. Fifth, the target and number of days had no significant impact on donation behavior.

Table 5.

Conformity and anti-conformity effects in terms of money and number

Dependent Variable	Amount	Amount Per Donation	Number
	(1)	(2)	(3)
Cumulative Amount of Donation$_{t-1}$	-0.05***	-0.00**	0.00
	(0.003)	(0.012)	(0.567)
Cumulative Number of Donors$_{t-1}$	0.22	0.00***	-0.04**
	(0.263)	(0.001)	(0.044)
Rate$_{t-1}$	-73.49**	-1.41*	-2.90
	(0.045)	(0.057)	(0.321)
Page	4.08*	0.14**	0.03
	(0.052)	(0.050)	(0.737)
Target	-0.00	0.00	0.00
	(0.749)	(0.911)	(0.994)
Cumulative Fundraising Days	106.97	0.32	2.82
	(0.554)	(0.825)	(0.844)
N	31173	31173	31173

Note: p-values are shown in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The robustness test results are shown in Tables 6 and 7. Columns (1)(4)(7) in Table 6 show the results of Driscoll-Kraay standard error, columns (2)(5)(8) show the results of Rogers standard error, columns (3)(6)(9) show the results of White standard error tests. It can be seen from the table that the estimated results were robust. In Table 7, columns (1)(4)(7) show the results of the full sample estimate, columns (2)(5)(8) show the estimation results for sample 1, and columns (3)(6)(9) show the estimation results of sample 2. The subsample results were consistent with the results of all samples, which also reflects the robustness of the model results.

Table 6.
Robustness test results - standard errors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable	Amount			Amount Per Donation			Number		
standard error	Driscoll-Kraay	Rogers	White	Driscoll-Kraay	Rogers	White	Driscoll-Kraay	Rogers	White
Cumulative Amount of Donation$_{t-1}$	-0.05***	-0.05***	-0.05***	-0.00**	-0.00**	-0.00**	0.00	0.00	0.00
	(0.003)	(0.006)	(0.006)	(0.012)	(0.034)	(0.034)	(0.567)	(0.695)	(0.695)
Cumulative Number of Donors$_{t-1}$	0.22	0.22	0.22	0.00***	0.00**	0.00**	-0.04**	-0.04	-0.04
	(0.263)	(0.357)	(0.357)	(0.001)	(0.035)	(0.035)	(0.044)	(0.102)	(0.102)
Rate$_{t-1}$	-73.49**	-73.49	-73.49	-1.41*	-1.41*	-1.41*	-2.90	-2.90	-2.90
	(0.045)	(0.154)	(0.154)	(0.057)	(0.072)	(0.072)	(0.321)	(0.475)	(0.475)
Page	4.08*	4.08**	4.08**	0.14**	0.14***	0.14***	0.03	0.03	0.03
	(0.052)	(0.049)	(0.049)	(0.050)	(0.004)	(0.004)	(0.737)	(0.793)	(0.793)
Target	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.749)	(0.735)	(0.735)	(0.911)	(0.900)	(0.900)	(0.994)	(0.994)	(0.994)
Cumulative Fundraising Days	106.97	8.00*	8.00*	0.32	-0.11	-0.11	2.82	0.22	0.22
	(0.554)	(0.080)	(0.080)	(0.825)	(0.455)	(0.455)	(0.844)	(0.521)	(0.521)
N	31173	31173	31173	31173	31173	31173	31173	31173	31173

Note: p-values are shown in parentheses,* p < 0.1, ** p < 0.05, *** p < 0.01

Table 7.
Robustness Test Results – Subsample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable	Amount			Amount Per Donation			Number		
Sample	All	sample1	sample2	All	sample1	sample2	All	sample1	sample2
Cumulative Amount of Donation$_{t-1}$	-0.05***	-0.03*	-0.10***	-0.00**	-0.00**	-0.00**	0.00	0.00***	0.00
	(0.003)	(0.054)	(0.000)	(0.012)	(0.044)	(0.026)	(0.567)	(0.001)	(0.248)
Cumulative Number of Donors$_{t-1}$	0.22	-0.27*	0.79	0.00***	0.01**	0.01***	-0.04**	-0.14***	-0.07**
	(0.263)	(0.074)	(0.104)	(0.001)	(0.046)	(0.001)	(0.044)	(0.002)	(0.012)
Rate$_{t-1}$	-73.49**	25.76	-63.54	-1.41*	-0.22	-2.00	-2.90	3.59**	-2.82
	(0.045)	(0.541)	(0.230)	(0.057)	(0.882)	(0.113)	(0.321)	(0.020)	(0.499)
Page	4.08*	4.00**	6.17**	0.14**	0.13	0.15*	0.03	0.12***	0.03
	(0.052)	(0.023)	(0.027)	(0.050)	(0.153)	(0.077)	(0.737)	(0.007)	(0.763)
Target	-0.00	-0.01**	0.01	0.00	-0.00	-0.00	0.00	-0.00**	0.00
	(0.749)	(0.046)	(0.365)	(0.911)	(0.822)	(0.588)	(0.994)	(0.028)	(0.399)

Cumulative Fundraising Days	106.97	229.70**	9.92*	0.32	0.58	-0.25***	2.82	8.92***	0.35
	(0.554)	(0.016)	(0.087)	(0.825)	(0.663)	(0.000)	(0.844)	(0.000)	(0.568)
N	31173	14446	16727	31173	14446	16727	31173	14446	16727

Note: p-values are shown in parentheses,* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.   Discussion and conclusion

The current study demonstrated how previous information about the monetary amount of individual donations and the number of previous donors affects subsequent contributions. The results revealed anti-conformity behavior of individuals in response to information about the donation amount, as well as simultaneous conformity and anti-conformity behavior in response to information about the number of donors. Our main conclusions are discussed below.

First, we observed anti-conformity behavior in charitable crowdfunding, demonstrating that the larger the cumulative amount of donations or the higher the degree of completion, the smaller the subsequent individual donation amount. In addition, the greater the cumulative number of donors, the smaller the number of subsequent donors.

One possible reason for this phenomenon is that people may have felt that the impact of their donations was diluted when many people donated to the same project. Experiments by Cryder, Loewenstein and Scheines (2013) revealed that tangible information can increase generosity, enhancing individuals' perceptions of the impact of their donations (Cryder, Loewenstein, & Scheines, 2013). Thus, people may be less generous if they believe that their donations will be less influential. van Teunenbroek, Bekkers and Beersma (2020) also argued that perceived influence explains why people do not follow information about previous donors; some donors pay attention to their contribution influence, and information about prior donors makes them feel that their contribution will not make a substantial difference in terms of achieving the target amount, decreasing the perceived impact of their donation on the total amount raised, so they reduce their donations (van Teunenbroek et al., 2020).

The current results are consistent with those of Burtch, Ghose, and Wattal (2013), who reported that higher contribution frequencies were associated with lower subsequent contribution amounts. The researchers proposed that, when donations become less important to recipients, the marginal utility of donations from donors decreases (Burtch et al., 2013). The current results support this conclusion. In addition, our results are consistent with those of Gleasure and Feller (2016), who reported that the number of contributions per day, for individual projects, provide a negative forecast of total contributions. Donors are less inclined to donate to projects with a high density of contributions from other donors. The researchers proposed that greater density dilutes the interpersonal link between individual donors and fundraisers (Gleasure & Feller, 2016). The current findings support this conclusion. However, our findings extend this notion, revealing that, in addition to the negative impact of the number of donors, there was a positive impact on individual donation amounts, despite the negative impact playing a major role.

The current results were inconsistent with those of Burtch et al. (2018), who reported that the accumulation of donations increased the amount of donations. Conversion of visitors and the amount of donations have been reported to be positively related to prior capital accumulation, and Yue Chen, Zhang, Yan, and Jin (2020) found that campaign popularity and herding effects both had progressively increasing influences on fundraising performance. The current findings revealed that the accumulation of previous contributions reduced the amount of donations. This discrepancy may have arisen because the data used in the two previous papers were from reward-based crowdfunding whereas the current data were from donation-based crowdfunding and individuals' goals and motivations may differ between the two scenarios. The current findings also indicated that individuals' donation behavior in donation-based crowdfunding and reward-based crowdfunding are inconsistent, and charitable crowdfunding is an area that requires special research. Our results were also inconsistent with those of Liu, Suh, and Wagner (2018), who reported that the popularity of a project was positively correlated with sympathy, which was positively correlated with donation intention. It can be inferred from their conclusion that the greater the popularity of a project, the greater the intention of people to contribute to it. However, we found that the more prior donors, the less people contributed to the project. There are at least two potential reasons for this inconsistency. First, the studies used different indicators to measure project popularity. Liu et al. (2018) used "like" behavior, share behavior, and comment behavior to measure popularity. In contrast, we used the amount of contributions received by the project and the number of donors to measure the popularity of projects. Second, different stages of donation were studied. Liu et al. (2018) analyzed the intention of people to donate before they donated, whereas we analyzed the behavior that people showed after they donated. In addition, Liu et al. (2018) study was based on a

questionnaire in which the subjects, whether or not they had donated money, were asked to recall the recent charitable fundraising projects they had read about. In contrast, we used actual donation data obtained by crawling the crowdfunding platform's website. Taken together, the findings of the two studies suggest that donation intentions and actual behavior are different. This difference may arise from people's tendency to be affected by situational factors in actual donation activities. This finding is a reminder for practitioners that the presentation of their donation strategy and design affects people's donation behavior.

One previous study reported that the closer a project was to completion, the greater and more frequently contributions were received (Argo et al., 2020). This may be because people feel positively about the sense of achievement when campaigns are completed. However, the current findings revealed that the higher the achievement rate, the smaller the amount of individual contributions. This finding may have been related to our inclusion of many projects that were not close to completion, with the degree of completion ranging from 0% to 97%, with most projects at a low level of completion (average degree of completion: 9%). This result, however, raises an interesting possibility in conjunction with our other findings: as completion ranges from 0% to 100%, individual's contributions may exhibit a U shape, meaning that, as progress increases, people might feel that their influence is diluted and their contributions are reduced; however, as projects move towards completion, people might wish to personally be involved in reaching fundraising targets, causing donations to begin to increase again.

Second, we observed that projects that had already been chosen by more people resulted in larger subsequent individual donations. This finding indicated that people followed the choices of their predecessors in making decisions about how much to donate. One possible explanation is that projects with more prior donors gain individuals' confidence and trust, increasing their willingness to donate a larger amount. Bekkers and Wiepking (2010) suggested that when people see others donating money to a project, they will perceive a signal that others have confidence in the project. Y. Chen et al. (2019) administered questionnaires, revealing that trust was positively correlated with the amount of monetary donation.

Third, conformity and anti-conformity effects were found to offset one another. When more donors led to larger individual contributions, this resulted in a smaller number of subsequent donors, creating a zero net effect on the total donation amount. One explanation for this simultaneous positive and negative offset is the perceived efficacy signal of a project felt by potential donors and the intensity of the need for help. Bekkers and Wiepking (2010) proposed that if the need for donation was perceived as lower because of the increase in contributions by others, donors may lower their own contribution. This tendency, however, may be offset by the quality signal communicated by the donations of others. The current results represent the first quantitative evidence supporting this theory. The finding of the offset between positive and negative effects is the main contribution of this study to previous literature.

Finally, the current results revealed that target and raised days had no impact on individual donation amounts or the number of donors. The finding that the goal did not affect donations is consistent with the findings of Gleasure and Feller (2016), who reported that the goal and the donation amount were not related in individual fundraising projects. Moreover, the current results support the findings of Yang, Liu, and Yin (2019), who crawled data from environmental charity crowdfunding projects on the Tencent Philanthropy platform, finding that when goal setting and project duration were at low and moderate levels, they were not always likely to have a significant impact on project success.

Although few previous studies have focused on conformity behavior in charitable crowdfunding, Sasaki (2019) analyzed data from a Japanese donation-based crowdfunding platform, JapanGiving, reporting that donor herd behavior was more likely to occur when more people donated similar amounts. However, Burtch et al. (2013) findings based on online journalism project crowdfunding data do not support the notion that people follow others to donate; on the contrary, the researchers found that, when individuals observed more frequent donations from others, their donation amount decreased. Because Burtch et al. (2013) also examined public projects, their findings may also be applicable to donation-based crowdfunding. The current results indicated that conformity and anti-conformity behavior exist at the same time, but that the anti-conformity effect was more important. First, we found that individuals did exhibit conformity behavior, and projects with more donors tended to receive larger subsequent individual donation amounts. However, at the same time, anti-conformity behavior was exhibited; when people observed a larger amount of donations, individual donation amounts were

reduced. In addition, when more people were observed to donate to a project, the number of subsequent donors also became smaller. These two effects were expressed in combination.

In conclusion, the current study provided evidence that individuals are influenced by other individuals' behavior in crowdfunding donations, revealing simultaneous positive and negative effects of previous information on subsequent donation behavior, and extending current literature on donation behavior. In addition, the current findings provide suggestions to practitioners that excessive display of previous information is not conducive to promoting donation behavior.

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