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The Content Influence Mechanism of the Behavior of Poverty Alleviation Crowdfunding Users: An Empirical Study of A Chinese Crowdfunding Platform

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Short Research Paper

The Content Influence Mechanism of the Behavior of Poverty Alleviation Crowdfunding Users: An Empirical Study of A Chinese Crowdfunding Platform

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Abstract: Poverty alleviation crowdfunding is an "E-commerce + Agriculture + Crowdfunding" innovative mode, which promotes the targeted poverty alleviation and rural economic development in China. Previous researches mainly focus on non-content elements (e.g., the number of comments and praise) while publications are rarely related to content elements. We suggest that content elements (e.g., text of products) also have an important role in helping users to make different decisions (i.e., purchasing or donating). We select antipoverty programs in JD as a sample and adopt the linear regression model to analyze the influence of text type on the behavior of crowdfunding users. Specifically, the experimental results indicate that the emotion text (ET) make users tend to donate while the product text (PT) make users tend to purchase. This study will help project sponsors to achieve better effects on poverty alleviation by adjusting the ratio of ET to PT.

Keywords: user behavior, text feature, poverty alleviation, crowdfunding

1. INTRODUCTION

Crowdfunding refers to a fundraising channel through which the fundraiser can integrate resources of the mass public via the Internet to provide fund assistance for certain activities performed by other organizations or individuals [1]. Compared to traditional fundraising approaches, crowdfunding has fewer restrictions and higher financing efficiency[2]. crowdfunding can be categorized into four types: reward-based, equity-based, loan-based and donation-based[3]. Poverty alleviation crowdfunding includes the characteristics of two crowdfunding models: reward-type and donation-type. Once a project is successfully implemented, the reward-type of investors will get products, while the donation-type will not [4],[5]. Reward-type of crowdfunding offers an investment opportunity associated with a consumption experience [6] where consumers can choose the amount they give to a project which allows individuals to reveal their valuation about a certain product.

Previous researches mainly focus on the reward-based model [7] and donation-based model of crowdfunding [8], and little attention has been paid to. The combination of two crowdfunding model where there are explicit project or non-project gains for the project backers. The development in Web 2.0 has propelled the growth of crowdfunding platforms, which integrate the requests for reward-based or donation-based under one domain and make it available to everyone who is interested in Poverty alleviation crowdfunding. There are several online crowdfunding sites that host crowdfunding projects combine charitable and reward-based such as KickStarter, Ulule, Taobao and JD.Therefore, we review one e-commerce platform, named “JD” to be the research object. Specifically, we seek to answer two research questions: (1) Do crowdfunding investors prefer purchase or donation? (2) What are the factors that influence crowdfunding users to make donation or consumption decisions?

Crowdfunding’s fundamental purpose is to ensure the successful implementation of the project. The success of crowdfunding projects does not only depend on the financial performance but also the number of

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project backers. However, few research has analyzed the mechanisms of project backer's number to crowdfunding projects' success. Scholars have conducted a series of research in raise funds, they [9]-[11] tried to explore determinants of crowdfunding performance and delineate the influence of non-content characteristics on the financial performance of crowdfunding projects. These works help to understand the non-content elements related to financing performance, but they often overlook the influences of the content characteristics. The role of the text is important as project creators could to persuade the potential backers with a convincing story, and push project backers to make crowdfunding decision. Research on the content characteristics of the crowdfunding projects is limited [12]-[14]. In our exploration, we try to demonstrate how different types of item description appeals in a textual message influence the project backer's decisions.

2. MATERIAlLS AND METHODS

In existing research, influencing factors of user's crowdfunding decision were usually categorized into two types: non-content factors or content factors. The non-content factors refer to the elements that irrelevant to the description information on the project interface, (e.g., social capital of fundraisers, project duration and funding goals). In contrast, content factors refer to the elements that description information of project, which can be divided into emotion text (ET) and product text (PT), these two types of content factors play different roles in crowdfunding decision of project backers.

ET refers to the description information full of personal feelings, which describes personal circumstances and shows the identity of special groups, (e.g., poor farmers) and uses a positive or negative narrative tone. We identify language indicative of positive or passive psychological capital: consisting of failure, risk and achievement, as an important emotional signal in poverty alleviation crowdfunding. The personal background description of the project creators is an important basis for project backers to make donation decisions. Personal background intends to constructs project creator's "weak" identity through the description of their social identity, occupation and economic status, so as to constructs its "weak" identity in the society and stimulates the compassion of the donor and obtain a better fund-raising effect.

We found that women related words (e.g., daughter and mother) appear in the emotion text of crowdfunding projects will inspire the trust and empathy of crowdfunding users to make donation decisions [8]. The emotional text of the project creators can improve the accuracy of crowdfunding project performance prediction [15] , and the background information can produce good charitable results [16] . In total, the longer ET, the more empathic users will be aroused, and users will be inclined make donation decisions. Accordingly, we propose two hypotheses as shown in Figure 1:

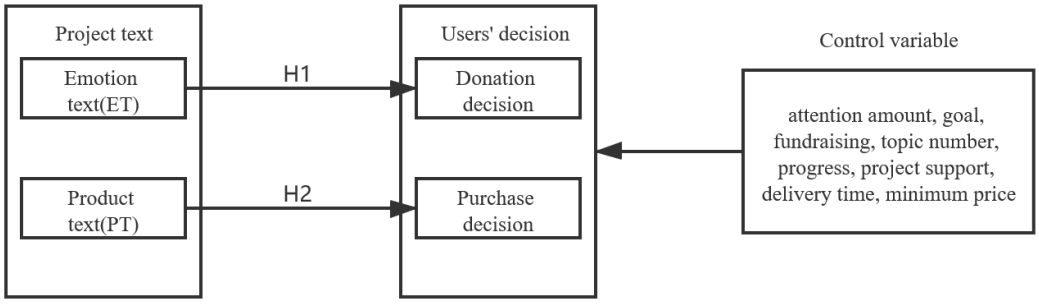

Figure 1. Theoretical framework

H1: The presence of emotion text (ET) in a Poverty alleviation crowdfunding project is positively related to

the project backer likelihood of making a donation decision.

PT refers to the overall description of the product parameters, including the detailed characteristics, brand, functions and place of origin, which is more objective than the ET. The description of PT, including product parameters needed to be identified by project backers, such as appearance, taste and quality etc.

For project backers, product text is an important way to understand products and make consumption decisions. The study found that the use of specific and accurate description in crowdfunding projects can make project backers more aware of the project, enable project backers to make consumption decisions [17] . Project backers possess greater ability and motivation to make careful evaluations on crowdfunding projects, when there is objective evidence about the quality of the product, the specific benefits and costs of the product [13] . Project backers need to rely on a large number of product texts for the comparison and selection of crowdfunding products. The presentation of these product texts is a "signal" sent by the project sponsor. With the help of product texts, Project backers can have a better understanding of products, which has an important impact on user crowdfunding decision-making. Therefore, the longer the PT, the more product information will be provided, and crowdfunding users will be inclined make purchase decisions. Thus, we propose the following:

H2: The presence of product text (PT) in a Poverty alleviation crowdfunding project is positively related to the project backer likelihood of making a purchase decision.

Prior studies on crowdfunding have indicated that non-content factors are important predictors of success of crowdfunding projects. Thus, we use the presence of some non-content factors as control variables in this analysis.

We recorded the project data, that include 14 information, apart from the textual requests, the data also contain additional project information such as history of posts, comments, and his/her account age, of all the projects on this platform From January 2015 to October 2019. Using the crawlers Python converted to a comma separated values file format and removing the projects with missing information. Finally, we obtain detailed data of 583 projects with poverty alleviation.

The proportion of different types of text in the total text reflects the attention of project creators to different attributes of poverty alleviation crowdfunding projects, which further affects the decision-making between user consumption and donation. Therefore, we make detailed statistics on the number of words of emotion text (ET) and product text (PT) to support subsequent experiments.

3. RESULTS

3.1 Variable descriptions and measurements

3.1.1 Dependent variable

We explore the degree of user's inclination between donation decision-making and purchase decision-making. In line with this research, we also operationalize crowdfunding user’s decision as a continuous variable measuring the number of committed to the project by investors called funds raised. The increase or decrease of the number of crowdfunding users can directly reflect the user's inclination of decision-making. Therefore, we use the proportion of donators FD% (free donation), and the percentage of purchasers PD% (purchase donation) as the index to measure the user's inclination of decision-making. If FD% increases, it indicates that the crowdfunding users tend to make donation decisions, otherwise, it indicates that the crowdfunding users tend to make purchase decisions (PD% + FD% = 1).

3.1.2 Explanatory variables

For the sake of describing the level of detail in the project text and eliminating the effects of other factors on the decision of crowdfunding users, we apply ET % as a measure index of how much emotional text occupies the full length, and the PT% is take as a measure index of how much product text occupies the full length. When

the ET% of crowdfunding project is more than 50%, it is considered that the description of the project is dominated by the emotional text. When the ET% of crowdfunding project is less than 50%, it is considered that the description of the project is dominated by the product text (PT) (PT% + ET% = 1).

3.2 Data analysis

3.2.1 Summary statistics of variables

The descriptive statistics and the summary of the variables in this paper are shown in Table 1. The mean of the funding goal is ￥21759.55, the funding goal has a maximum value span ranging from ￥38 to ￥1,000,000, indicating that the fund expectation of project sponsors varies greatly. Concerning the length of project text, the mean length of emotional text is 713.7 and the mean length of product text is 584.78. From Table 2, the means of donators and purchasers are 130.4 and 586.19, respectively. we notice that the number of consumers is significantly more than the number of donors. The standard deviation of donators and purchasers are much higher and more unbalance.

Table 1. Summary statistics of variables

	Min	Max	Mean	Std. Dev	Obs.
DA	0	8620	130.04	700.875	583
PC	4	76577	586.19	3278.439	583
*lg*FD%	0	0.9850303	0.1033138	0.180438125	583
*lg*PD%	0.015	1	0.8966862	0.180438125	583
GL	38	1000000	21759.55	61332.767	583
FR	1340	1058069	69032.42	134078.614	583
PG	18	16727	540.4974	1266.34721	583
PT	30	2490	713.7	358.887	583
ET	0	3652	584.78	382.544	583
PT%	0.019	1	0.5598272	0.184931768	583
ET%	0	0.9809765	0.4401728	0.184931768	583
AT	5	4000	163.84	337.602	583
PS	0	974	10.78	71.019	583
TP	0	953	31.46	59.471	583
DT	1	299	14.17	20.471	583
LP	0	798	47.2	65.664	583

DA: Donator, PC: Purchaser, GL: Goal, FR: Fund-raising, PG: Progress, AT: Attention amount, PS: Project support, TP: Topic number, DT: Delivery time, LP: Lowest price

Our funds raised independent variable followed a right skewed, gamma distribution, which presents analytical challenges. For variables with non-zero values we used a natural log transformation to correct for this skewness. This transformation allows us to interpret variables transformed using the natural log and those using the inverse hyperbolic sine transformation in the same way. Positive psychological capital, funds raised, created, Facebook friends, and backed were all transformed using the inverse hyperbolic sine transformation.

For the purpose of improving the regression fit, and make dependent variables present normal distribution, eliminate the heteroscedasticity problem, and do not change the relative relationship between variables, we log-transform dependent variable with the equation lg(original value). in the later model, the variables FD and PD are log converted, *lg*FD% and *lg*PD% are used as dependent variables. We delete the variables of original value is 0, and ensure that all the variables are valid.

3.2.2 Variable correlation analysis

Interactions are provided in Table 2 below. provides the correlation between the variables. It can be seen that the correlation (γ = -1.000, P = 0.00<0.01) is between *lg*FD% and *lg*PD%, it is a relation of completely negative correlation. Because the product text (PT) and emotion text (ET) constitute the overall text information of the project. It is normal to observe a high correlation (γ = 0.292, P = 0.000 < 0.001) between ET% and *lg*FD%. From Table 2, between PT% and *lg*PD% have the high correlation γ = 0.32, P = 0.001 < 0.05. Meanwhile, we believe that the goal (γ = -0.04, P = 0.34 > 0.05), fundraising progress (γ = 0.064, P = 0.121 > 0.05), attention amount (γ = -0.079, P = 0.057 > 0.05), support form project creator (γ = 0.025, P = 0.548 > 0.05), topic number (γ = -0.059, P = 0.158), expected return delivery time (γ = 0.029, P = 0.485 > 0.05) and minimum price (γ = 0.007, P = 0.86 > 0.05) are unrelated to the ET%.

Table 2. Variable correlation matrix

	Variables	1	2	3	4	5	6	7	8	9	10
1	*lg*FD%	1									
2	*lg*PD%	-.593** 0	1								
3	ET%	.292** 0	-.132** 0.001	1							
4	PT%	-.292** 0	.132** 0.001	-1.000** 0	1						
5	GL	-.113** 0.008	0.057 0.166	-0.04 0.34	0.04 0.34	1					
6	FR	.093* 0.03	-.286** 0	0.064 0.121	-0.064 0.121	-0.063 0.131	1				
7	AT	-.240** 0	0.068 0.101	-0.079 0.057	0.079 0.057	.142** 0.001	.199** 0	1			
8	ST	.182** 0	-.334** 0	0.025 0.548	-0.025 0.548	-0.024 0.568	.135** 0.001	-0.001 0.979	1		
9	TP	-.222** 0	-0.007 0.861	-0.059 0.158	0.059 0.158	0.017 0.69	.548** 0	.380** 0	0.054 0.192	1	
10	DT	.113** 0.008	-.088* 0.035	-0.029 0.485	0.029 0.485	.194** 0	-0.06 0.145	0.025 0.554	-0.007 0.869	0.036 0.389	1
11	LP	.286** 0	-.114** 0.006	-0.007 0.86	0.007 0.86	-0.024 0.568	-0.063 0.126	-.109** 0.008	-0.051 0.215	-.084* 0.042	.161** 0

GL: Goal, FR: Fund-raising, AT: Attention amount, ST: Supporter, TP: Topic number, DT: Delivery time, LP: Lowest price

All correlations with an absolute value greater than (0.05) are significant at p < 0.05 and an absolute value greater than (0.07) at p < 0.01.

3.3 Empirical Model

According to the qualitative analysis above, we construct the econometric model, we use a Hierarchical regression model with robust standard errors. To better appreciate the impact of content factors and non-content factors, we run three different models, that is Model 1, Model 2 and Model 3. Model 1 is the controls only model. We incrementally add the non-content factors to analyze the impact of the crowdfunding users of donation or purchase decision, expressed as formula (1) and formula (2). Model 2 highlights the scenario where we study the emotional text (ET) on the crowdfunding users of donation decision, expressed as formula (3). Model 3 considers

the product text (PT) on the crowdfunding users of donation decision, expressed as formula (4).

Model lists look like this:

- Model 1 (Controls only model)

$$lg\text{FD\%} = \alpha_0 + \alpha_1\text{Fundraising} + \alpha_2\text{Progress} + \alpha_3\text{Attention} + \alpha_4\text{Support Projects} + \alpha_5\text{Project Topics} + \alpha_6\text{DeliveryTime} + \alpha_7\text{Lowest Price} + \varepsilon \quad (1)$$

$$lg\text{PD\%} = \alpha_0 + \alpha_1\text{Progress} + \alpha_2\text{Support Projects} + \alpha_3\text{Delivery Time} + \alpha_4\text{Lowest Price} + \varepsilon \quad (2)$$

- Model 2 (ET on the crowdfunding user's donation decision)

$$lg\text{FD\%} = \alpha_0 + \alpha_1\text{Fundraising} + \alpha_2\text{Progress} + \alpha_3\text{Attention} + \alpha_4\text{Support Projects} + \alpha_5\text{Project Topics} + \alpha_6\text{DeliveryTime} + \alpha_7\text{Lowest Price} + \alpha_8\text{ET\%} + \varepsilon \quad (3)$$

- Model 3 (PT on the crowdfunding user's donation decision)

$$lg\text{PD\%} = \alpha_0 + \alpha_1\text{Progress} + \alpha_2\text{Support Projects} + \alpha_3\text{Delivery Time} + \alpha_4\text{Lowest Price} + \alpha_5\text{PT\%} + \varepsilon \quad (4)$$

3.4 Estimation Results

Table 3. Estimation Results

Variables	Model1		Model2	Model3
	*lg*FD%	*lg*PD%	*lg*FD%	*lg*PD%
FR	-0.082* 0.032		-0.081* 0.028	
PG	0.291** 0.000	-0.258** 0.000	0.261** 0.000	0.251** 0.000
AT	-0.141** 0.001		-0.126* 0.001	
PS	0.172** 0.000	-0.307** 0.000	0.170** 0.000	-0.305** 0.000
TP	-0.317** 0.000		-0.288 0.000	
DT	0.115* 0.003	-0.084* 0.027	0.114* 0.002	-0.087* 0.021
LP	0.248** 0.000	-0.132** 0.001	0.250** 0.000	-0.132** 0.000
ET%			0.244** 0.000	
PT%				0.112* 0.003
R^2	0.257	0.199	0.315	0.211
Adjusted- R^2	0.247	0.193	0.305	0.204
D-W	1.900	2.039	2.059	2.071
F	26.441	35.845	30.737	30.914
VIF			1.021	1.005

FR: Fund-raising, PG: Progress, AT: Attention amount, PS: Project support, TP: Topic number, LP: Lowest price, DT: Delivery time *p<.05; **p<.01.

Table 3 provides the estimation results for all three models. Model 1 studies the impact of control variables only. Model 2 considers the emotional text (ET) on the influence of crowdfunding user's decision of a donation. Model 3 considers the product text (PT) on the influence of crowdfunding user's decision of purchase. Table 3 reports the coefficients of the hierarchy regression and some of the fit statistics (R^2 , Adjusted- R^2 , and D-W). We specify two forms of R^2 in our research. The values of VIF is less than 5, which not strong enough to evoke the problem of multi-collinearity. The D-W values of the three models are all around 2. It is proved that there is no sequence correlation.

It can be seen from the regression results that the overall fitting effect of model 1 (1) is better（ $R^2 = 0.257$）. Then, add the explanatory variable ET% to the model 2, the linear regression effect of ET% is significant (β = 0.244, P = 0.000 < 0.001), and R^2 is increased, the overall effect of the model is improved ($R^2 = 0.315$). It is proved that the emotional support text can significantly affect the crowd funding users who are more inclined to make donation decisions. The significance of emotional text implies that H1 is supported. H1 illustrates the importance of emotional text appeals for persuading crowdfunding users to donate.

Similarly, the overall fitting effect of model 1 (2) is good ($R^2 = 0.199$). When the explanatory variable PT% is added to the model, model 3 is obtained. At this time, the linear regression effect of explanatory variable PT% is significant ($\beta = 0.112$, P=0.003<0.05), and R^2 increases, the overall effect of the model is improved (R^2 =0.211), which proves that product description text can significantly affect crowdfunding users' preference to make consumption decisions. We find support for H2, and it indicates that the presence of product text in a crowdfunding project has significant impact on the success of product purchase.

4. CONCLUSIONS

Our research illustrates the importance of textual factors in determining the success of a user's decision in an online platform. Based on the content categorization, we further expound on the emotional text, and product text appeals amongst the content features. We show content categories (ET vs. PT), have a significant impact on the likelihood of the user's crowdfunding decision. Specifically, we find that presence of emotion text increases the probability of user's donate intention, and product text can stimulate the users' to make a purchase intention decision, it positively impacts the likelihood of decision success. Our research will be beneficial to all those project creators who post their requests on crowdfunding platforms.

Our study is the first to investigate content text as an important influence factor and explore its role in the entrepreneurial fundraising process. For scholars, our study advances understanding of the determinants of successful crowdfunding campaigns - introducing content text as an important theoretical lens for understanding crowdfunding user's decision. Our study also underscores the importance of considering the interactions of two crowdfunding model, versus studying one model in isolation. For creators, our research suggests that creators would benefit from proactively signaling emotion content and product content when raising funds through crowdfunding. We hope that these findings and their associated implications lead to further academic inquiry regarding the role of content factor in poverty alleviation crowdfunding.

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