

Do Management Responses really matters in Crowdfunding? A Cue Diagnosticity Perspective

Research-in-Progress

Zhaona Geng

Qingfei Min

Lixia Hu

Abstract

With more and more business happening on the digital platform, management response has become increasingly important. However, empirical research investigating the effects of multiple management responses on digital platforms remain rare. In this study, we differentiate management responses in crowdfunding platform into undirected update and directed response according to communication modes. Drawing on cue diagnosticity framework, we examine how high-scope cues (updates) and low-scope cues (responses) are combined or integrated in the process of backers' investment. Besides, we also explore the role of multiple management responses at different stages of a project as prior studies suggest factors that affect backers' behaviors are different over the funding cycle. This study could yield insights for fundraisers to optimize their management response strategies and in turn, help them raise enough money to get projects off the ground.

Keywords: management response, cue diagnosticity, crowdfunding

Introduction

Emerged as a new channel for fundraisers to raise money, crowdfunding has grown rapidly in the past decade (Mollick 2014). As a report shows, crowdfunding market is estimated to raise \$34.4 billion in 2015 alone (Massoltion 2015). Despite the rapid growth of scale, the success rate of crowdfunding projects is relatively small(Yuan et al. 2016). For example, a report from Statistica indicates that only 35.79% of projects on Kickstarter can reach their initial goals as of April 2017. So it is necessary to investigate the mechanism and factors that determine whether backers will sponsor a project.

Scholars have found information cues such as duration, funding target and so on can affect backers' investment decisions (Kim et al. 2017; Kunz et al. 2016; Mollick 2014). However, most studies focus on cues that determined before projects are launched or cues generated by other backers during the funding. Signals sent by fundraisers during the funding, including updates and responses, are often ignored.

Serving as ways to keep in touch with backers, updates and responses can be regarded as two types of management responses (MRs) from fundraisers. Update is undirected MR for entire backers, while response is directed MR that target a specific backer(Goh et al. 2013). Scholars have reach consensus

that regular undirected updates can serve as a key driver of project success (Block et al. 2016; Li et al. 2018) and directed responses to comments will have positive effect on firm performance (Tsz-Wai Lui 2018; Woo Gon Kim 2015). But there is relatively little understanding of how backers' investment decisions may be different when multiple management responses are integrated in assessments of project quality. Thus, this paper aims to analyze the relative effect of multiple management responses (updates and responses) that generated during the project, which could provide better guidance for fundraisers.

According to cue diagnosticity framework, management responses in crowdfunding can be categorized into high-scope updates and low-scope responses. Compared with low-scope responses, high-scope updates usually are perceived to be more credible and consequently more diagnostic. The diagnosticity of low-scope responses depends on the high-scope cues, but there are mixed results that suggests high-scope cues can either enables or disables low-scope cues (Akdeniz et al. 2013; Gwebu et al. 2018; Miyazaki et al. 2005; Purohit and Srivastava 2001; Utz et al. 2012). So it's necessary to investigate the interaction of different management responses to better understand their relative effect. Besides, as backers' behaviors at different stages of a project have huge discrepancies (Kuppuswamy and Bayus 2017), we also take the stages of funding cycle into consideration.

To the end, our study mainly wants to embrace cue diagnosticity framework to investigate the effect of different management responses in stimulating prospect backers' investment decisions. More specifically, we study: (1) *whether updates and responses will affect prospect backers' investment decisions?* (2) *Whether the impact of updates is greater than responses?* (3) *What's the relative effect of updates and responses?* (4) *Whether the effect differs during different stages of funding?*

Literature Review

Previous literatures on Crowdfunding

Crowdfunding helps fundraisers pool funds from backers worldwide via digital platform (Ajay Agrawal 2015). Unlike professional investors in traditional markets, backers in crowdfunding markets usually have limited experience and have to rely on information cues to make decisions (Belleflamme et al. 2014). For example, early studies have found listed project features such as fundraising target, duration and so on are crucial drivers of backers' investment decisions (Kim et al. 2017; Kunz et al. 2016; Mollick 2014). However, most of these literatures focus on pre-funding cues determined by fundraisers before projects are launched.

For a better understanding of backers' investment decisions, an increasing body of researches turn to analyze cues generated during the funding (Thies et al. 2016; Vismara 2018). For example, Vismara (2018) found contributions in the early days of offering, which was known as information cascades among backers, play a crucial role in crowdfunding campaigns. Beside the dynamics of real funding behavior from other backers, Thies et al. (2016) also considered the effect of opinion-based eWOM information, finding that both types of social interaction have critical influence on backers' investment decisions. But all of these during-funding cues are generated by other backers rather than fundraisers. In most crowdfunding platforms, fundraisers are allowed to provide updates and comment responses to promote their projects (Xiao and Yue 2018). However, a comprehensive view on the effects of these cues is lacked. Therefore, our study aims to analyze the impact of these during-funding cues that initiated by fundraisers.

Multiple Management Responses in Crowdfunding

In crowdfunding platform, update often serves as a way to distribute information about the projects. It usually represents fundraisers' efforts to reach out to current and potential investors and inform developments of a project (Mollick 2014). Response refers to a fundraiser's effort to respond to customers' comments on experience with its products and services (Ye 2014), which is another important way for fundraisers to communicate with backers.

As ways to communicate with backers, updates and responses can be considered as two types of management responses (MRs) from fundraisers. Management response is continuous, dynamic and reciprocal process of communication initiated by managers to engage prospective customers (Chunyu Li 2017). As a form of public firm intervention, it becomes increasingly important nowadays (Chunyu Li 2018). Studies have shown that the provision of MR can enhance inferences about the business's trustworthiness and the extent of its cares about customers (Sparks et al. 2016). More importantly, not only those who receive management responses but also those who observe management responses will be affected (Ye 2014).

We argue that update is undirected MR that communicates to the entire audience base and response is directed MR that communicates to a targeted backer because their communication modes are different. Research suggests that the effects of directed and undirected communication modes in affecting people's behavior would be different (Goh et al. 2013). In crowdfunding market, undirected updates have a higher level of reach in message. Under this circumstances, fundraisers would have less incentive to send false signals because doing so will incur substantial costs in the future. However, as a direct communication to a specific receipt, response provides more chances for manipulation with little cost. These differences might make backers perceived undirected MR more credible than directed MR. Thus, we differentiate MRs into undirected updates and directed responses to get a better understanding of management responses.

A handful of studies have indicated that updates are effective instruments to encourage backers' investment (Block et al. 2016; Kuppuswamy and Bayus 2018; Xu et al. 2014) and suggest that projects with frequent updates can greatly increase the probability of success. A report from Indiegogo also confirmed this, saying by providing regular updates, fundraisers can raise 286% more funds than those who update infrequently. But most studies are largely grounded in empiricism, can't provide theoretical explanation on why such positive effect takes place (Li et al. 2018). Turn to responses, most studies about it focus on online review or social media, pointing it may improve performance of firms (Tsz-Wai Lui 2018; Woo Gon Kim 2015) or enhance customer engagement (Chunyu Li 2017; Ye 2018). But in crowdfunding market, a novel venture finance model emerged recently, most studies have ignored the effects of responses.

Based on the aforementioned discussion, we want to explore how these two kinds of management responses (updates and responses) will affect backers' investment.

Cue Diagnosticity Framework

In crowdfunding platform, fundraisers often provide two types of management responses, which can be regarded as different cues. Research on cue diagnosticity suggests that whether a cue can be used in assessing quality varies according to its diagnosticity (Slovic and Lichtenstein 1971). A cue is diagnostic means it can help discriminate between alternative categorizations (Skowronski et al. 1987). The more diagnostic a cue is, the more likely it will be used by customers in their assessment process (Gwebu et al. 2018). Apparently, the effects of updates and responses depend on whether they can help backers categorize projects.

As an undirected MR that is hard to manipulate, update has to evolve over time such that cannot be changed instantaneously, which make it stable and credible (Devavrat Purohit and Srivastava 2001). It is a high-scope cue with higher diagnosticity and will only be changed by putting in considerable investments in both time and money (Devavrat Purohit and Srivastava 2001). On the contrary, directed response is a low-scope cue that is relatively less diagnostic because it usually gears to a targeted backer and can be easily manipulated. Previous studies suggest that the influence of a high-scope cue on a low-scope cue can be either positive or negative when they exist simultaneously (Wang et al. 2016).

On the one hand, some think that by changing low-scope cues' diagnosticity, high-scope cues can transmit their implications to low-scope cues, making them more diagnostic (Akdeniz et al. 2013; Purohit and Srivastava 2001). For example, Purohit and Srivastava (2001) found a positive high-scope reputation cue can either direct or indirect affect participants' assessment of product quality and the indirect effect usually achieved by promoting low-scope cues' diagnosticity. As an extension of this, Akdeniz et al. (2013) examined how two and three-way interaction of low-scope cues and a high-scope

cue affect customers' perceptions, the result also demonstrated that a brand reputation cue would positively moderates the effects of low-scope cues (i.e., price and warranty). On the other hand, there are other studies suggested the high-scope cues will attenuate the influence of low-scope cues (Gwebu et al. 2018; Utz et al. 2012). For example, Utz et al. (2012) found that when various class of information cues exist simultaneously, their influences were not equal and the influence of less diagnostic cues such as reputation and assurance seals would become insignificant when presented with more diagnostic review cues. Similarly, a recent study examined the effects of firm reputation and response strategies after data breaches and found that with a positive high-scope reputation cue, the response strategies (low-scope cues) would matter less (Gwebu et al. 2018).

As the findings on the relative effect of high-scope cues and low-scope cues are mixed, we aims to investigate how these two types of management response cues from fundraisers (updates and responses) interplay with each other in affecting backers' behaviors in crowdfunding context.

Besides, recent studies have shown that at different stages of project-funding cycle (early, middle and late), backers' contribution reasons would be different (Kuppuswamy and Bayus 2018). As we aims to analyze backers' behavior, we also consider this effect, discussing whether the effects of different cues are different over the project-funding cycle.

Research Model and Hypothesis Development

Figure 1 depicts the research model of this study. We denote undirected update as a high-scope cue and directed response as a low-scope cue that represent features of different management responses. They will affect backers' investment decisions through diagnosticity and the effect may be different at different stages of the project. This study specifically examines the relative effectiveness of multiple management responses on backers' investment decisions.

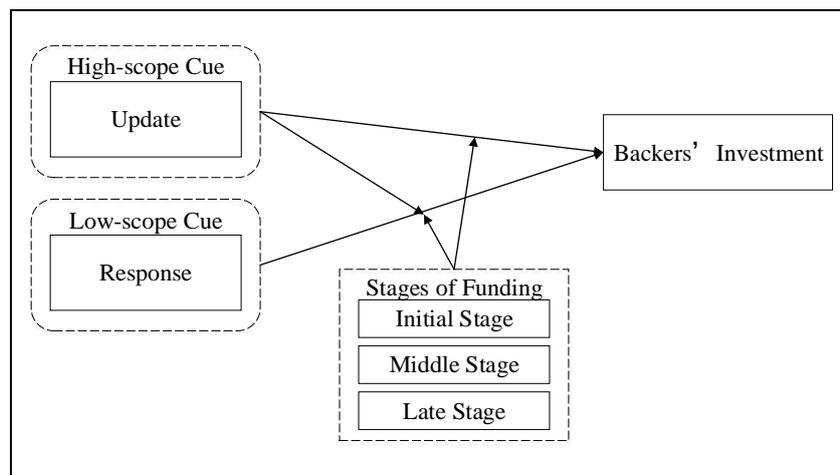


Figure 1. Research Model

Posting updates is important for managing a project for fundraisers. By continuously releasing updates, fundraisers can inform investors about recent fundraising progress, announce product modifications or just express their appreciation (Xu et al. 2014). Besides, as an undirected MR, update is less likely to be used to send false signals. As a result, projects with more updates are often considered highly credible, popular and can reduce funders' perception of risk (Li et al. 2018), which in turn stimulate potential funders' pledge. Previous studies also confirmed a positive association between the frequency of posting updates and crowdfunding success (Xu et al. 2014). Thus, we propose:

H1: As the number of updates increases, the number of backers will increase.

Designed and communicated to a specific backer, responses can meet backers' needs better (Goh et al. 2013), which also means fundraisers has devoted lots of time and resources. Thus, more responses can reflect fundraisers' greater willingness to care for backers (Chunyu Li 2017). As investing crowdfunding projects is a social activity for many funders to some extent (Ajay Agrawal 2014),

frequent responses can serve as cues that make perspective funders feel that they will be cared and could become part of the project if they invest. Thus, we propose:

H2: As the number of responses increases, the number of backers will increase.

As a cue that only released after the project has some progress, updates are regarded as more credible high-scope cues while responses targeted at a specific backer can be seen as low-scope cues that are relatively less diagnostic. According to cue diagnosticity theory, classifying something to a specific category's likelihood is higher when based on high-scope cues rather than low-scope cues (Purohit and Srivastava 2001). So, we can conclude that updates will have more influence on backers' decisions when associated with low-scope responses as it can achieve better classification. Thus, we propose:

H3: when exist simultaneously, updates will have more influence on backers' investment than responses.

As stated earlier, undirected updates are high-scope cues that evolve over time and can't be easily changed while directed responses are transient low-scope cues that can be easily manipulated. Research suggests that whether low-scope cues are diagnostic or not depends on the associated high-scope cues (Purohit and Srivastava 2001) and the influence can be positive or negative (Wang et al. 2016). On the one hand, when there are many updates in crowdfunding market, potential backers can get enough information to evaluate the quality of the project. As a result, they will have little motivation to use the response cues so that the effect of responses will be attenuated. On the other hand, many updates usually means fundraisers are more credible and responsible (Li et al. 2018), thus are less likely to send false signals by responses to mislead backers. Under this circumstance, credible updates will make the associated responses cues more diagnostic. Summing both perspectives, we propose the following competing hypotheses:

H4a (competing): Updates will attenuate the effect of responses on backers' investment decisions.

H4b (competing): Updates will amplify the effect of responses on backers' investment decisions.

Behaviors of backers who invest at different stages of a project are significantly different. In the initial and late stages of a project, the majority of contributions came from fundraisers' families or friends (Kuppuswamy and Bayus 2018). As a result, backers that pledged during these periods tend to ignore any cues, including the management response cues (updates and responses) because they were familiar with fundraisers. However, when projects advance to their mid-stages, a bulk of strangers who don't need to face time pressure flow to the project and decide whether to invest. Without nudge factors mentioned above, most perspective backers in this period are more likely to stay inactive (Li et al. 2018). Releasing updates and responses would be a good choice for fundraisers as these cues can stimulate visitors' incentive to invest (Li et al. 2018). Thus, we propose:

H5a: Updates at the middle stage of the project can have greater impact on backers' investment than initial and late stages.

H5b: Responses at the middle stage of the project can have greater impact on backers' investment than initial and late stages.

Methodology

To validate the hypothesized relationships, we collected project-day panel data from Indiegogo.com. As one of the largest international reward-based crowdfunding platforms, it provides a channel for fundraisers to raise money. The platform enables fundraisers to offer updates and responses simultaneously during the project, which permits us to explore effect of different management responses cues in crowdfunding context.

We have gathered data on a daily basis since October 2018 and have obtained data for thousands of projects. In order to examine backer behaviors during the initial, middle and late stages of the funding cycle, we restrict our data to projects whose duration are at least 21 days to make sure an adequate length of time. After cleaning the data of projects, we sampled 712 unique projects with 24,426 observations of which the funding cycle are fully covered by our data collection period to conduct a preliminary analysis.

Variables

Table 1 shows the measurements of the focal variables included in the research model.

Table1. Measurements of Focal Variables

Variables	Measurements
Backers' investment	the number of backers project i receives in day t
Updates	the number of updates for project i in day t
Responses	the number of responses initiated by fundraisers for project i in day t
Initial Stage	dummy variable that capture the first seven days of project i
Middle Stage	dummy variable that capture days except for the first and last seven days
Late Stage	dummy variable that capture the last seven days of project i
Popular	dummy variable that shows if a project is on the top 10% of all projects
PostFunded	dummy variable that shows whether a project has already been funded
Cumu_Amount	the amount of cumulative capital raised before day t

Besides, we include variable Day-of-Week to control for the possibility that investments concentrate on certain days of a week and Month-Year to control for any other unobserved time-varying effects. It should be noted that Middle Stage dummy is not included in model because it is the base group.

Preliminary results

As the dependent variable Backers' Investment is a non-negative integer, we estimate a panel count model (using a Poisson Quasi-Maximum Likelihood estimator). And we estimate fixed-effects models to account for unobserved project heterogeneity. After doing Hausman test, we found that fixed-effects models are preferred. Finally, we adopted the conditional fixed-effects Poisson model because it corrects for overdispersion and allows for cluster-robust standard errors (Cameron and Trivedi 2010). The preliminary results of estimating with existing data is in Table2.

Table2. Preliminary Results of Conditional Fixed-effects Poisson model

Variables	Model1	Model2	Model3	Model4	Model5
Updates	0.394***	0.233***	0.223***	0.258***	0.168***
Responses	0.0199***	0.0206***	0.0206***	0.0170***	0.0328***
Updates*Responses	-0.0127***	-0.00684***	-0.00419**	-0.00440*	-0.00480**
Popular		2.089***	2.061***	1.946***	1.923***
PostFunded		-0.204*	-0.131	-0.061	-1.97E-05
Ln(Cumu_Amount)		-0.0739***	-0.0397*	0.00118	0.00475
Day-of-Week			-0.0276**	-0.0296**	-0.0315**
Month-Year			-0.444***	-0.246***	-0.285***
Initial Stage				0.551***	0.600***
Late Stage				0.121*	0.173***
Updates*Initial Stage					0.266*
Updates*Late Stage					0.0125
Responses*Initial Stage					-0.0181***
Responses*Late Stage					-0.0124***

We find the coefficient on the interaction of updates and responses is negative and significant, which supports the argument that high-scope cues will attenuate the influence of low-scope cues.

Expected Contributions and Future Research Plans

By collecting data from Indiegogo.com, this paper analyze the effects of management response on backers' investments based on cue diagnosticity framework. The following contributions are expected. First, extending prior management response literatures that only focus on responses, this paper identifies a taxonomy of management responses so that efficacy of management responses can be systematically investigated. Second, to our knowledge, there is scarce empirical research that builds upon the cue diagnosticity framework to conceptualize the cues in crowdfunding. Based on this framework, this paper advance prior studies by analyzing the interaction effect of updates and responses. That provides a foray into better understanding of backers' investments in the context where multiple management response cues exist simultaneously. Third, our research is among the first to reveal the impact of updates and responses at different stages of the project, which can provide guidance for fundraisers more accurately.

For the future research plan, we will collect more data from Indiegogo to further explore the relationships between these variables and conduct a series of robustness analysis for the existing model.

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