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Research-in-Progress

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Abstract

Crowdfunding has emerged as a vital financing avenue for entrepreneurs to realize their ventures. With limited information availability, crowd-funders may choose to first follow the progress of interested crowdfunding campaigns, such as monitoring project updates to acquire more information for justifying investment decision, before making pledges. Although campaign updates have been touted to be a salient driver of fundraising success, the underlying mechanism for this relationship remains unclear. Subscribing to nudge theory, we strive to shed light on how update strategies, such as frequency and message length, can serve as nudges to convert project followers to actual funders. Specifically, we posit a dual-role of campaign updates whereby an over-zealous update strategy may induce a counter-nudging effect that deters prospective funders, what we labelled as 'over-nudging'. This study advances a model to account for both the nudging and counter-nudging effects of campaign updates in crowdfunding, which could yield insights for fundraisers to optimize their update strategy and in turn, get their business off the ground.

Keywords: Crowdfunding, nudge theory, campaign update, over-nudging

Introduction

Recent years have borne witness to the increasing popularity of crowdfunding platforms as a source of financing for entrepreneurs or individuals who seek capital investments in their initiatives (Belleflamme et al. 2013). Crowdfunding entails the collective effort of a large group of micro-investors who pool

small individual amounts of capital, typically via digital platforms, to finance a project or venture (Zheng et al. 2014). The crowdfunding market is estimated to have amassed over USD \$34 billion in capital in 2015 alone (Massolution 2015) and for the first time in 2016, crowdfunded equity have surpassed funding from venture capital (Scott-Briggs 2016).

Despite the enthusiasm surrounding crowdfunding, market reports have alluded to huge discrepancies in project performance: many crowdfunding projects fail and fell by the sideways even though massively successful projects exist at the same time (Crowdrating 2016). Due to reasons like information asymmetry or lack of confidence, many crowd-funders stay predominantly inactive or choose to first follow the fundraising progress of the campaign they are interested in before making pledges (Kuppuswamy and Bayus 2015). Consequently, fundraisers are advised to communicate with their project followers via posting updates to keep them apprise of the campaign's progress (Block et al. 2016; Xu et al. 2014).

While there is general consensus among scholars that regular updates constitute a key driver of campaign success, we have somewhat limited knowledge of the mechanisms through which campaign updates galvanize prospective funders' contribution. Given that updates serve as one of the main channels for fundraisers to communicate with their followers, this study advances campaign followers' conversion rate as the focal indicator that connects campaign updates to fundraising success. Specifically, we attempt to unravel how crowdfunding campaigners can formulate optimized update strategy to steer followers to convert from passive followers into believers of their campaigns. Subscribing to nudge theory (Johnson et al. 2012; Miesler et al. 2017; Thaler and Sunstein 2008), we conceive fundraisers' update strategy as a form of nudge that could alter the appeal of contributing in the eyes of followers, thereby shaping the latter's investment decisions.

Originating from the work of Thaler and Sunstein (2008), nudge theory has been shown to be effective in modifying human behaviors across diverse contexts in the likes of community cohesion (Momsen and Stoerk 2014), energy conservation (Momsen and Stoerk 2014), lifestyle choices (Vallgård 2012), and purchasing behaviors (Bull 2012). Conceivably, the act of nudging is a powerful intervention tool that applies choice architecture to achieve desired psychological outcomes and transform human behaviors (Mirsch et al. 2017). But at the same time, there are detractors who have casted doubt on the effectiveness of nudging. According to Sunstein (2017), nudging can be futile since it often produces short-term effects. Nudging effect might also evoke resistance or even counter-nudges, such as taking actions that run contrary to nudgers' expectation (Saghai 2013; Sunstein 2017). Conceivably, the nudging effect of campaign updates, albeit being documented to be beneficial for campaign success, may culminate in conflicting outcomes if improperly applied.

To this end, this study embraces nudge theory to uncover the optimal strategy for fundraisers to leverage updates in encouraging their followers to pledge. Particularly, we endeavor to: (1) *advance campaign updates as a form of nudge that steers followers' conversion behavior by altering the perceived appeal of investment, and;* (2) *explore how fundraisers can optimize their updating strategy to maximize the effects of nudging.* Addressing these two research questions would yield novel insights for fundraisers to further their business ventures.

Theoretical Foundation

Nudge Theory

According to Thaler and Sunstein (2008, p. 90), a nudge is “any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives”. A policy maker who employs a nudging approach can be regarded as a choice architect since nudge theory describes how people's perception and behavior are altered through the framing and presentation of the choice architecture (Burns and Roszkowska 2016). Unlike persuasion paradigms that appeal to the economic rationality of humans, nudging approaches are tuned towards people's intuitive responses to the design of a choice context, which in turn guides their decision in an anticipated way (Kosters and Van der Heijden 2015; Miesler et al. 2017).

Nudge theory is founded on the premise that decision makers make choices in an environment where both overt and covert influences can affect their decisions (Kosters and Van der Heijden 2015). Therefore, a governing principle of nudging lies in the design of choice architecture, typically through simple toolkits, whereby nudgers' desired option can be rendered much more appealing (Johnson et al. 2012). Thaler et al. (2014) advocated six principles of good choice architectures, namely setting defaults, error forgiving, giving feedback, relating expected choice to welfare, structuring complex choices, and providing incentives. For example, presenting a default option has been touted as an effective approach for influencing important decisions, including insurance (Johnson et al. 1993), investment (Madrian and Shea 2001), medical treatment (Kressel and Chapman 2007), and organ donation (Johnson and Goldstein 2003). Johnson et al. (2012) added to the basket of nudging toolkits by delineating tools into: (1) those structuring the choice task, such as introducing decision aids (Lynch Jr and Ariely 2000), and (2) those describing the choice option, such as enhancing accessibility of the benefit of the expected choice (Miesler et al. 2017). Besides, it is noticeable that nudges are not necessarily informational, the delivery of information could merely serve as a heuristic that stimulates people's subconscious favorable attitudes due to the evocation of awareness (Mirsch et al. 2017; Ölander and Thøgersen 2014).

As a tool of behavioral intervention, the efficacy of nudging has been equivocal within extant literature. Sunstein (2017) put forth two circumstances whereby nudges can be less effective than expected. Nudging effect triggers cognitive resistance (Saghai 2013; Sunstein 2016) such that if nudges harbor strong preference towards certain behavior, they are less willing to alter their choice without intense economic incentives or penalties. For example, long-time smokers are unlikely to quit smoking despite health warnings on cigarette packaging since these warning messages cannot overcome their desire for cigarettes (Saghai 2013). Nudges may also induce reactive effect (McCoy et al. 2017) labeled as 'counter-nudges' (Sunstein 2017), that persuade people to behave in ways, which confound the efforts of choice architects. This implies that nudges, when overexploited or utilized improperly, can be annoying due to its cognitive demand, which in turn arouses feelings of fatigue and anxiety and/or induce perceptions of authority (Saghai 2013).

Campaign Updates in Crowdfunding

Crowdfunding has been a focal innovation in financial markets in the past decade. By digitalizing capital markets, crowdfunding circumvents geographical constraints of financing activities and allows capital seekers to pool funds from micro-investors worldwide (Agrawal et al. 2015). Unlike professional investors, crowd-funders usually have limited experience in evaluating business ventures, and are therefore more likely to rely on heuristics to inform their investment decisions (Belleflamme et al. 2013). Specifically, information cues, such as fundraising goal and duration, as well as social networks, were found to be crucial drivers of fundraising success (Zheng et al. 2014). For example, Ahlers et al. (2015) alleged that fundraising goal and duration could be seen as indicators of fundraisers' self-confidence and that more ambitious campaigns tend to be more successful. Nevertheless, making pledging decisions in a crowdfunding environment is deemed to be challenging due to information asymmetry (Beaulieu et al. 2015; Mollick 2014). The bystander effect was raised by scholars in the crowdfunding context to depict the phenomenon of potential funders who, despite hesitating with their investment pledges, decide to first follow the fundraising progress of the campaigns that have piqued their interests (Kuppuswamy and Bayus 2015). According to Kuppuswamy and Bayus (2015), without extra stimuli or incentives, such as the propagation of popularity signals or the application of time pressure, these bystanders might remain passive or even forgo contributing to the campaign altogether (Lukkarinen et al. 2016).

A handful of studies have hailed campaign updates as an effective instrument for stimulating potential funders' investments, primarily due to its capacity to raise awareness and induce perceptions of popularity and trustworthiness (Block et al. 2016; Xu et al. 2014). For instance, Xu et al. (2014) classified update messages according to their content and found that all kinds of updates, informational or non-informational, are positively associated with campaign success. In the same vein, Indiegogo reported that fundraisers who provide regular updates tend to raise 286% more funds than those who

remain dormant¹. Despite empirical evidence attesting to the advantages of posting updates, there is a paucity of theoretical development in terms of unravelling the mechanism of how specific campaign updates could convert potential funders' passivity to actual funding behavior. Past studies exploring the association between campaign updates and fundraising performance are largely grounded in empiricism, offering little theoretical explanation on why and how such an effect takes place. Also, in these studies, they failed to control for the possibility that such campaigns making updates might already be inherently more ambitious, responsible, and of a higher quality than those without updates. Due to a lack of clarity on the role or significance of updates in prior research, we hence argue for the importance of scrutinizing the conversion rates from campaign followers to actual funders. This allows us to isolate the role of updates in driving the performance of crowdfunding campaigns.

The ability of campaign updates to steer potential funders' pledge behavior, regardless of the content in these messages (Xu et al. 2014), also implies that the mere presence of updates could serve as a heuristic for campaign credibility (Kraus et al. 2016; Mollick and Nanda 2015) and in turn, converts followers into actual funders. Moreover, posting updates is an effective tool for fundraisers to interact with funders, thereby creating a sense of community (Beaulieu et al. 2015). Such online social communities have been widely acknowledged as an incentive for funders to back a given campaign (Gerber et al. 2012; Zheng et al. 2014). Given that the level of campaign performance is highly dependent on the conversion rate of followers into actual funders, this study seeks to account for the effectiveness of distinct campaign updating strategies in driving such conversions.

Espousing nudge theory, we conceive update strategy as a nudge designed to alter bystanders' inaction through reforming the appeal of a given campaign. We also delve into the ineffectiveness of nudges by positing that the nudging effect of campaign updates may be compromised or even perverted under certain circumstances. We put forth two hypotheses that highlight both the pros and cons of campaign updates by connecting the updating strategy to campaign follower's conversion behavior.

Hypotheses Formulation

Fundraisers are recommended to continuously post updates to inform funders about fundraising progress, report recent product modifications, elaborate on their business, or simply express appreciation (Xu et al. 2014) in order to bolster the appeal and trustworthiness of their campaigns.

Notably, Xu et al. (2014) indicated that the bulk of update messages does not carry significant economic incentives and that even a simple 'thank-you' message can increase the likelihood of campaign success. Subscribing to the nudge theory (Thaler and Sunstein 2008), we anticipate that regardless of the informational content, the enactment of an update strategy itself could serve as a tool of nudging that stimulates the conversion of campaign followers. Particularly, we propose two heuristics conveyed by the updating strategy, *update frequency* and *message length*, as the main ingredients of a nudge that alters followers' evaluation of the appeal of a given campaign.

Update Frequency: Ölander and Thøgersen (2014) considered the delivery pattern of information as a crucial factor of nudge design. This proposition is consistent with past studies that documented a positive association between the frequency of posting updates and crowdfunding success (Kraus et al. 2016; Xu et al. 2014). The rationale behind this effect may be attributed to the fact that: (1) campaigns with regular updates attract potential funders' pledges by creating harmonious and flourishing communities, as well as; (2) fundraiser's diligence in posting updates may be interpreted as a signal of credibility and campaign popularity, which in turn reduces funders' perception of uncertainty in the investment.

Nevertheless, past studies have hinted at the potential presence of 'counter-nudging' effects that could erode the effectiveness of nudges (Saghai 2013; Sunstein 2017). Particularly, factors like cognitive load, distraction, fatigue, and skepticism may trigger people's resistance to nudges (Saghai 2013). In this sense, the confounding impact of nudging effect has been widely reported. For example, tangential evidence suggests that with increased exposure frequency and stimulus complexity, persuasive message

¹ <https://support.indiegogo.com/hc/en-us/articles/205183587-Post-Updates-To-Raise-Awareness-Funds>

may become annoying due to the arousal of feelings of tedium (Cacioppo and Petty 1979; Jeong et al. 2011). Likewise, marketing research indicates that while push advertising may boost subscribers' awareness, such attention-grabbing stimuli may become futile or even detrimental when advertisements are excessively delivered (Saghai 2013).

In line with the preceding evidence, it is conceivable that the frequency of updates can play a dual role in affecting campaign follower's conversion behavior. Specifically, increasing the frequency of posting updates can be viewed as heuristics of credibility and popularity while overly-frequent updates could evoke followers' emotions of tedium. Therefore, campaign followers are more likely to become actual funders when the update frequency increases to a certain point. Such two-factor impact could produce an inverted U-shaped relationship between update frequency and follower conversion. We therefore hypothesize that:

H1. *There exists an inverted U-shaped relationship between the update frequency of a given campaign and the conversion of its followers.*

Message Length: Prior research has also uncovered that message length acts as a peripheral cue of credibility in the sense that a longer message is likely to be deemed as being more convincing (Otondo et al. 2008). Fundraisers, who revealed more information in update messages, might be inferred as being more trustworthy and in turn, nudge followers into investing. Indeed, the message length of updates has been shown to increase the probability of fundraising success (Xu et al. 2014).

Nonetheless, the over-nudging effect could also transpire with increasing message length. According to Sunstein (2017), people may be deterred by overly complex or confusing information, therefore the design of disclosure strategy is crucial when forming nudges. Overly wordy message can induce communication fatigue (Lee et al. 2016), prompting its targeted audience to ignore the delivered information or even form negative attitudes about them (Robinson et al. 2007). Likewise, extant literature on marketing discerned that while the length of digital advertisements may serve as a heuristic of informativeness, it is also likely to produce negative emotions such as tedium, thereby discouraging consumers from clicking on the projected advertisements (Baltas 2003). Therefore, the nudging effect of updates can be optimized when delivered texts are neither too short nor too long. Specifically, simplistic messages may be inferred as lacking in seriousness and reduce the credibility of fundraisers, whereas lengthy message may become ineffective or even jeopardize the nudging effect due to fatigue in reading. In both cases, campaign followers are unlikely to be convinced. We therefore hypothesize that:

H2. *There exists an inverted U-shaped relationship between the message length of campaign updates and the conversion of its followers'.*

Methodology

To validate the hypothesized relationships, we collected data of 88,542 campaigns from a leading global reward-based crowdfunding platform. The platform enables potential funders to follow campaigns in which they are interested. Campaign followers can receive notifications, mainly through email or the website in-box, when the fundraiser posts updates on the campaign homepage. This function permits us to explore the nudging impact of updates on campaign followers' conversion behavior, since these followers are prime targets for receiving released updates.

Focal variables for testing our hypotheses are: (1) *Conversion_rate*, which is a natural measure of followers' conversion at a collective level and is calculated by the proportion of campaign followers that are converted to funders; (2) *Update_freq*, which represents the update frequency of a given campaign, and; (3) *Update_len*, which captures the average number of words in all update messages of a given campaign. Subscribing to prior research that has yielded a variety of drivers of crowdfunding success (Ahlers et al. 2015; Cordova et al. 2015), we controlled for several variables such as fundraisers' experience in crowdfunding activity, campaign descriptions, as well as fundraising goal and goal type. A list of focal variables along with their definitions is summarized in Table 1 below.

| Variable | Definition |
|----------|------------|
|----------|------------|

| | |
|--------------------|--|
| Conversion rate | Proportion of campaign followers who eventually pledge to the given campaign |
| Update_freq | Update frequency, measured by the average number of updates being posted per day |
| Update_len | Update length, measured by the average number words in update posts |
| # FR_campaigns | Number of campaigns (except for the focal one) launched by the fundraiser |
| # FR_contributions | Number of times the fundraiser contributes to other campaigns |
| Goal | Campaign's fundraising target |
| Flexible_goal | Binary indicator of whether the fundraising target is flexible |
| Campaign_text | Number of words in the campaign description |
| Campaign_visual | Number of videos and images offered in the campaign description |

Table 1. Definitions of Focal Variables

The regression model for testing the proposed hypotheses is as follows:

$$\text{Conversion_rate} = \beta_0 + \beta_1 * \text{Update_freq} + \beta_2 * \text{Update_freq}^2 + \beta_3 * \text{Update_len} + \beta_4 * \text{Update_len}^2 + \beta_i * X_i$$

where $\beta_i * X_i$ captures the effects of control variables. After filtering out the samples with missing data, we end up with 73,560 observations to test our regression model. To avoid multicollinearity issue that commonly incurs when testing curvilinear relationship, we mean-centered *Update_freq* and *Update_len* (Dawson 2014; Gefen and Pavlou 2012). Moreover, we apply the logarithmic transformation for variables that are non-Gaussian (Benoit 2011). A summary of the descriptive statistics of our focal variables can be found in Table 2 below.

| Variable | Min | Max | Mean | Std. Dev. |
|--------------------|------|------------------|------------|---------------|
| Conversion rate | 0.00 | 1.00 | 0.73 | 0.33 |
| Update_freq | 0.00 | 7.47 | 0.11 | 1.56 |
| Update_len | 0.00 | 4,160.00 | 244.19 | 383.97 |
| # FR_campaigns | 0.00 | 9.00 | 0.41 | 0.73 |
| # FR_contributions | 0.00 | 15.00 | 0.47 | 1.20 |
| Goal | 1.00 | 2,000,000,000.00 | 636,101.38 | 29,388,932.82 |
| Flexible_goal | 0.00 | 1.00 | 0.16 | 0.36 |
| Campaign_text | 0.00 | 63809.00 | 4119.66 | 3658.34 |
| Campaign_visual | 0.00 | 176.00 | 3.58 | 7.93 |

Table 2. Descriptive Statistics

Expected Contribution to Theory and Practice

This study aims to contribute to crowdfunding and nudging research on two fronts. First, complementing previous work that alludes to a positive relationship between campaign updates and crowdfunding success (Block et al. 2016; Xu et al. 2014), our study advances potential funders' conversion behavior as the vital mechanism in this linkage. Subscribing to nudge theory, we postulate the nudging effect of updates to be a salient factor that could shape campaign followers' pledging decisions and in turn, sway the financing outcome. Specifically, we contend that the action of delivering information in itself, regardless of content, can serve as nudges that govern bystanders' conversion behavior (Ölander and Thøgersen 2014). Second, considering the threat posed by counter-nudges (Saghai 2013; Sunstein 2017), we hypothesize a dual-influence of campaign updates. We contest that an extensive updating strategy is likely to induce an 'over-nudging' impact such that potential funders

may eventually choose to opt out due to feeling of fatigue. Accounting for both nudging and counter-nudging effects of campaign updates in crowdfunding, this study serves as a first step toward designing an optimized update strategy for fundraisers to maximize the appeal of their business venture.

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