Shock and awe: Loudness and unpredictability in Twitter messages and crowdfunding campaign success

Marcus T. Wolfe[1,*,a], Pankaj C. Patel[1,b], Andrew S. Manikas[c]

[a] *Price College of Business, University of Oklahoma, 307W. Brooks - Rm. 206, Norman, OK 73019-0450, USA*
[b] *Villanova School of Business, Villanova University, 800 E. Lancaster Avenue, Villanova, PA 19085, USA*
[c] *College of Business, Department of Information Systems, Analytics & Operations, University of Louisville, Louisville, KY 40292, USA*

A B S T R A C T

Although recent evidence has found support for the importance of social media in communicating specific messages between venture founders and their target audience, there remains a relative paucity of research regarding how specific temporal elements of social media activity are related to key venture development outcomes. In this context, the current study draws on the conceptual framework of shock advertising to understand how *louder* (i.e., an increasing number of tweets) and *unpredictable* (i.e., tweets at non-standard times) Twitter activity can improve the odds of crowdfunding success. Using a sample of Kickstarter projects between 2009 and 2018 and cross-sectional regressions (ordinary least squares and the logit model), we find that the odds of meeting goals increase 1.24 times with each percentage increase in tweets, relative to tweets in the project-category-year. The odds of success increase further with an increase in the unpredictability and number of project-category-year adjusted tweets. In an era when standing out in the social media is increasingly challenging, our findings have implications for managing social media messages during crowdfunding campaigns.

Published by Elsevier España, S.L.U. on behalf of Journal of Innovation & Knowledge. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/)

Introduction

Crowdfunding has gained attention as a means used by entrepreneurs to secure financial resources. The crowdfunding process involves soliciting a large number of interested backers to invest small sums of funds for a project in exchange of a non-financial reward (Davis, Hmieleski, Webb & Coombs, 2017; Mollick, 2014). Owing to its rapidly rising popularity, there has been an increasing research focus on the factors influencing the outcomes of the crowdfunding process (Fischer & Reuber, 2014). In addition to the structural elements of a crowdfunding project, the recent research has provided further understanding of the subjective basis of crowdfunding performance. Specifically, it has indicated that crowdfunding success can be influenced by the content of crowdfunding campaigns, such as the use of narcissistic language (A. H. Anglin, Wolfe, Short, McKenny & Pidduck, 2018) or the emphasis of concern in crowdfunding appeals (Allison, McKenny & Short, 2013). Although recent efforts at examining the crowdfunding process have focused on how specific narrative elements contained within the campaigns might influence funding

performance (A. H. Anglin et al., 2018; Parhankangas & Renko, 2017), there are other external factors that, when used in tandem with crowdfunding campaigns, can increase campaign success.

In this context, it must be noted that the social media has become an important mode of communication and influence for crowdfunding campaigns (Aragón, Kappler, Kaltenbrunner, Laniado & Volkovich, 2013; LaMarre & Suzuki-Lambrecht, 2013). Studies show that early promotion of crowdfunding products or services on social media positively influence the crowdfunding performance (Lu, Xie, Kong & Yu, 2014). Since one of the most important campaign outcomes of crowdfunding is the number of backers, it stands to reason that campaign founders with a larger number of social media followers have a higher likelihood of achieving campaign success (Moisseyev, 2013). Given that social media activity is one of the ways through which founders can garner the attention of a large number of potential backers, which is key to campaign success, campaign founders who are more active on social media platforms are more likely to experience better performance (Nevin et al., 2017). However, social media is becoming an increasingly *noisy* communication channel, driving individuals to *shout above the noise* to be heard by their intended audience (El Abaddi et al., 2011; Lewis, 2013). In this regard, while evidence indicates that specific aspects of the message content contained within crowdfunding campaigns can serve to moderate the relationship formed between founders and potential investors,

* Corresponding author.
  E-mail addresses: mtwolfe@ou.edu (M.T. Wolfe), pankaj.patel@villanova.edu (P.C. Patel), andrew.manikas@louisville.edu (A.S. Manikas).
  [1] These authors contributed equally to this manuscript

thereby increasing campaign performance (Borst, Moser & Ferguson, 2018), less is known about how these persuasive efforts may be influenced by the temporal aspect of social media posts.

Although recent studies have focused on the importance of project details at the start of campaigns, the funding outcome, and the nature of social media activity, there is limited understanding of how project owners can *manage* the social media messages *during* the campaign. Given that strategic temporality is an important tool for enhancing persuasive efforts (Zhang et al., 2017), we draw upon the fields of marketing and politics to understand the temporality of social media posts in relation to the crowdfunding campaigns. It must be noted that real-time marketing via social media is considered an effective strategy when messages are linked with unpredictable, as opposed to predictable, timing and events (Willemsen, Mazerant, Kamphuis & van der Veen, 2018). The considerable media coverage that the former US President Donald Trump received as a result of his unpredictable tweets serves as a salient example of the potential value of such *unpredictability* in social media activity (Wells et al., 2020). This unique combination of employing a high volume of social media activity (i.e. loudness) and relative unpredictable social media posts (i.e., social media posts outside of the normal news cycle hours) can increase the likelihood of making the social media messages rise above the noise, thereby increasing their persuasiveness.

To test the proposed framework, we use (i) a third-party web scraping service (*WebDataGuru*) to collect data on Kickstarter projects launched between May 31, 2009 and December 12, 2018 and (ii) *Web Robots* to supplement the data in (i) with additional information. We also use three outcomes—meeting the funding goal, total funded amount, and the number of backers—as dependent variables. Owing to variations in self-selection into Twitter activity and the lack of instruments explaining this self-selection but not explaining the funding outcome, we exclude projects without Twitter activity. This filtration yielded 7946 projects from 2009 to 2018. Using the ordinary least squares (OLS) and logit regressions on the cross-sectional data, we find support for our hypotheses.

Unlike research focusing on how social media activity (Fischer & Reuber, 2014) or the content of social media posts (Fischer & Reuber, 2011) influence the key aspects of the entrepreneurial process, we examine how the temporal characteristics of social media activity (i. e., loudness and unpredictability) can influence crowdfunding performance. We posit that tweeting itself may not be a sufficient antecedent to improved campaign performance. However, social media loudness—increasing the number of tweets, relative to tweets during the project category-year average—may play a more crucial role in increasing the relative persuasiveness of the message. Specifically, in order to increase the fidelity of the tweets, it is crucial to increase the number of crowdfunding project tweets, relative to the comparison set (i.e., other projects in the category during a given period). While it may be important to increase the number of crowdfunding project tweets, relative to similar other tweets, consistent increases in tweets may desensitize potential investors, thereby suppressing the effectiveness of the additional social media activity. Conversely, unpredictability in increasing tweets, relative to similar other tweets, may increase the project visibility in the social media space. Essentially, developing a temporal strategy for managing social media messages can be crucial to managing attention and maintaining interest in the campaign. In order to maximize the benefits from social media marketing efforts, entrepreneurs should carefully consider their social media messages, engagement level, and the actual timing of tweets.

In this context, this study draws upon the concepts of shock advertising, which can be defined as an attempt to *shock* prospective audiences by explicitly and intentionally violating cultural norms for societal values and personal beliefs (Dahl, Frankenberger & Manchanda, 2003). In advertising, while shocking or unexpected content is included to draw audiences' attention toward the product/service

being marketed (Parry, Jones, Stern & Robinson, 2013), evidence suggests that such content can provide other ancillary benefits. For instance, recent research indicates that viral ads with certain forms of shocking content can increase the audience involvement, product and brand information retention, the likelihood of members sharing product information, and overall advertisement likeability (Brown, Bhadury & Pope, 2010). Building on this notion, we argue that an unpredictable social media activity can serve a similar function in terms of its influence on the relationship between social media and crowdfunding performance. Specifically, our findings suggest that the positive relationship between the performance of a crowdfunding project and its founders' social media activity is enhanced when the founders act louder and more unpredictable than the other participants in their project-category. It is possible that by being louder and more unpredictable in regard to the timing of their social media activity, entrepreneurs can effectively find a way to rise above the noise normally associated with social media. This can contribute toward increased audience involvement, and thereby improve crowdfunding performance.

Our findings make the following valuable contributions. First, we extend existing research on the relationship between social media activity and crowdfunding. By demonstrating that increased Twitter activity is positively associated with multiple important crowdfunding outcomes (i.e., funds raised, number of backers, fundraising goal met, etc.), we support recent findings that founders who are more active on social media platforms have a better chance of conducting successful crowdfunding campaigns (Hong, Hu & Burtch, 2015; Nevin et al., 2017). Second, by applying the concepts of *shock advertising* to crowdfunding, we extend our understanding of how specific forms of social media usage might further moderate the relationship between general social media activity and crowdfunding performance. By paralleling the similarities between unpredictable social media activity and shock advertising, we present some plausible rationale behind the role of unpredictable social media activity in enhancing the relationship between social media activity and crowdfunding performance. Finally, we complement the growing interest in how specific narrative elements contained within crowdfunding campaigns can influence its performance. We also reinforce the need to consider factors external to the campaigns when analyzing the relative appeal and success of a given crowdfunding campaign.

In the next section, we present a literature review and hypotheses. Subsequently, we describe the data, measurements, and results. Finally, we discuss the theoretical and practical implications of our findings, followed by the limitations and potential areas of future research. We conclude with the main inferences of our study.

Literature review

The growing popularity of crowdfunding as a means of securing the financial resources necessary to start a new venture has attracted scholarly attention, with studies mainly focusing on the factors influencing the outcomes of the crowdfunding process (Short, Ketchen, McKenny, Allison & Ireland, 2017). In this context, studies have emphasized how specific narrative elements contained within the campaigns can more effectively persuade potential investors to contribute to a given campaign (A. H. Anglin et al., 2018; Anglin, Allison, McKenny & Busenitz, 2014). While this stream of research has given several valuable insights into the crowdfunding process, there is a need to conduct further research to better understand all the factors influencing the crowdfunding process.

Social media loudness and crowdfunding performance

The social media activity of campaign founders plays a crucial role in crowdfunding. Recent evidence indicates that social media activity such as increased Twitter posts can positively influence

crowdfunding success (Kaur & Gera, 2017; Nevin et al., 2017). For example, the number of social media followers is positively related to overall crowdfunding performance (Borst et al., 2018). Particularly, social media activity can be particularly beneficial for the early promotion of successful crowdfunding campaigns (Lu et al., 2014). Recent findings also indicate that social media can motivate potential investor activity (Blankespoor, 2018; Elliott, Grant & Hodge, 2018). In fact, the strategic use of social media can play a critical role in influencing investor decisions (Piñeiro–Chousa, López-Cabarcos, Pérez-Pico & Vizcaíno-González, 2020) and crowdfunding performance (Datta, Sahaym & Brooks, 2019).

Although the literature has established the general relationship between social media activity (i.e., tweets) and crowdfunding performance, studies have paid little attention to how *changes* in social media activity during a crowdfunding campaign can differentially influence crowdfunding performance. This is a salient topic of interest, given that social media activity is one of the primary forms of communication, marketing, and advertising that individuals can employ in a controlled and affordable manner (Marwick & Boyd, 2011) to seize financial opportunities (Pegoraro & Jinnah, 2012). While the generally espoused recommendation is to increase the number of tweets, given the ever-increasing noise present within the social media platforms (Lewis, 2013), we argue that the key to crowdfunding success is a more nuanced and strategic approach toward the temporal aspect of when to employ social media. In this regard, social media loudness—or the extent to which individuals tweet relative to similar *others*—and unpredictability—the relative consistency and regularity of social media activity—can be important considerations in managing the crowdfunding campaign messages.

There is a lack of research on how increased Twitter usage (i.e., "tweeting") can influence crowdfunding performance. However, if we view social media activity as a form of marketing and advertising (Dwivedi, Kapoor & Chen, 2015; Knoll, 2016), then we can draw on the considerable body of research on the effectiveness of advertising frequency to better understand the potential relationship between increased tweeting and crowdfunding performance. The field of advertising has long espoused the notion that the persuasiveness of a communication is positively influenced by exposure frequency (Cacioppo & Petty, 1980), and advertising frequency has been shown to benefit advertisement recall and effectiveness (Schmidt & Eisend, 2015). Evidence has also indicated that advertising frequency can be particularly useful in increasing the effectiveness of online advertising efforts (Broussard, 2000). Given that crowdfunding founders' tweets function as advertisements used to build individual brands (Marwick & Boyd, 2011), it stands to reason that if campaign founders increase the frequency of their tweeting throughout the campaign, they can improve their campaign performance. Hence, we offer the following hypothesis:

Hypothesis 1: An increase in Twitter activity (i.e., *social media loudness), adjusted for project category and year, is positively related to the likelihood that crowdfunding campaigns will (a) meet funding goals, (b) increase the amount of funds raised, and (c) increase the number of backers.*

Moderating influence of unpredictability

While an increase in the overall social media activity, relative to similar other activities, can play an important role in crowdfunding performance, it would be important to consider other aspects in regard to how social media activity can influence key crowdfunding outcomes. Specifically, an increase in the unpredictability and loudness of founders' social media activity can further attract audience's attention and interest. In this context, drawing on the research on advertising effectiveness can provide insights into the usefulness of unpredictability. For certain cases, it would be beneficial to consider the recent research on "shockvertising." Essentially, the unexpected

nature of shocking advertisements can help in drawing audience's attention toward the advertised product or cause (Parry et al., 2013; Skorupa, 2014). The studies have shown that shocking viral advertisements increase audience involvement, the retention of brand information, the likelihood that members will share the advertisement's message, and advertisement likeability (Brown et al., 2010). Building on this perspective, it can be argued that an unpredictable increase in social media activity can particularly impact crowdfunding performance. While the unpredictability of social media activity does not necessarily defy audience's preferences and beliefs, by its very nature, it may violate potential investors' expectations in regard to the established behavior patterns of campaign founders.

We can consider the political success of the former US President Donald Trump as an example of the effectiveness of unpredictability and loudness. Throughout his campaign and subsequent time as a President, Trump routinely employed unpredictability as a key social media messaging strategy (Bentley & David, 2021). This unpredictability has been most evident in Trump's tweets; he had a penchant for using Twitter as a primary means of communication. Trump's social media strategy included producing an unprecedented volume of tweets at unpredictable timings. Trump would routinely issue tweets at off-hour times, either early in the morning before the news cycle or late at night after the prime communication hours between the mainstream news outlets and the general public. This garnered him increased media coverage and substantially magnified the ramifications of his tweets (O'Rourke, 2017; Wells et al., 2020). As a result of tweeting at unexpected times, Trump's tweets often rose above the noisiness associated with social media, and thereby exerted a significant impact in terms of communication and persuasion (Wells et al., 2020). Applying this logic to the crowdfunding context, it can be stated that an increase in social media loudness coupled with an unpredictable schedule of tweets can enhance the likelihood that messages contained within tweets are observed and understood, resulting in better campaign performance. Hence, we offer the following hypothesis:

Hypothesis 2: The relationship between an increase in Twitter activity, adjusted for project category and year, and the likelihood that crowdfunding campaigns will meet their funding goals will be moderated by the relative unpredictability of Twitter activity such that higher levels of unpredictability will enhance the positive relationship between social media activity and (a) funding goals, (b) the amount of funds raised, and (c) number of backers.*

Research method

Sample

We use three datasets to test our proposed relationships. First, we employ a third-party service (*WebDataGuru*) to collect data on Kickstarter projects launched between May 31, 2009 and December 12, 2018. The inclusion criteria of the projects are as follows: the pledged campaign amount, number of backers, whether the campaign included images and/or videos, the campaign id, campaign URL, campaign title, campaign category, campaign goal amount, and a segment of text on project description. We collect the second dataset from the *Web Robots* (Web Robot, 2019; retrieved January 5, 2019). This dataset aimed at supplementing that derived from the *WebDataGuru*, as it provides additional details on the campaign date creation, country, URL webpage, currency, whether it was a staff pick (yes/no), and the current state of the campaign (i.e., successful, failed, suspended, canceled, or live). The initial data comprised 297,795 campaigns; we had 126,828 campaigns that matched with the campaigns in the *Web Robots* dataset. We include campaigns that were either fully funded (successful) or not fully funded (failed). Hence, our final dataset comprised 120,657 campaigns. In an attempt to control for the founder's sex, using *Kickstarter_id* on the campaign page, we distinguish the

founder's sex—an approach that has been utilized to construct controls for sex (Geiger & Oranburg, 2018). However, owing to the peculiarities in the *Kickstarter_id* mnemonics, these values often do not represent the campaign founders' full names. Hence, we could not record the founder's sex in all cases. This scenario can lead to the errors of omission in the case where values for gender are missing and to the errors of commission when the founder's gender is misclassified.

We take the third dataset from the Twitter application programming interface. We scrape tweets for each Kickstarter project by searching for the word "Kickstarter" and the project name, in line with Hong, Hu and Burtch (2018a). We further exclude projects without Twitter activity. It must be noted that self-selection into Twitter activity is an important empirical point, and we lack a clear instrument explaining this self-selection. However, to overcome survivor bias to a certain extent, among those tweeting about their crowdfunding campaign, we control for all the available project data and the range of project-related dummies. In our final sample, we did not include the data of projects that had less than five tweets. Owing to constraints pertaining to the operationalization of the unpredictability measure, we did not include any project that tweeted on less than 3 distinct days. After the case-wise deletion, our final sample, depending on the outcome variable, comprises 7946 to 7980 campaigns from 2009 to 2018.

Measures

Dependent variable − met the goal. Our key dependent variable is whether the campaign met the funding goal (1=yes; 0=no). Our additional outcome variables are the log of funded amount (controlling for the log of goal amount) and the log of the number of backers.

Category-adjusted change in the log *of tweets.* We use the log of tweets associated with the project adjusted for category-year. In other words, we take the log of mean tweets for the category-year combination and subtract it from the log of tweets associated with the project. It is expressed as follows:

Category − year adjusted log of tweets

$$= \ln(1 + \text{Tweets}_{ic}) - \ln(1 + \text{Tweets}_{ct})$$

where Tweets_{ic} is the total number of tweets for the focal project i in category c. Tweets_{ct} is the average of tweets in category c during year t. In cases where a project straddles 2 years (e.g., from December 2015 to January 2016), we use the average of tweets in a category during the year of launch.

Category-adjusted tweet unpredictability. Wholey and Brittain (1989:869) define predictability as "the degree to which the future can be anticipated solely on the basis of knowledge of the past." We use their method of computing the predictability of the number of tweets daily. The expression is as follows:

$$\text{Tweets}_{id} = \alpha_0 + \alpha_1 day_d + e$$

where Tweets_{id} is the number of tweets on project i on day d. day_d is the nth day from the start of the project when there was at least one tweet. In other words, we regress future daily tweets on past daily tweets. Predictability is the R-squared (R^2) in the above regression of how well the number of future tweets can be predicted from past tweets. To calculate unpredictability, we subtract predictability from one. To better assess the tweeting unpredictability of a particular project, we wish to compare its unpredictability with other projects' unpredictability in the same category. Therefore, we subtract the mean unpredictability in tweets in a category-year from the unpredictability of tweets for a project. A higher difference indicates greater unpredictability.

Control variables. To control for post-tweet activity, we include the log of likes and log of retweets. Twitter users utilize the retweet function to share and disseminate information to build and manage relationships with others. Retweeting is a rebroadcast of the original message; hence, it exerts a chain effect to a tweet's author's followers, the sharers' followers, and so on, amplifying the audience of the content to a potentially massive scale (Lotan, Graeff, Ananny, Gaffney & Pearce, 2011). We include the log of total retweets during the campaign (Dai & Zhang, 2019). It must be noted that, since retweets are sent by other Twitter users, we do not hypothesize the main effects for this outcome owing to the lack of observables on individual re-tweeters. Twitter also enables followers to like a tweet. This feature allows followers to express positive sentiment toward the tweets; thus, a large number of likes reflect not only appreciation but also popularity within Twitter. We also include the log of total likes on Twitter during the campaign (Kindler, Golosovsky & Solomon, 2019).

We also control for the sex of the campaign founder (0=female, 1=male) (Vaznyte, Andries & Manigart, 2020) and the log of past projects from the project leader (Courtney, Dutta & Li, 2017). Additionally, we include a control for the log of the goal amount (Deb, Oery & Williams, 2019), whether at least one video was provided (1=yes; 0=no) (Mitra & Gilbert, 2014), whether the campaign was a staff pick (1=yes; 0=no) (Soublière & Gehman, 2020), and the log of total words in the campaign description (Soublière & Gehman, 2020).

We also control for a series of dictionary-based measures derived from Provalis Corporation's content analysis software. We control for ambiguity in the project description as the absolute difference in positive and negative tone words divided by the total number of positive and negative tone words. We multiply the resulting number by −1 so that higher values imply higher ambiguity. The dictionary for positive and negative words is based on Henry (2008, p. 387).

Kickstarter projects can be influenced by entrepreneurial orientation, regulatory focus, and psychological capital throughout the development of the project. Given this, the text of the project may help glean potential impetus around these key constructs in entrepreneurship. Therefore, we control for the text-based measures of entrepreneurial orientation (EO), promotion and prevention-based regulatory focus variables, and organizational psychological capital. The measure of EO is based on the dictionary of words from McKenny, Short, Ketchen, Payne and Moss (2018)). To create this variable, we take the mean of the three dimensions of EO (proactiveness, innovation, and risk-taking). We also employ previously developed and validated dictionaries for the construction of our promotion- and prevention-based regulatory focus variables (Gamache, McNamara, Mannor & Johnson, 2015). Organizational psychological (organizational optimism, organizational hope, organizational resilience, and organizational confidence) measures are based on the dictionary by McKenny, Short and Payne (2013). We use the mean of the scores on the four sub-dimensions of the organizational psychological capital. Concerning the factors affecting, it must be noted that a variety of temporal, country, and category effects may drive project success. There may be systematic variations across countries in launching campaigns; categories may also impose idiosyncratic project requirements; and variations by month, day, or year may further influence funding success. Therefore, we control for the number of days of the project. We also include 160 project-category dummies and month-of-the-year, day-of-the-week, year, and country dummies.

Results

Table 1 and Fig. 1 provide sample descriptions. Based on the included projects, approximately 61% of the projects met their funding goals. As expected, the pledged amount and backers were strongly correlated with funding success. Tweet unpredictability was negatively correlated with project success; however, the change in

Table 1
Sample description.

		Mean	s.d.	min	max	1	2	3	4	5	6	7	8	9
1	Log of pledged amount	7.2049	3.2763	0	15.6441	1.0000								
2	Log of backers	3.6960	2.0621	0	10.4787	0.9399*	1.0000							
3	Met-goal (success)	0.6098	0.4878	0	1	0.7111*	0.7306*	1						
4	Category-adjusted tweet unpredictability	0.0035	0.4391	−0.7135	0.7580	0.1726*	0.1946*	0.1240*	1					
5	Category-adjusted change in log of tweets	−0.0021	0.3817	−1.8544	1.0172	0.0028	0.0248*	−0.0055	0.3852*	1				
6	Log of likes	0.5931	0.9389	0	6.0186	−0.0726*	−0.0688*	−0.0476*	0.0044	0.1119*	1			
7	Log of retweets	0.3789	0.7601	0	5.7807	−0.0413*	−0.0387*	−0.0358*	0.0112	0.1169*	0.7647*	1		
8	Sex	0.7226	0.4478	0	1	−0.0327*	−0.0247*	−0.0596*	0.0159	0.0189	0.002	0.0128	1	
9	Log of total past projects	0.7769	0.2367	0.6931	2.9957	0.1116*	0.1596*	0.1570*	0.0112	−0.0527*	−0.0022	−0.02	0.0579*	1
10	Log of goal amount	8.7778	1.6476	0.6931	17.7275	0.2535*	0.2512*	−0.1256*	0.0987*	0.0577*	−0.0307*	0	0.0547*	−0.0990*
11	Video present	0.7673	0.4226	0	1	0.4861*	0.4480*	0.3200*	0.0992*	0.001	−0.0532*	−0.0276*	0.0124	0.0117
12	Staff pick	0.2376	0.4256	0	1	0.4278*	0.4946*	0.3373*	0.1232*	0.0543*	−0.0275*	−0.0106	−0.0414*	0.0754*
13	Log of total words	6.3772	0.7822	2.8904	8.5309	0.5437*	0.5427*	0.3256*	0.1135*	−0.0094	−0.0505*	−0.0258*	−0.0093	0.0564*
14	Ambiguity	−0.6088	0.3459	−1	0	0.0200	0.0036	−0.0102	0.0084	0.0004	−0.0004	−0.0041	0.0089	−0.0299*
15	Entrepreneurial Orientation	1.1178	1.3344	0	20.6667	0.2858*	0.2740*	0.1201*	0.0684*	0.013	−0.0242*	−0.0048	−0.0092	−0.0358*
16	Regulatory focus—Promotion focus	1.3877	2.0355	0	73	0.1361*	0.1297*	0.0503*	0.0103	−0.0034	−0.0111	−0.0119	0.0083	−0.0184
17	Regulatory focus—Prevention focus	0.7659	1.6207	0	49	0.0811*	0.0817*	0.0141	0.0314*	−0.0104	0.0082	0.0065	0.0240*	0.0043
18	Psychological Capital	1.5385	1.5417	0	20.5	0.3103*	0.3131*	0.1587*	0.0556*	−0.0064	−0.0212	−0.0094	−0.0098	0.0075
19	Days of the project	32.9672	11.0596	1	91	−0.0524*	−0.0605*	−0.1301*	−0.0207	0.0203	−0.0293*	−0.0236*	0.0232*	−0.0718*
20	Month created	6.3487	3.2471	1	12	0.0001	−0.0085	−0.0223*	0.0146	0.0117	−0.0187	−0.0205	0.0131	−0.0431*
21	Day of the week created	2.9242	1.6902	0	6	−0.0462*	−0.0569*	−0.0315*	−0.0352*	0.0049	−0.0204	−0.0148	0.0083	−0.0298*
22	Year created	2014.7920	1.8339	2009	2018	−0.0146	0.0004	0.0026	0.0039	−0.1736*	0.1268*	0.0545*	−0.0282*	0.1824*

		10	11	12	13	14	15	16	17	18	19	20	21
10	Log of goal amount	1											
11	Video present	0.1906*	1										
12	Staff pick	0.2016*	0.2475*	1									
13	Log of total words	0.2994*	0.3679*	0.3037*	1								
14	Ambiguity	0.0601*	0.0157	−0.0089	0.1176*	1							
15	Entrepreneurial Orientation	0.2485*	0.2095*	0.1767*	0.5633*	0.0700*	1						
16	Regulatory focus—Promotion focus	0.1308*	0.1091*	0.0701*	0.3849*	0.0009	0.3566*	1					
17	Regulatory focus—Prevention focus	0.1211*	0.0577*	0.0267*	0.2674*	0.1671*	0.2248*	0.1955*	1				
18	Psychological Capital	0.2123*	0.2100*	0.1507*	0.6399*	0.0465*	0.5266*	0.5450*	0.2587*	1			
19	Days of the project	0.1852*	−0.0333*	−0.0381*	−0.0298*	−0.0284*	0.0182	0.0148	0.0047	0.0009	1		
20	Month created	0.0163	0.0297*	0.0162	0.0222*	0.0167	0.0174	0.0102	0.0059	0.0137	0.0022	1	
21	Day of the week created	−0.018	−0.02	−0.0610*	−0.0454*	−0.0073	−0.0249*	0.0001	−0.019	−0.0209	−0.0164	0.002	1
22	Year created	−0.0128	−0.0604*	−0.0288*	0.0534*	0.0836*	0.0310*	0.0077	0.0859*	0.0473*	−0.1154*	−0.1417*	−0.0438*

Note.

* $p<0.05$ (two-tailed).

the log of tweets had a negligible correlation with project success. Tweets with more likes and retweets did not translate to campaigns with a higher likelihood of project success. As expected, project leaders with more past projects had a higher chance of receiving funding. In line with previous research, projects with a higher goal amount had a lower correlation with project success. Projects with at least one video, which were picked to be featured by the Kickstarter staff or had longer descriptions, had a higher correlation with project success. Finally, project descriptions with higher entrepreneurial orientation, promotion-based regulatory focus, and psychological capital were more strongly correlated with project success.

In Fig. 1, concerning the unpredictability of tweets we see a bifurcation in each category—we see two distinct distributions at the upper and lower ends of the tail. This suggests that projects systematically vary in the unpredictability of their Twitter activity. In relation to the change in the category-year adjusted tweets, we do not see a distinct distribution at the tails. However, for the Comics category, we see a somewhat uniform distribution. Concerning the count of tweets, the distribution of the tweets is more heavily distributed at the lower tail.

To test our proposed relationships, we employ the estimates of the logit (DV = met goal; Table 2) and OLS (log of the funded amount and log of backers; Tables 3 and 4). We use case-wise deletion for each of the outcome variables. Concerning the first outcome variable of *met goal*, there are 7946 observations. Concerning the remaining two outcome variables—log of pledged amount and log of backers—the sample count is 7980. For the remaining analyses, the observations for each case-wise model are listed at the bottom of the tables.

Concerning the control variables, the log of likes for tweets is positively associated with the three outcomes. However, the log of retweets is not associated with the three outcomes (model 1 in Tables 2–4). Similarly, male project leaders had lower odds of meeting
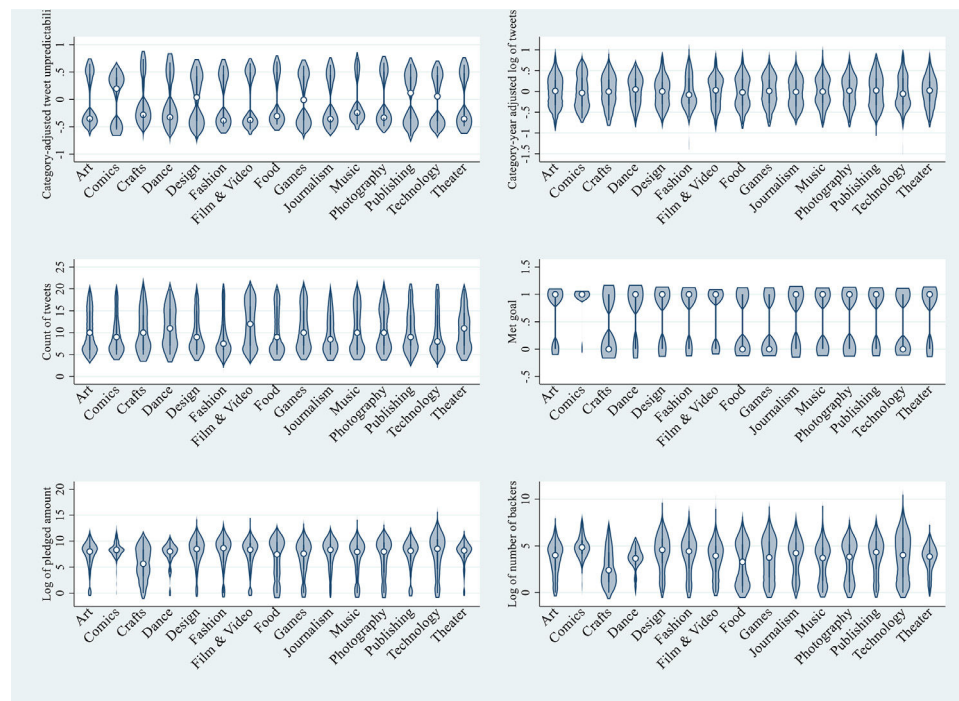
Fig. 1. Violin plots for distribution.

goals, receiving funding; however, there was no significant difference in the number of backers between male and female project leaders (model 1 in Tables 2−4). The count of past projects had a significant positive association with all the three outcomes (model 1 in Tables 2 −4). Although a higher goal amount lowered the odds of funding (model 1 in Table 2), it was positively associated with the funding amount and backers (model 1 in Tables 3−4). The presence of a video, a project selected by staff, or the length of project description were all positively associated with the three outcomes (model 1 in Tables 2 −4). Ambiguity in project description was not associated with the likelihood of meeting the goal or pledged amount; however, it was negatively associated with the log of backers. Although entrepreneurial orientation is not associated with the likelihood of meeting goals, the promotion focus slightly lowered the odds of meeting the goal (model 1 in Table 2). Prevention focus or psychological capital did not influence the odds of meeting the goal (model 1 in Table 2). For the log of the pledged amount, the effects were not significant for entrepreneurial orientation or psychological capital but were positive for both regulatory focus types (model 1 in Table 3). For the log of backers, the effects were significant for entrepreneurial orientation and both regulatory focus types but not for psychological capital (model 1 in Table 4). For the three outcomes, the days of the project slightly lowers the odds of meeting the goal, the pledged amount, and backers.

Hypothesis 1 proposed that the log of category-year adjusted tweets has a positive association with meeting the goal (model 2, Table 2: odds ratio = 1.237, $p < 0.05$), the log of pledged amount (model 2, Table 3: $\beta = 0.0889$, $p > 0.10$), and the log of backers (model 2, Table 4: $\beta = 0.174$, $p < 0.01$). The findings show that, with each percentage increase in tweets relative to tweets in category-year, there is 1.237 times increase in the odds of campaigns achieving their stated goals.

Hypothesis 2 proposed that greater unpredictability in tweets is positively related to campaign performance. Higher unpredictability with an increase in the log of category-adjusted change in log of tweets is associated with a higher likelihood of meeting the funding goal (model 3, Table 2 [$\beta = 1.659$, $p < 0.05$], and Fig. 2a), the log of

pledged amount (model 3, Table 3 [$\beta = 0.444$, $p < 0.01$], and Fig. 2b), and the log of backers (model 3 Table 4 [$\beta = 0.365$, $p < 0.01$] and Fig. 2c).

In Fig. 2(a), with an increasing category-adjusted change in the log of tweets, projects with a higher unpredictability (i.e., mean plus 1 s. d.; dashed line) have higher odds of receiving funding. Similarly, in Fig. 2(b), higher tweet unpredictability with an increase in category-adjusted change in the log of tweets, is also associated with more backers. In Fig. 2(c), an increase in category-adjusted change in log of tweets is also associated with more backers, under higher levels of unpredictability. Overall, we find support for both hypotheses. The results show that an increase in category-adjusted change in log of tweets accompanied by greater unpredictability is associated with more favorable funding outcomes.

Robustness checks

Country-category-year trends. Projects may vary systematically by category and country over time. Variations in preferences for certain projects in a country or a category may influence project success. Therefore, to control for such projects and country-related secular trends, we include dummies by country-category-year. The estimated effects can be influenced by the combined fixed effects of country, category, and year. In Table 5, by controlling for country × category × year dummies, we find that the estimates are consistent with the main analysis.

Estimates from the non-US and non-UK samples. A large number of projects in the samples are from the United States and the United Kingdom. Excluding the United States and the United Kingdom, the estimates are consistent with the main effects in Table 6 (models 1 −3).

Discussion

With an increasing prevalence of social media, standing out in the crowd has become a key priority for crowdfunding project owners. Although the traditional signaling theory may be less useful in the

Table 2
Logit regression estimates for meeting the goal.

	DV = Met-goal		
	(1)	(2)	(3)
Category-adjusted tweet unpredictability			1.613***
			(0.127)
Category-adjusted change in log of tweets		1.237**	0.990
		(0.103)	(0.0889)
Category-adjusted tweet unpredictability × Category-adjusted change in log of tweets			1.659**
			(0.345)
Log of likes	0.910*	0.902**	0.911*
	(0.0460)	(0.0458)	(0.0461)
Log of retweets	0.998	0.993	0.997
	(0.0628)	(0.0626)	(0.0629)
Sex	0.854**	0.852**	0.843**
	(0.0614)	(0.0612)	(0.0610)
Log of total past projects	2.936***	2.925***	2.897***
	(0.540)	(0.538)	(0.537)
Log of goal amount	0.591***	0.589***	0.581***
	(0.0150)	(0.0150)	(0.0150)
Video present	3.401***	3.408***	3.364***
	(0.274)	(0.275)	(0.272)
Staff pick	7.748***	7.662***	7.435***
	(0.783)	(0.776)	(0.755)
Log of total words	2.920***	2.937***	2.906***
	(0.190)	(0.191)	(0.191)
Ambiguity	0.870	0.866	0.864
	(0.0793)	(0.0789)	(0.0791)
Entrepreneurial Orientation	0.955	0.953	0.954
	(0.0286)	(0.0285)	(0.0290)
Regulatory focus— Promotion focus	0.973*	0.974*	0.977
	(0.0155)	(0.0155)	(0.0155)
Regulatory focus— Prevention focus	0.977	0.977	0.974
	(0.0174)	(0.0170)	(0.0168)
Psychological Capital	1.004	1.005	1.003
	(0.0316)	(0.0316)	(0.0322)
Days of the project	0.986***	0.986***	0.987***
	(0.00296)	(0.00297)	(0.00299)
Month created	Included	Included	Included
Day of the week created	Included	Included	Included
Year created	Included	Included	Included
Country	Included	Included	Included
163 Category dummies	Included	Included	Included
Constant	0.0474	0.0446	0.0626
	(0.0957)	(0.0926)	(0.120)
Observations	7946	7946	7946

Robust standard errors in parentheses.
*** $p<0.01$.
** $p<0.05$.
* $p<0.1$.

Table 3
OLS regression estimates for the log of the pledged amount.

	DV = Log of the pledged amount		
	(1)	(2)	(3)
Category-adjusted tweet unpredictability			0.522***
			(0.0659)
Category-adjusted change in log of tweets		0.0889	−0.170**
		(0.0696)	(0.0764)
Category-adjusted tweet unpredictability × Category-adjusted change in log of tweets			0.444***
			(0.169)
Log of likes	−0.0932**	−0.0968**	−0.0839*
	(0.0436)	(0.0437)	(0.0433)
Log of retweets	0.0254	0.0232	0.0256
	(0.0525)	(0.0526)	(0.0522)
Sex	−0.110*	−0.110*	−0.118**
	(0.0571)	(0.0570)	(0.0568)
Log of total past projects	0.612***	0.614***	0.609***
	(0.0998)	(0.0999)	(0.0996)
Log of goal amount	0.165***	0.164***	0.155***
	(0.0216)	(0.0216)	(0.0216)
Video present	1.917***	1.918***	1.888***
	(0.0822)	(0.0822)	(0.0816)
Staff pick	1.572***	1.568***	1.529***
	(0.0542)	(0.0544)	(0.0542)
Log of total words	1.436***	1.437***	1.416***
	(0.0568)	(0.0568)	(0.0568)
Ambiguity	−0.123	−0.123	−0.119
	(0.0808)	(0.0808)	(0.0804)
Entrepreneurial Orientation	−0.0156	−0.0161	−0.0161
	(0.0222)	(0.0222)	(0.0222)
Regulatory focus—Promotion focus	−0.0479***	−0.0477***	−0.0444***
	(0.0159)	(0.0159)	(0.0158)
Regulatory focus—Prevention focus	−0.0426**	−0.0425**	−0.0457***
	(0.0175)	(0.0174)	(0.0171)
Psychological Capital	0.00960	0.00963	0.0101
	(0.0287)	(0.0287)	(0.0290)
Days of the project	−0.00841***	−0.00842***	−0.00786***
	(0.00275)	(0.00275)	(0.00274)
Month created	Included	Included	Included
Day of the week created	Included	Included	Included
Year created	Included	Included	Included
Country	Included	Included	Included
163 Category dummies	Included	Included	Included
Constant	−2.884***	−2.902***	−2.548**
	(1.106)	(1.109)	(1.070)
Observations	7980	7980	7980
R-squared	0.537	0.537	0.542

Robust standard errors in parentheses.
*** $p<0.01$.
** $p<0.05$.
* $p<0.1$.

current context, our theoretical model focuses on how loudness and unpredictability in social media activity influence crowdfunding performance. We controlled for the factors driving crowdfunding success. Our effect sizes are meaningful and call for future examination of these messaging strategies.

Consistent with a variety of crowdfunding studies (Kraus, Richter, Brem, Cheng & Chang, 2016) and the broader role of knowledge and innovation in academic research, our study contributes to the knowledge of how social media communication strategies during the very early stages of innovation in the context of crowdfunding influence crowdfunding performance. Moreover, with the multi-contextual nature of innovation, our proposed framework aims to improve the understanding of innovation funding success from a perspective of communication sciences. As such, our proposed model serves to improve our understanding of the antecedents of funding success related to the use of newly emerging social media platforms.

Theoretical implications

Innovation, entrepreneurship, and knowledge are fundamental to economic growth and competitiveness (Piñeiro−Chousa, López-Cabarcos, Romero-Castro & Pérez-Pico, 2020). The popularity of social media as one of the most popular forms of communication has heightened the need to better understand how social media platforms facilitate the intersection of these key factors. Building on the evidence indicating the growing importance of social media as a key tool in the entrepreneurial process (Fischer & Reuber, 2011, 2014) and reinforcing the usefulness that campaign-related social media

Table 4
OLS regression estimates for the log of backers.

	DV = Log of backers		
	(1)	(2)	(3)
Category-adjusted tweet unpredictability			0.375***
			(0.0392)
Category-adjusted change in log of tweets		0.174***	−0.0135
		(0.0422)	(0.0452)
Category-adjusted tweet unpredictability × Category-adjusted change in log of tweets			0.365***
			(0.102)
Log of likes	−0.0451*	−0.0520**	−0.0423
	(0.0263)	(0.0262)	(0.0260)
Log of retweets	0.0206	0.0163	0.0178
	(0.0318)	(0.0318)	(0.0316)
Sex	−0.0341	−0.0349	−0.0408
	(0.0345)	(0.0344)	(0.0343)
Log of total past projects	0.584***	0.588***	0.585***
	(0.0680)	(0.0679)	(0.0676)
Log of goal amount	0.118***	0.116***	0.110***
	(0.0126)	(0.0126)	(0.0125)
Video present	0.977***	0.979***	0.957***
	(0.0459)	(0.0459)	(0.0454)
Staff pick	1.361***	1.351***	1.322***
	(0.0382)	(0.0381)	(0.0379)
Log of total words	0.867***	0.869***	0.853***
	(0.0339)	(0.0339)	(0.0338)
Ambiguity	−0.120**	−0.121***	−0.118**
	(0.0467)	(0.0467)	(0.0464)
Entrepreneurial Orientation	−0.0309**	−0.0320**	−0.0320**
	(0.0153)	(0.0152)	(0.0152)
Regulatory focus— Promotion focus	−0.0371***	−0.0368***	−0.0343***
	(0.0120)	(0.0120)	(0.0119)
Regulatory focus—Prevention focus	−0.0185*	−0.0183*	−0.0206**
	(0.0102)	(0.0101)	(0.00989)
Psychological Capital	0.0260	0.0260	0.0263
	(0.0185)	(0.0184)	(0.0187)
Days of the project	−0.00670***	−0.00672***	−0.00631***
	(0.00157)	(0.00158)	(0.00156)
Month created	Included	Included	Included
Day of the week created	Included	Included	Included
Year created	Included	Included	Included
Country	Included	Included	Included
163 Category dummies	Included	Included	Included
Constant	−3.317***	−3.351***	−3.095***
	(0.623)	(0.631)	(0.614)
Observations	7980	7980	7980
R-squared	0.571	0.571	0.578

Robust standard errors in parentheses.

*** $p<0.01$.

** $p<0.05$, and.

* $p<0.1$; the results are presented based on case-wise models for respective models; therefore, the number of observations varies across models.

activity can have on crowdfunding performance (Hong et al., 2018a), we investigate how the relative loudness and unpredictability of social media activity influences crowdfunding performance. Contributing to the relatively well-established positive relationship between social media activity, venture performance (Perez, Sokolova & Konate, 2020), entrepreneurial endeavors (Damian & Manea, 2019), and crowdfunding performance specifically (Borst et al., 2018; Lu et al., 2014), our results suggest that the louder the campaign founders are on social media (i.e., increasing their social media activity relative to the average activity undertaken in other campaigns in

their project category and year), the better their campaigns might perform in terms of the number of backers, funds raised, and the likelihood of meeting the funding goals. Given the increasingly noisy nature of social media environments (El Abaddi et al., 2011; Lewis, 2013), our findings indicate the importance of *shouting over the noise* and increasing the level of social media activity to improve campaign performance.

Our findings complement recent investigations on how transparency, or a lack thereof, might influence campaign performance. While increasing the level of contributor information available on crowdfunding platforms can increase investor's willingness to engage (Burtch, Ghose & Wattal, 2015), such increased information disclosure can lower the average contributions of investors (Hong et al., 2015). The research also indicates that the lack of information disclosure by contributors can have detrimental effects on campaign performance (Burtch, Ghose & Wattal, 2016). Our findings present an important counterpoint on the *loudness* of information presented from the perspective of campaign founders. While increased information disclosure by contributors can have potentially negative consequences, our findings indicate that the *louder* the campaign founders, the greater will be the success they experience. This adds valuable nuance to the ongoing conversation on the relationship between information, communication, and crowdfunding performance.

In addition to our findings on the potential usefulness of increasing social media activity for enhancing crowdfunding performance, we also found that the relative predictability, or the lack thereof, can enhance this relationship. In this context, *shock* advertising has demonstrated the effectiveness of such techniques in capturing audiences' attention and increasing advertising outcomes (Parry et al., 2013; Skorupa, 2014). The unexpected nature of unpredictable social media activity can have a similar effect in terms of enhancing the relationship between increased social media activity and campaign performance. Unpredictability can help founders cut through the overall noise of social media and communicate their messages to potential campaign investors more efficiently and effectively. Similar to the strategy employed by the former US President Donald Trump, entrepreneurs can combine a high level of social media activity with a relatively unpredictable Twitter schedule to disseminate messages successfully to their intended audiences, without employing loudness to rise above the high levels of noise present on social media platforms during more standard timeframes. Essentially, posting tweets at unpredictable timings increases the likelihood of drowning out the message owing to the presence of fewer active social media participants at such timings. In this context, by incorporating theoretical perspectives from recent studies of *shock* advertising, we provide a novel lens through which future research might continue to examine the factors critical to the crowdfunding process.

Practical implications

From a practical perspective, our findings suggest crowdfunding campaign founders to incorporate social media activity as a key component of their overall campaign strategy. Similar to findings emphasizing the importance of social media in the realm of political campaigns (Aragón et al., 2013; LaMarre & Suzuki-Lambrecht, 2013), our findings emphasize the importance of social media in the realm of crowdfunding campaigns. Specifically, we suggest crowdfunding campaign founders to ascertain how best to leverage their social media efforts. Supplementing the research establishing the link between general social media activity and crowdfunding (Hong et al., 2018a), our findings shed light on how specific types of social media activities (i.e., loudness and unpredictability) might further enhance the benefits campaign founders reap from active social media engagement. In this manner, we build on recent literature on the positive influence of social media exposure on crowdfunding campaigns (Burtch, Ghose & Wattal, 2013). In this regard, it could be helpful for
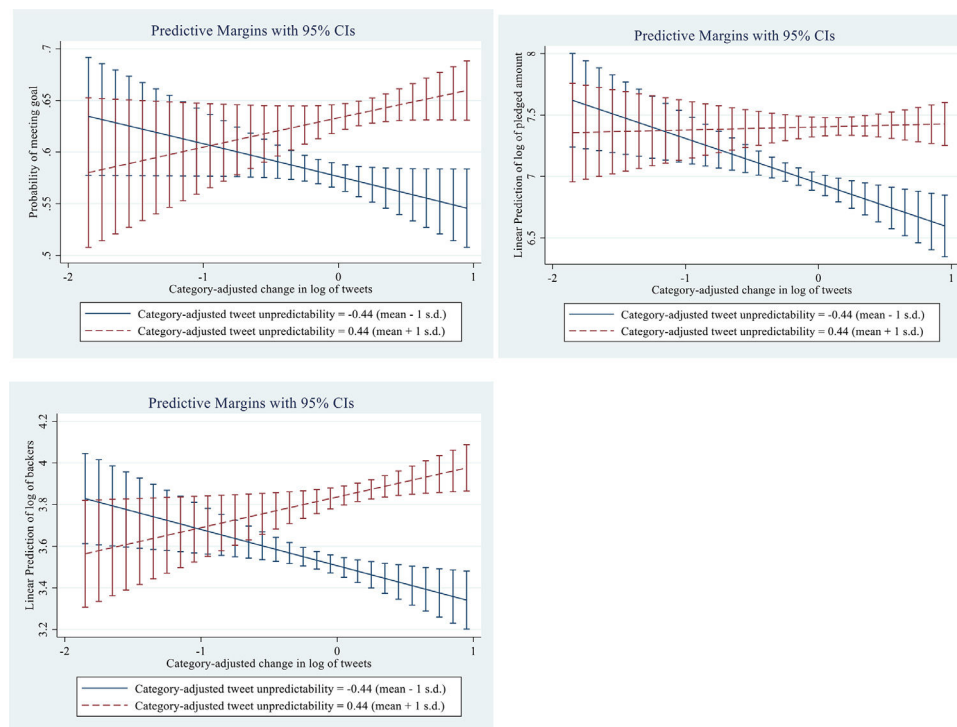
Fig. 2. Interaction plots. (a). Moderation effect on the likelihood of meeting goal. (b). Moderation effect on the log of the pledged amount. (c). Moderation effect on the log of the number of backers.

Table 5
Logit and OLS Estimates for the country × category × year dummies.

VARIABLES	(1) DV = Met-goal	(2) DV = Log of pledged amount	(3) DV = Log of backers
Regression	Logit	OLS	OLS
Category-adjusted tweet unpredictability	1.057*** (0.0130)	0.464*** (0.0724)	0.333*** (0.0434)
Category-adjusted change in log of tweets	1.007 (0.0142)	−0.118 (0.0848)	0.00852 (0.0504)
Category-adjusted tweet unpredictability × Category-adjusted change in log of tweets	1.059* (0.0334)	0.350* (0.187)	0.322*** (0.114)
Controls	Included	Included	Included
Country × Category × Year combinations	Included	Included	Included
Constant	1.110 (0.0756)	−4.809*** (0.429)	−3.813*** (0.253)
Observations	7155	7155	7155
R-squared	0.494	0.604	0.641

Robust standard errors in parentheses.
[**] p<0.05, and.
[*] p<0.1; the results are presented based on case-wise models for respective models; therefore, the number of observations varies across models.
[***] p<0.01.

founders to understand the activity of founders of other campaigns in their product category, in order to gauge their level of activities toward increasing campaign outcomes. It would also be helpful to understand the typical schedule of social media activities in which other founders participate across social media platforms. This will contribute toward a better strategy that can increase the unpredictability of social media activity and enhance the likelihood of achieving the desired results.

Our findings provide early-stage guidance on the Twitter strategy that can be adopted by project owners in a crowdfunding setting. As project owners develop Twitter messaging strategies, high-pulse, unexpected messages may play a crucial role in attracting attention

and interest. Although a body of work on the influence of social media on crowdfunding has called for visible network structures (Hong, Hu & Burtch, 2018b), the temporally driven unpredictability and loudness may be essential to draw attention to a crowdfunding campaign. As such, increasing intensity and unpredictability are essential elements to driving the message in increasingly noisy social media platforms.

Limitations and future research

It is important to note that our results should be interpreted considering their limitations. First, Twitter and Kickstarter campaign

Table 6
Logit and OLS estimates excluding US and UK Samples.

VARIABLES	(1) DV = Met-goal	(2) DV = Log of pledged amount	(3) DV = Log of backers
Regression	Logit	OLS	OLS
Category-adjusted tweet unpredictability	2.173**	0.684***	0.516***
	(0.684)	(0.220)	(0.125)
Category-adjusted change in log of tweets	0.895	−0.191	−0.0114
	(0.338)	(0.259)	(0.142)
Category-adjusted tweet unpredictability × Category-adjusted change in log of tweets	13.62***	1.197**	0.790***
	(12.09)	(0.547)	(0.302)
Month created	Included	Included	Included
Day of the week created	Included	Included	Included
Year created	Included	Included	Included
Country	Included	Included	Included
163 Category dummies	Included	Included	Included
Constant	0.0269	−3.721**	−3.755***
	(0.0688)	(1.513)	(0.918)
Observations	760	894	894
R-squared		0.635	0.672

Robust standard errors in parentheses.

*$p<0.1$; the results are presented based on case-wise models for respective models; therefore, the number of observations varies across models.

*** $p<0.01$.

** $p<0.05$, and.

data provide limited information. Although we control for a range of factors, the engagement over Twitter was subject to selection biases before and during the project. The recent evidence has also indicated the complex and nuanced network of factors influencing social media popularity (Zhao, Hu, Hong & Westland, 2000, forthcoming), which could play a role in further shaping our reported relationships. While this limitation applies to all the studies using such data, richer data derived from the daily scrapings of Kickstarter projects along with Twitter data could further shed light on these complex dynamics of engaging social media. Despite these limitations, based on a variety of specifications, the effect sizes in our sample are meaningful. Second, our inferences are limited by the cross-sectional Kickstarter data. The strategies that project launchers use after the launch are unobservable. Hence, the future research should focus on how the messaging and public relations are managed by these founders. The future research can also examine how additional strategies such as digitally nudging individuals to share content on social media could provide additional insight into these relationships (Huang, Chen, Hong & Wu, 2018). Third, the endogeneity related to engagement on Twitter is difficult to parse out in the current context. The future research can consider the unobservable variable of prior project experience; however, the choice to engage in social media can be influenced by several factors. For example, evidence indicates that there are important variations in regard to how users interact with online platforms on mobile versus non-mobile devices (Burtch & Hong, 2014). Although we explicitly focus on projects with at least five tweets, the censored part of the population—projects not using Twitter or having fewer than five tweets—remains an important unobservable component in the decision to use social media to meet funding goals.

Conclusion

The entrepreneurs on crowdfunding platforms are advised to maintain an active social media footprint. Understanding the nature and the intensity of the flow of social media messages can add further nuance to this recommendation of maintaining an active social media presence. We offer a framework that can help crowdfunding entrepreneurs develop a social media strategy. While having a mere presence on Twitter may not help entrepreneurs to stand out, ensuring a

louder presence relative to other crowdfunding campaigns in the same project category and maintaining an unpredictable schedule for the social media activity can influence their crowdfunding performance. We hope that this study primes future research on the importance of temporality during crowdfunding campaigns.

References

Allison, T. H., McKenny, A. F., & Short, J. C. (2013). The effect of entrepreneurial rhetoric on microlending investment: An examination of the warm-glow effect. *Journal of Business Venturing, 28*(6), 690–707.

Anglin, A. H., Allison, T. H., McKenny, A. F., & Busenitz, L. W. (2014). The role of charismatic rhetoric in crowdfunding: An examination with computer-aided text analysis. *In Social Entrepreneurship and Research Methods*, 19–48.

Anglin, A. H., Short, J. C., Drover, W., Stevenson, R. M., McKenny, A. F., & Allison, T. H. (2018a). The power of positivity? The influence of positive psychological capital language on crowdfunding performance. *Journal of Business Venturing, 33*(4), 470–492.

Anglin, A. H., Wolfe, M. T., Short, J. C., McKenny, A. F., & Pidduck, R. J. (2018b). Narcissistic rhetoric and crowdfunding performance: A social role theory perspective. *Journal of Business Venturing, 33*(6), 679–732.

Aragón, P., Kappler, K. E., Kaltenbrunner, A., Laniado, D., & Volkovich, Y. (2013). Communication dynamics in twitter during political campaigns: The case of the 2011 Spanish national election. *Policy & Internet, 5*(2), 183–206.

Bentley, M., & David, M. (2021). Unpredictability as doctrine: Reconceptualising foreign policy strategy in the Trump era. *Cambridge Review of International Affairs*, 1–24.

Blankespoor, E. (2018). Firm communication and investor response: A framework and discussion integrating social media. *Accounting, Organizations and Society, 68*, 80–87.

Borst, I., Moser, C., & Ferguson, J. (2018). From friendfunding to crowdfunding: Relevance of relationships, social media, and platform activities to crowdfunding performance. *New Media & Society, 20*(4), 1396–1414.

Broussard, G. (2000). How advertising frequency can work to build online advertising effectiveness. *International Journal of Market Research, 42*(4), 1–13.

Brown, M. R., Bhadury, R. K., & Pope, N. K. L. (2010). The impact of comedic violence on viral advertising effectiveness. *Journal of Advertising, 39*(1), 49–66.

Burtch, G., Ghose, A., & Wattal, S. (2013). An empirical examination of the antecedents and consequences of contribution patterns in crowd-funded markets. *Information Systems Research, 24*(3), 499–519.

Burtch, G., Ghose, A., & Wattal, S. (2015). The hidden cost of accommodating crowdfunder privacy preferences: A randomized field experiment. *Management Science, 61*(5), 949–962.

Burtch, G., Ghose, A., & Wattal, S. (2016). Secret admirers: An empirical examination of information hiding and contribution dynamics in online crowdfunding. *Information Systems Research, 27*(3), 478–496.

Burtch, G., & Hong, Y. (2014). *What happens when word of mouth goes mobile*. Auckland, New Zealand: Paper presented at the Proceedings of the International Conference on Information Systems.

Cacioppo, J. T., & Petty, R. E. (1980). Persuasiveness of communications is affected by exposure frequency and message quality: A theoretical and empirical analysis of persisting attitude change. *Current Issues and Research in Advertising, 3*(1), 97–122.

Courtney, C., Dutta, S., & Li, Y. (2017). Resolving information asymmetry: Signaling, endorsement, and crowdfunding success. *Entrepreneurship Theory and Practice, 41*(2), 265–290.

Dahl, D. W., Frankenberger, K. D., & Manchanda, R. V. (2003). Does it pay to shock? Reactions to shocking and nonshocking advertising content among university students. *Journal of Advertising Research, 43*(3), 268–280.

Dai, H., & Zhang, D. J. (2019). Prosocial goal pursuit in crowdfunding: Evidence from kickstarter. *Journal of Marketing Research, 56*(3), 498–517.

Damian, D., & Manea, C. (2019). Causal recipes for turning fin−tech freelancers into smart entrepreneurs. *Journal of Innovation & Knowledge, 4*(3), 196–201.

Datta, A., Sahaym, A., & Brooks, S. (2019). Unpacking the antecedents of crowdfunding campaign's success: The effects of social media and innovation orientation. *Journal of Small Business Management, 57*, 462–488.

Davis, B. C., Hmieleski, K. M., Webb, J. W., & Coombs, J. E. (2017). Funders' positive affective reactions to entrepreneurs' crowdfunding pitches: The influence of perceived product creativity and entrepreneurial passion. *Journal of Business Venturing, 32*(1), 90–106.

Deb, J., Oery, A., & Williams, K. R. (2019). Aiming for the Goal: Contribution Dynamics of Crowdfunding. National Bureau of Economic Research (Working Paper Number 25881). Retrieved from: https://www.doi:10.3386/W25881.

Dwivedi, Y. K., Kapoor, K. K., & Chen, H. (2015). Social media marketing and advertising. *The Marketing Review, 15*(3), 289–309.

El Abaddi, A., Backstrom, L., Chakrabarti, S., Jaimes, A., Leskovec, J., & Tomkins, A. (2011). Social media: Source of information or bunch of noise. *Paper presented at the Proceedings of the 20th International conference companion on World Wide Web.*

Elliott, W. B., Grant, S. M., & Hodge, F. D. (2018). Negative news and investor trust: The role of $ Firm and# CEO Twitter use. *Journal of Accounting Research, 56*(5), 1483–1519.

Fischer, E., & Reuber, A. R. (2011). Social interaction via new social media:(How) can interactions on Twitter affect effectual thinking and behavior? *Journal of business venturing, 26*(1), 1–18.

Fischer, E., & Reuber, A. R. (2014). Online entrepreneurial communication: Mitigating uncertainty and increasing differentiation via Twitter. *Journal of Business Venturing, 29*(4), 565–583.

Gamache, D. L., McNamara, G., Mannor, M. J., & Johnson, R. E. (2015). Motivated to acquire? The impact of CEO regulatory focus on firm acquisitions. *Academy of Management Journal, 58*(4), 1261–1282.

Geiger, M., & Oranburg, S. C. (2018). Female entrepreneurs and equity crowdfunding in the US: Receiving less when asking for more. *Journal of Business Venturing Insights, 10*, e00099.

Henry, E. (2008). Are investors influenced by how earnings press releases are written? *The Journal of Business Communication (1973), 45*(4), 363–407.

Hong, Y., Hu, Y., & Burtch, G. (2015). How does social media affect contribution to public versus private goods in crowdfunding campaigns? Paper presented at the 2015 International Conference on Information Systems: Exploring the Information Frontier, ICIS 2015.

Hong, Y., Hu, Y., & Burtch, G. (2018a). Embeddedness, pro−sociality, and social influence: Evidence from online crowdfunding. *MIS Quarterly, Forthcoming.*

Hong, Y., Hu, Y., & Burtch, G. (2018b). A shared audience amplifies people's influence over their peers. Available at: Http://eprints.lse.ac.uk/91658/1/Hong_A−shared−audience_Author.pdf. Retrieved February 3, 2020.

Huang, N., Chen, P., Hong, Y., & Wu, S. (2018). *Digital nudging for online social sharing: Evidence from a randomized field experiment*. Hawaii, USA: Paper presented at the Proceedings of the 51st Hawaii International conference on system sciences.

Kaur, H., & Gera, J. (2017). Effect of social media connectivity on success of crowdfunding campaigns. *Procedia Computer Science, 122*, 767–774.

Kindler, A., Golosovsky, M., & Solomon, S. (2019). Early prediction of the outcome of Kickstarter campaigns: Is the success due to virality? *Palgrave Communications, 5*(1), 1–6.

Knoll, J. (2016). Advertising in social media: A review of empirical evidence. *International Journal of Advertising, 35*(2), 266–300.

Kraus, S., Richter, C., Brem, A., Cheng, C. F., & Chang, M. L. (2016). Strategies for reward−based crowdfunding campaigns. *Journal of Innovation & Knowledge, 1*(1), 13–23.

LaMarre, H. L., & Suzuki−Lambrecht, Y. (2013). Examining Twitter as an online public relations strategy for congressional campaigns. *Public Relations Review, 39*(4), 360–368.

Lewis, M. (2013). *Stand out social marketing: How to rise above the noise, differentiate your brand, and build an outstanding online presence*. New York: McGraw−Hill.

Lotan, G., Graeff, E., Ananny, M., Gaffney, D., & Pearce, I. (2011). The Arab Spring| the revolutions were tweeted: Information flows during the 2011 Tunisian and Egyptian revolutions. *International Journal of Communication, 5*, 31.

Lu, C.−T., Xie, S., Kong, X., & Yu, P. S. (2014). Inferring the impacts of social media on crowdfunding. *Paper presented at the Proceedings of the 7th ACM international conference on Web search and data mining.*

Marwick, A. E., & Boyd, D. (2011). I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society, 13*(1), 114–133.

McKenny, A. F., Short, J. C., Ketchen, D. J., Jr Payne, G. T., & Moss, T. W. (2018). Strategic entrepreneurial orientation: Configurations, performance, and the effects of industry and time. *Strategic Entrepreneurship Journal, 12*(4), 504–521.

McKenny, A. F., Short, J. C., & Payne, G. T. (2013). Using computer−aided text analysis to elevate constructs: An illustration using psychological capital. *Organizational Research Methods, 16*(1), 152–184.

Mitra, T., & Gilbert, E. (2014). The language that gets people to give: Phrases that predict success on kickstarter. *Paper presented at the Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing.*

Moisseyev, A. (2013). Effect of social media on crowdfunding project results.

Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing, 29*(1), 1–16.

Nevin, S., Gleasure, R., O'Reilly, P., Feller, J., Li, S., & Cristoforo, J. (2017). Social identity and social media activities in equity crowdfunding. *Paper presented at the Proceedings of the 13th International Symposium on Open Collaboration.*

O'Rourke, M. (2017). Donald Trump: Tweeter in chief. *Risk Management, 64*(1), 40.

Parhankangas, A., & Renko, M. (2017). Linguistic style and crowdfunding success among social and commercial entrepreneurs. *Journal of Business Venturing, 32*(2), 215–236.

Parry, S., Jones, R., Stern, P., & Robinson, M. (2013). 'Shockvertising': An exploratory investigation into attitudinal variations and emotional reactions to shock advertising. *Journal of Consumer Behaviour, 12*(2), 112–121.

Pegoraro, A., & Jinnah, N. (2012). Tweet'em and reap'em: The impact of professional athletes' use of Twitter on current and potential sponsorship opportunities. *Journal of Brand Strategy, 1*(1), 85–97.

Perez, C., Sokolova, K., & Konate, M. (2020). Digital social capital and performance of initial coin offerings. *Technological Forecasting and Social Change, 152*, 119888.

Piñeiro−Chousa, J., López-Cabarcos, M. A., Pérez-Pico, A. M., & Vizcaíno-González, M. (2020a). Analyzing microblogging activity and stock market behavior through artificial neural networks. *JBAFP, 2*(2), 10.

Piñeiro−Chousa, J., López-Cabarcos, M.Á., Romero-Castro, N. M., & Pérez-Pico, A. M. (2020b). Innovation, entrepreneurship and knowledge in the business scientific field: Mapping the research front. *Journal of Business Research, 115*, 475–485.

Schmidt, S., & Eisend, M. (2015). Advertising repetition: A meta−analysis on effective frequency in advertising. *Journal of Advertising, 44*(4), 415–428.

Short, J. C., Ketchen, D. J., McKenny, A. F., Allison, T. H., & Ireland, R. D. (2017). Research on crowdfunding: Reviewing the (very recent) past and celebrating the present. *Entrepreneurship Theory and Practice, 41*(2), 149–160.

Skorupa, P. (2014). Shocking contents in social and commercial advertising. *Creativity Studies, 7*(2), 69–81.

Soublière, J. F., & Gehman, J. (2020). The legitimacy threshold revisited: How prior successes and failures spill over to other endeavors on Kickstarter. *Academy of Management Journal, 63*(2), 472–502.

Vaznyte, E., Andries, P., & Manigart, S. (2020). Are you part of the crowd? The role of sex and environmental characteristics for crowdfunding awareness. *Journal of Small Business Management*, 1–33.

Wells, C., Shah, D., Lukito, J., Pelled, A., Pevehouse, J. C., & Yang, J. (2020). Trump, Twitter, and news media responsiveness: A media systems approach. *New Media & Society, 22*(4), 659–682.

Wholey, D. R., & Brittain, J. (1989). Characterizing environmental variation. *Academy of Management Journal, 32*(4), 867–882.

Willemsen, L. M., Mazerant, K., Kamphuis, A.−L., & van der Veen, G. (2018). Let's Get Real (Time)! The potential of real−time marketing to catalyze the sharing of brand messages. *International Journal of Advertising, 37*(5), 828–848.

Zhang, F., Tanupabrungsun, S., Hemsley, J., Robinson, J. L., Semaan, B., Bryant, L., et al. (2017). trategic temporality on social media during the general election of the 2016 US presidential campaign. *Paper presented at the Proceedings of the 8th International Conference on Social Media & Society.*

Zhao, K., Hu, Y., Hong, Y., & Westland, J. C. (2000). Understanding characteristics of popular streamers on live streaming platforms: Evidence from Twitch.tv. *Journal of the Association for Information Systems.*