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Authors

Dahlhausen, Katherine

Krebs, Bethany L

Watters, Jason V

et al.

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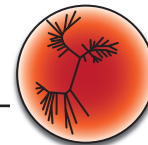
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Crowdfunding Campaigns Help Researchers Launch Projects and Generate Outreach

Katherine Dahlhausen¹, Bethany L. Krebs², Jason V. Watters², and Holly H. Ganz^{1*}

¹Department of Evolution and Ecology & Genome Center, University of California, Davis, Davis, CA 95616

²Wellness and Animal Behavior, San Francisco Zoological Society, San Francisco, CA 94132

Organizers of participatory research (citizen science) projects can generate funds and outreach through crowdfunding. Here we provide insights from three successful science crowdfunding campaigns recently completed on Indiegogo, Experiment, and Kickstarter. Choosing a crowdfunding platform that fits the project is just the beginning; a successful campaign reflects its content, management, and marketing, and some researchers may need to acquire new skills. In addition, the growing trend of crowdfunding for science reinforces the importance of academic engagement with social media.

INTRODUCTION

Crowdfunding is a method of raising funds online for a project by soliciting small donations from many people. Given that participatory research (citizen science) projects are designed to capture the interest of the public, organizers of such projects should be able to generate funds and outreach through crowdfunding. Here we provide insights from three recent science crowdfunding campaigns (Table 1). “The Koala Project” (www.indiegogo.com/projects/the-koala-project#/story) was launched on Indiegogo, a leading crowdfunding platform. “Using high-tech toys to improve foraging in captive rhinos” (<https://experiment.com/projects/using-high-tech-toys-to-improve-foraging-in-captive-rhinos>) was launched on Experiment, a crowdfunding platform focused on scientific research. And “kittybiome: kitty microbiomes for cat health and biology” (<http://tinyurl.com/kittybiome-kickstarter>) was launched on Kickstarter, one of the largest crowdfunding platforms (4).

Funding rates at the National Institutes of Health (NIH) and the National Science Foundation (NSF) have declined dramatically (8, 11, 12). In addition to being highly competitive, traditional research grants require pilot data and preliminary analyses. Consequently, many scientists are exploring new ways to augment their research funding, including crowdfunding (e.g., 2, 14, 15). While not a sufficient alternative to traditional grants, successful campaigns can fill

small funding gaps and provide a tremendous opportunity for outreach (e.g., number of page views for kittybiome, Fig. 1).

HOW TO RUN A CROWDFUNDING CAMPAIGN

The project

In order to have a successful experience, a project first needs to be “crowdfundable.” When deciding if your proposed project is suitable for crowdfunding, consider the target audience and why people contribute (Fig. 2). A successful project engages people outside of the field.

Picking a platform

Some of the most popular crowdfunding platforms (such as Kickstarter and Indiegogo) raise funds for many kinds of projects. Several smaller platforms (such as Experiment and OpenExplorer) focus on raising funds for scientific research. While the popularity of a platform

TABLE 1.

Three crowdfunding campaigns conducted in May–June 2015 to raise funding to support scientific research.

Project	Koala	Rhino	Cat
Crowdfunding platform	Indiegogo	Experiment	Kickstarter
Campaign duration	35 days	45 days	30 days
Page views	2,426	12,689	20,099
Backers	58	175	229
Funding goal	\$3,400	\$15,000	\$3,000
Amount raised	\$3,470	\$15,027	\$23,183

*Corresponding author. Mailing address: Department of Evolution and Ecology & Genome Center, University of California, Davis, One Shields Ave., Davis, CA 95616. Phone: 510-207-4408. E-mail: holly.h.ganz@gmail.com.

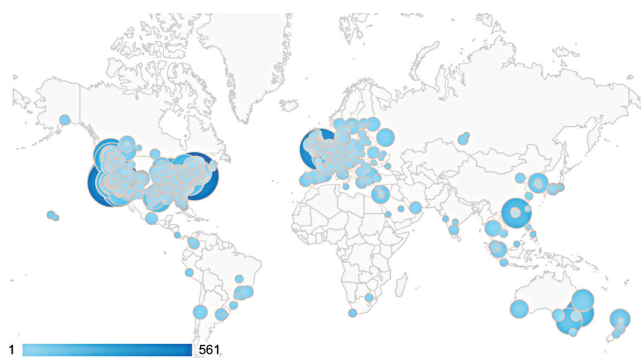


FIGURE 1. Geographic locations of page views of the Kickstarter campaign for kittybiome from Google Analytics. The colors and bubble sizes represent numbers of sessions out of a total of 20,997 page views. New users account for 82.4% (17,304) of the page views. Geographic location was not determined for 4.6% of views.

matters, a campaign's success depends largely on its content, campaign management, and marketing. There is no one "right" platform but there are some differences that may influence which platform you select (Table 2).

Fixed funding vs. flexible funding. "Flexible funding" is an option with Indiegogo and several other platforms where funds are collected regardless of whether the funding goal is met. "Fixed funding" means that funds are collected only if the funding goal is met. In Indiegogo's model, the platform fee is 5% for both fixed and flexible funding but if you select fixed funding and do not meet your funding goal, none of the contributions are collected. For Kickstarter and Experiment, all funding is fixed and all-or-nothing.

Perks. Many platforms have an option to provide perks for different funding levels of a project. Perks are helpful in motivating contributors to support a campaign and/or increase their funding level. We found that custom T-shirts, stickers, tote bags, and scarves made excellent perks that were easy to ship. Personalized tweets, postcards, one-on-one time with the researchers, and acknowledgements in publications are also popular.

Campaign flexibility. Some platforms allow you to extend the length of a campaign (Indiegogo and Experiment), allow contributions to continue after a campaign has closed (Indiegogo), or even let you change the funding goal while the campaign is active (Experiment). These options are appropriate for a project that can gain momentum with time or when you realize that your funding goal was unrealistic. For Kickstarter, the duration of a campaign and funding goal of a project cannot be changed after launch.

Designing a crowdfunding campaign

Preparing the video and campaign page are time consuming but essential for a successful campaign. These may take

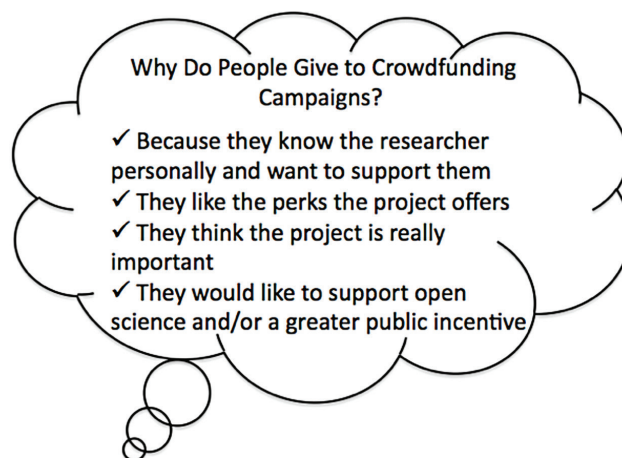


FIGURE 2. Why do people give to crowdfunding campaigns?

similar amounts of effort and time as writing a well-prepared grant proposal. Campaign managers may need to spend time learning how to create graphics, becoming adept at video editing software, and/or recruiting help with web design and illustrations. Below we outline some components of a campaign and describe what to expect.

The project title and logo. A strong title and logo are crucial to a successful campaign. Bear in mind that short titles are helpful when promoting on Twitter. Project logos are useful for the campaign and website and can be used to create customized perks.

The video. A project video is essential for a successful campaign. Campaigns lacking a video are far less likely to succeed, regardless of the platform used. A video is the easiest way to communicate the project efficiently and introduce the researchers involved in the project. Most successful campaign videos are under 2.5 minutes in length. The video is the most clear and succinct way to explain what the project is about, what you propose to do, and why it is important. Most viewers will not watch the whole video. In the video, supporting images and diagrams can be paired with audio, and text overlay can emphasize key points and define jargon. It is important to target an existing fan base while keeping a broader audience in mind. The video does not need to be filmed with professional equipment; and there are many free video-editing programs available. When recording a video for the project, it is important to use good lighting and minimize ambient noise. Also it is common to purchase stock videos, images, and/or music.

The campaign page. The crowdfunding campaign page is an essential resource that communicates what you are trying to do and how you will do it by providing details and technicalities of the research project. Successful campaigns may include many images, diagrams, and/or charts that illustrate the project's rationale. Introduce the team behind the project and outline team members' credentials.

TABLE 2.

Comparison of three popular platforms used for crowdfunding science: Kickstarter, Indiegogo, and Experiment.

Platform	Review Before Launch	Provides Analytics	Allows Perks	Flexible Funding Option	Can Change Campaign Duration or Funding Goal after Launch	Provides Receipt for Tax-Deductible Pledges	Percentage Withheld	University Overhead
Kickstarter	yes	yes	yes	no	no	Up to project creator	5% platform fee, 3–5% credit card fees, does not accept PayPal	Funds subject to university or organizational overhead if brought into university account, not for individual account
Indiegogo	no	yes	yes	yes	yes (duration) no (funding goal)	yes	5% platform fee, 3% + \$0.30 in credit card fees, 3–4% for PayPal	The University of California takes 6% overhead for Indiegogo campaigns
Experiment	yes by staff with science backgrounds	yes	not encouraged	no	yes (both)	yes	8% platform fee, 3–5% credit card fees, does not accept PayPal	Experiment has a policy that all of the funds raised be allocated to research

Provide a budget for the project and a timeline with milestones. While the campaign is live, update the crowdfunding page regularly with answers to frequently asked questions, stretch goals and links to news articles.

Setting a funding goal. A funding goal should reflect both the funding goals achieved by similar successfully funded projects and the costs of the project. This may seem counterintuitive but crowdfunding campaign funds are often raised to supplement existing funds for a study and/or extend previous research. Ideally a funding goal should cover the cost of the project, including platform fees, university fees, perk costs, shipping costs, and website and media costs. Setting a low funding goal that is easily achievable can guarantee funding. Some platforms allow teams to set stretch goals once the original goal is reached, so there is no penalty for asking for a small amount of funding and obtaining more. If outreach is important or the researchers plan to launch additional projects in the future, setting a higher goal can help to build a larger community.

Shipping costs for perks. In some platforms (e.g., Indiegogo), backers have to add the shipping amount manually and this is confusing. In this case, it makes sense to include the shipping amount in the suggested contribution amount for a specific perk. Kickstarter allows project creators to designate a shipping cost for each country that is added automatically. Be sure to determine international shipping rates ahead of time in order to avoid spending more on shipping than anticipated.

Contribution levels. The most common contribution amount to crowdfunding campaigns, regardless of the subject area or platform, is \$25. It is advisable to have a desirable perk at this funding level, as well as one at the support levels of \$5 or \$10. It is also useful to offer a perk for \$1 or some other nominal amount in order to increase your backer count. On Kickstarter (and other sites), there is a culture of backing a project with a \$1 or \$5 pledge to show support. In addition to increasing backer count (which encourages other people to back a project), these small pledges can add up. Likewise it is important to support other projects—even at a small level—and give back.

Launching the campaign. Set a launch date for a time when you can focus on running the campaign. Develop a marketing plan and set expectations for how much time will be devoted to running the campaign. Prepare a list of e-mail addresses of friends, family, colleagues, corporate sponsors, and press who will help kick off your campaign—a campaign that, once launched, should progressively engage people beyond your more established social networks (Fig. 3, Table 3). Other ways to market your project include creating a Twitter account, setting up a Facebook Page, creating a website and starting a blog.

Post campaign

Once a campaign has finished, the process is far from over. Depending on the number of contributors and the types of perks, it takes a lot of effort to fulfill perk obligations.

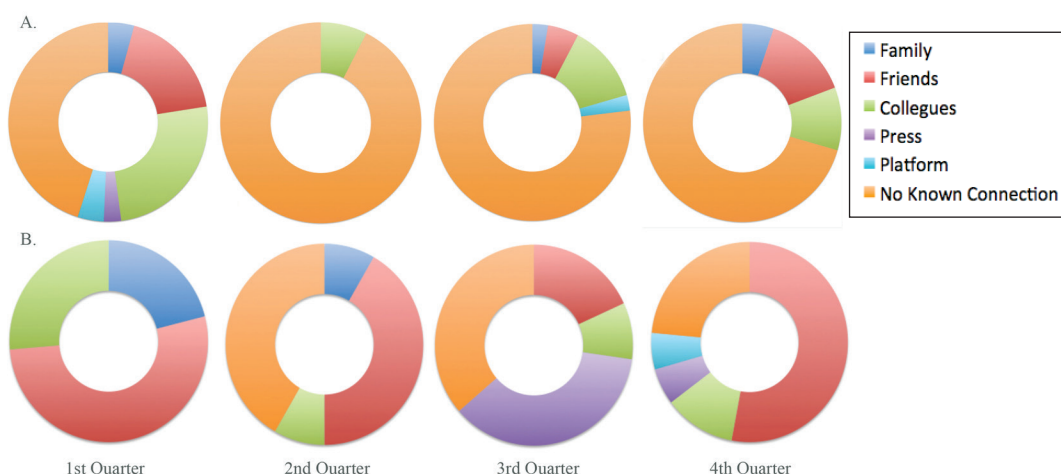


FIGURE 3. Friends, family, and colleagues provide a kickstart in two successful crowdfunding campaigns. Proportion of donations from different sources for each quarter of the campaign for A. kittybiome and B. The Koala Project. In the figure legend, "No known connection" means that means that the project backer wasn't in our primary or secondary social networks.

If the research project is through an institution that is new to crowdfunding, navigating the bureaucratic terrain may be time consuming and may cause delays in receiving the funds raised. Finally, to maintain outreach for your project, it is essential to stay connected with contributors by providing regular updates.

The emotional toll

The intense emotional ups and downs are often overlooked when considering a crowdfunding campaign. The initial phases of the project are very exciting, but making your first video or creating your first website may be frustrating. Getting to the point of the campaign launch instills a sense of pride and accomplishment, especially when validated by the contributions that come in during the first 48 hours. Maintaining this momentum is challenging, and you may feel uncomfortable soliciting money from friends and family. It's advisable to have a good support network, pace yourself, and take breaks.

We have described some components of successful crowdfunding campaigns. Next we share our individual experiences in crowdfunding for science.

"The Koala Project" on Indiegogo – Katherine Dahlhausen

"The Koala Project" is an individual research project designed to study how antibiotics affect the gut microbiome health of koalas. I sought crowdfunding because I needed pilot data for grant applications, and family and friends expressed interest in supporting the project. I chose Indiegogo because it was the only crowdfunding site associated with University of California, Davis.

For new campaigns, Indiegogo employs an algorithm called the GoGo Factor that requires you to create traffic

to your campaign from your immediate network before the project is searchable on their site. It did not take long to get a high enough GoGo Factor for my campaign to show up, but this was confusing at first. While the generosity of friends and family was amazing, my funding goal would not have been met if not for articles written in the popular press that allowed the project to reach people outside of my established social network (Fig. 3). I really liked that Indiegogo offered me opportunities to extend my campaign because I was still bringing in contributions during the last week of my campaign. And because my campaign was successful, they offered an opportunity to have the campaign remain active indefinitely (or "InDemand") after the campaign ended.

When making a contribution to the campaign, individuals selected an amount to contribute and then were directed to another page where they could select the perks they wanted. This was confusing and resulted in many people e-mailing to say that they contributed but could not select a perk. I liked that, as a contributor on Indiegogo, you can make your name, the amount of your contribution, or both, anonymous.

"Using high-tech toys to improve foraging in captive rhinos" on Experiment.com – Bethany L. Krebs and Jason V. Watters

"Using high-tech toys to improve foraging in captive rhinos" is a collaborative project between behavioral wellness researchers at the San Francisco Zoo and TGiF, an engineering and design team. The behavioral wellness program promotes well-being of animals by providing novel enrichment opportunities for the animals to engage with their environment. TGiF successfully crowdfunded the development and production of a puzzle feeder for dogs, the Foobler, in early 2014. The wellness team wanted to create a super-sized Foobler as an enrichment device for the zoo's rhinos. We decided to try crowdfunding because funding

through traditional grant sources seemed unlikely, and we wanted to build a community interested in supporting animal wellness efforts at the zoo. We chose Experiment because of the site's scientific community and focus on communicating results to backers.

At the conclusion of the campaign, we sent a brief email survey to our backers to determine where they learned about the project (Table 4) and where they were located geographically. Most respondents (63%) lived in the San Francisco Bay Area, with the remaining 37% spread over 17 states (including CA) and two countries (Australia and United Arab Emirates). Institutional outreach by the zoo, including e-mails, website links, and Facebook posts, accounted for the largest group of backers (19%, Table 4).

One tool that proved useful for outreach and publicizing the campaign was the Twitter account set up for one of the zoo's black rhinos (1, 6). A previous study using Twitter for outreach in zoos found that people engage more with tweets

coming directly from animals in a "first-person" voice, and when tweets include pictures (5). We based the Twitter account around these findings, tweeting in the first person and including photos of the rhino with every tweet. Interacting with the Twitter account helped campaign backers connect more with the rhinos and the goals of the campaign, and multiple contributors who found the campaign through Twitter made comments to this effect. Ultimately, Twitter followers accounted for about 13% of our backers and 13% of the funds raised during the campaign (Table 4).

Experiment provided several unique features we found beneficial to the campaign. Hosting only science projects, Experiment focuses on sharing scientific process and results. Researchers have the option of providing additional incentives, but backer rewards are not the main focus of the platform. At the end of a successful campaign, researchers receive all of their funding (minus platform and credit card fees) with no "hidden" costs associated with incentives, and there is a built-in blog-style update section for sharing research process or results through Experiment's "Lab Notes." The community of Experiment members was also conducive to finding an audience of science-minded people interested in supporting research.

The overall experience of using Experiment was positive. However there were a few minor drawbacks. Campaigns are all-or-nothing, and although this model is not unique to Experiment, it is worth considering when choosing a platform or setting a funding goal. During the rhino campaign, Experiment did not allow anonymous donations, which may have deterred some donors from contributing. Finally, Experiment is a smaller platform with a significantly smaller online community compared with Kickstarter or Indiegogo. Researchers should balance the pros and cons of reaching a smaller, more targeted audience versus a larger one when choosing a crowdfunding platform.

"kittybiome: kitty microbiomes for cat health and biology" on Kickstarter – Holly H. Ganz

Kittybiome is a collaborative project to sequence gut microbiome samples from cats. Modeled on a similar participatory research project for humans where participants submit fecal samples for bacterial characterization, we are characterizing the gut microbiome of domestic cats with a range of health conditions, different geographic locations, different lifestyles, and different diets. We used crowdfunding for this project to garner pilot data needed to support grant applications to more traditional funding sources. We selected Kickstarter after attending a Science x Kickstarter Hackathon that provided insights into how to run a successful campaign. Prior to launch, we received approval from our institutional review board (IRB) for the survey associated with the project, and we obtained scientific collecting permits.

When we were setting up the campaign, we signed up for a free Google Analytics account that provides a UAT

TABLE 3.

Source of backers for the Koala Project (Koala) and kittybiome (Cat) regardless of contribution level, based on dashboard analytics provided by Indiegogo and Kickstarter, respectively.

Source	Koala (%)	Cat (%)
Direct (e-mail, etc.)	37.9	24.9
Facebook	24.1	2.2
Platform	15.5	24.9
Press	8.6	10.5
Twitter	8.6	25.3
Google.com	5.2	6.6
Unknown	0.1	1.7
Project website	NA	3.9

NA = not applicable.

TABLE 4.

Source of backers for the Rhino project based on responses to a survey (104 out of 175 backers responding).

Source	% Backers
Colleagues	1.0
Facebook	16.3
Family	12.5
Friends	10.6
Institutional outreach	19.2
Press	8.7
Platform	11.5
Other social media	6.7
Twitter	13.5

code that can be embedded in the website or entered into the Kickstarter campaign page. Google Analytics allows an understanding of where the traffic to the project's Kickstarter page comes from, including sources such as Twitter, Facebook, Kickstarter, the project website, etc. (Table 3). In addition, the geographical reach of the campaign can be visualized in page views (Fig. 1) and contributions.

We were very happy with our experience; we were selected as a "Staff Pick" and featured in different places on Kickstarter, which helped drive traffic and contributions (Table 3). Although a substantial number of contributions arose from the Kickstarter platform, many more backers and viewers resulted from our direct e-mails, activity on Twitter and Facebook, and articles written about the project (Table 3) (3, 7, 9, 10, 13, 16). As a successful completed campaign, Kickstarter gave us a Spotlight page, a permanent editable page where we provide project updates. We also created an ongoing FundRazr campaign to allow people to continue to join and support the project (<http://tinyurl.com/kittybiome-fundrazr>).

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