Investigating the Supply and Demand for Crowdsourcing with Field Experiments

Harvard collaboration with HeroX[1]

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Abstract

We describe two field experiments to pursue with HeroX. The first aims to examine the competitive-collaborative orientation of a platform, the gender distribution of participants, and their interaction. Women have been documented to have a distaste for competitive compensation, whereas men exhibit an excessive preference for competitive compensation. How these preferences may manifest in crowdsourcing platforms is unknown. The second project examines barriers to adoption of crowdsourced production. As a new technology, adoption may be hampered by uncertainty around: what can be produced, the quality of production, and how to manage the process. This project tests whether helping organizations with financial incentives, training sessions, or information about how to run a crowdsourcing initiative can improve participation and outcomes.

Project A

Background Information

Though the proportion of Internet users is nearly the same across the genders, researchers have found significant gender imbalances in online behavior: only 13 percent of Wikipedia contributors are women, less than 5 percent of StackOverflow users answering technical questions are women, and women make up a very small fraction of people going to hackathons or taking part in online competitions on crowdsourcing platforms (Innocentive, TopCoder, Kaggle).

The reasons behind this gender gap are not fully understood. However, it is clear that it is not due to discriminatory rules put in place on these platforms. Rather the culprit seems to be a mix of psychological motivations and institutional characteristics of the platforms that inadvertently promoted an imbalance. Here we list a few important ones.

- **A difference in preferences.** Men and women seem to have different attitudes towards computing environments: men appear "naturally" attracted by computing tasks (Margolis 2003).
- **Gamification & incentives.** Platforms use incentives and game design elements to engage their members: lotteries, tournaments, races, rankings, etc. These incentives might inadvertently stimulate an imbalanced participation: women seem less competitively inclined than men and more risk averse.
- **Platforms are open.** If there are biases in the general population of internet users, then these are reflected also in online platforms. For example, Hannak et al. (2014) finds that women receive fewer reviews after they complete a job on TaskRabbit, a marketplace for freelance tasks.

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This project examines the first and second issues. The intellectual merit of the project is to use experimental methods to test different hypotheses in the context of HeroX, a well-established crowdsourcing platform.

Experimental design

The experiment consists of two main interventions that we describe below.

Intervention 1

A first intervention consists of providing platform members information about the gender composition of the most "active" other members to allow a comparison between different treatments: a same-gender treatment (we show only members of the same gender of the one receiving the solicitation), a distinct gender treatment (we show only members of the opposing gender of the one receiving the solicitation) and a mixed-gender treatment (we show members of both genders).

Research goal

Understanding how the perceived gender composition of the other members of the platform affects individual decisions to participate.

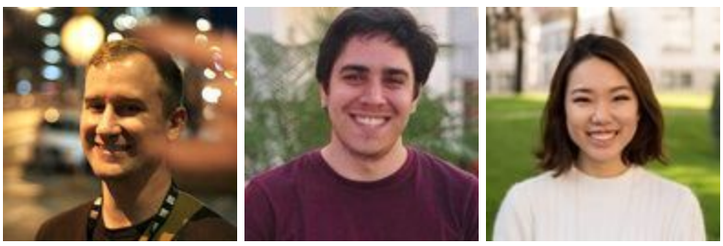
Implementation

In each treatment, everyone is sent a generic solicitation email (it could also be a newsletter email) featuring the profile of 2-3 platform members, a two-sentence description of what they did on the platform and a picture of their profile (where gender is recognizable). See the Figure 1 below for a mock solicitation email.

Dear XXXX,

[Some call to action] Join the other members of our platform and work on the newest challenges on our site

Here are some of our HeroX heros who have already done it



Steven LaJolla Josh Nickerson Melissa Tiel

[follows brief description of contributions for Steven, Josh and Melissa.]

Figure 1. Mock solicitation for the first intervention about the perceived gender composition of the member base. ***Treatment consists of changing the gender of the members featured in the email.***

Intervention 2

A second intervention consists of fostering team formation with incentives. The incentives are randomized to allow a comparison between different treatments: a collaborative treatment (e.g., awarding extra cash prizes conditional on forming a team and making a submission), a competitive treatment (e.g., awarding extra cash prizes conditional on making a submission regardless of team formation), and a baseline (e.g., no extra incentives).

Research goal

Understanding how incentives to collaborate or compete affect participation and how these might differ between the genders.

Implementation

In each treatment, members are sent a solicitation for a specific challenge (to be identified). The text includes a brief description of the challenge introducing the problem and the description of the incentives of each treatment: pro-team formation, competitive, and baseline incentives. Each member is also asked in the email to click to enlist in the pool of potential team members which we will make available online to everyone to form a team. See figure 2 for a mock solicitation email. If possible, team formation should be managed to avoid the formation of between-treatments teams.

Budget

We plan to award $25 cash prize per person (about the hourly wage of an average worker in the US). Only submissions ranked above the median will be eligible for prizes and we will restrict the total number of prizes awarded (e.g., only top 200 prizes).

Hello XXXX,

[Standard solicitation] You're invited to take part in a brand new challenge "Name of the Challenge."

[Treatment] **You will be awarded additional $25 in cash if you form a team and make a submission of quality above the median.**

Click here if you want to be added to a list of potential teammates for this challenge.

Good Luck!

HeroX Team

*Figure 2. Mock solicitation for the second intervention about the incentives to collaborate. Treatment consists of changing the incentives offered in the second line of the email. The competitive treatment is: "**You will be awarded additional $25 in cash if you make a submission of quality above the median either as a team or alone"** The baseline treatment does not mention any extra incentive.*

In both interventions, the dependent variables of interest are participation in one or more challenges, pageviews, submissions, and the cooperation rate, which is the fraction of participating individuals seeking to form a team.

Project B

Background information

From the point of view of an organization, choosing whether to invest money and resources in crowdsourcing initiatives is at least as complicated as adopting a new technology. The lack of previous experience creates additional uncertainty about the costs and outcomes of adoption. This project examines the barriers to adoption that organizations face. The intellectual merit of this project is to examine alternative policies to favor adoption via randomized controlled trials.

There are three areas of experimentation we are interested the most.

1. Pricing. The effect of promotions on sales has attracted much attention in both offline and online settings, but empirical evidence on the adoption of crowdsourcing methods is a largely unexplored field.
2. Information provision. Here the focus is on measuring the effectiveness of different forms of advertising within the context of open innovation.
3. Training. Offering training programs can lower setup costs and increase participation and outcomes.

Experimental design

We design experimental campaign ads with different incentives for organizations to sponsor a crowdsourcing competition on HeroX.

- **Uncertainty that crowdsourcing exists.** Simple advertising of the platform. Informing organizations that the platform exists can be expected to have some impact. This treatment serves as a control versus additional incentives.
- **Uncertainty about quality of the outcomes.** A mechanism is offered to ensure that outcomes are only paid for if they meet an organization's acceptable quality level.
- **Uncertainty about managing the process.** We advertise the opportunity to register for a few (online) training sessions on how to design and run a challenge.
- **Cost prohibitive.** We offer a subsidy to run the first challenge on the platform (the nature of the subsidy to be discussed).

In each treatment, the organizations showing an interest in participating are contacted and administered a short survey.