Gender Imbalance Online

CIL Lab Meeting

April 9, 2017

Introduction

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- Wikipedia entries about women are less likely to be complete
- Only 5% women contributors on StackOverflow
- Less than 5% women taking part in programming competitions (despite 30% in CS schools)

Implications for individuals, firms & society

Profits of online companies (e.g., Airbnb)

- Narrow participation $\rightsquigarrow$ lower profits
- Less diversity & creativity for innovation

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Labor market discrimination

- Signaling skills
- Learning

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Cultural discrimination

- Platform content may reflect biased views

A theory of gender imbalance

Many factors to consider (see Lam et. al 2011)

We conjecture:

- **Gamification** & Incentives (e.g., competition, points, rankings)
- Gender differences in **preferences** (e.g., risk aversion, competitive inclination)

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Mechanisms under investigation

1. Perceived gender composition in a competitive environment.
2. Collaboration incentives under gender imbalance [next study]

The role of the perceived gender imbalance

Bayesian updating

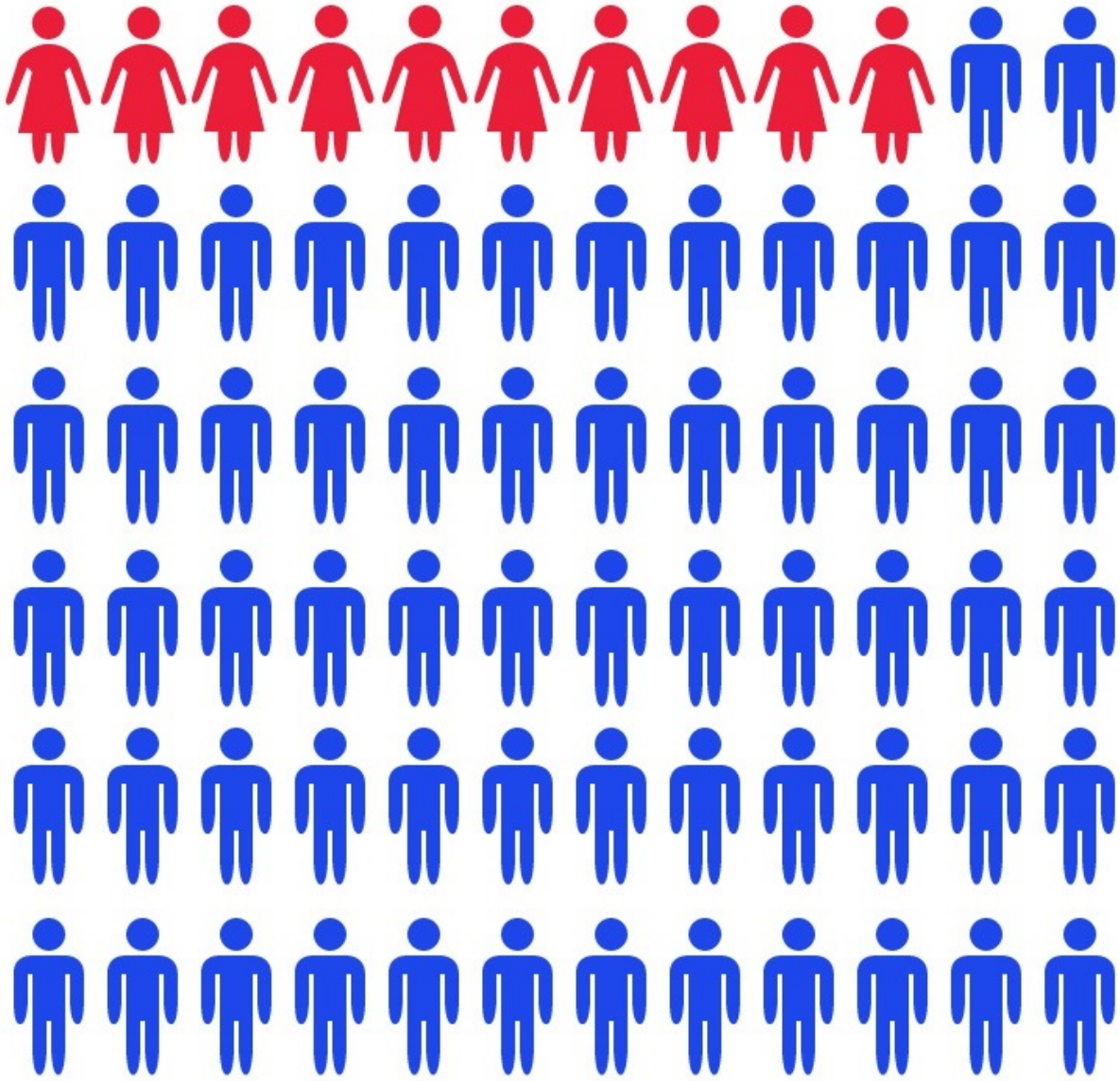


Figure 1: What are the odds of winning for gender XY?

Role model

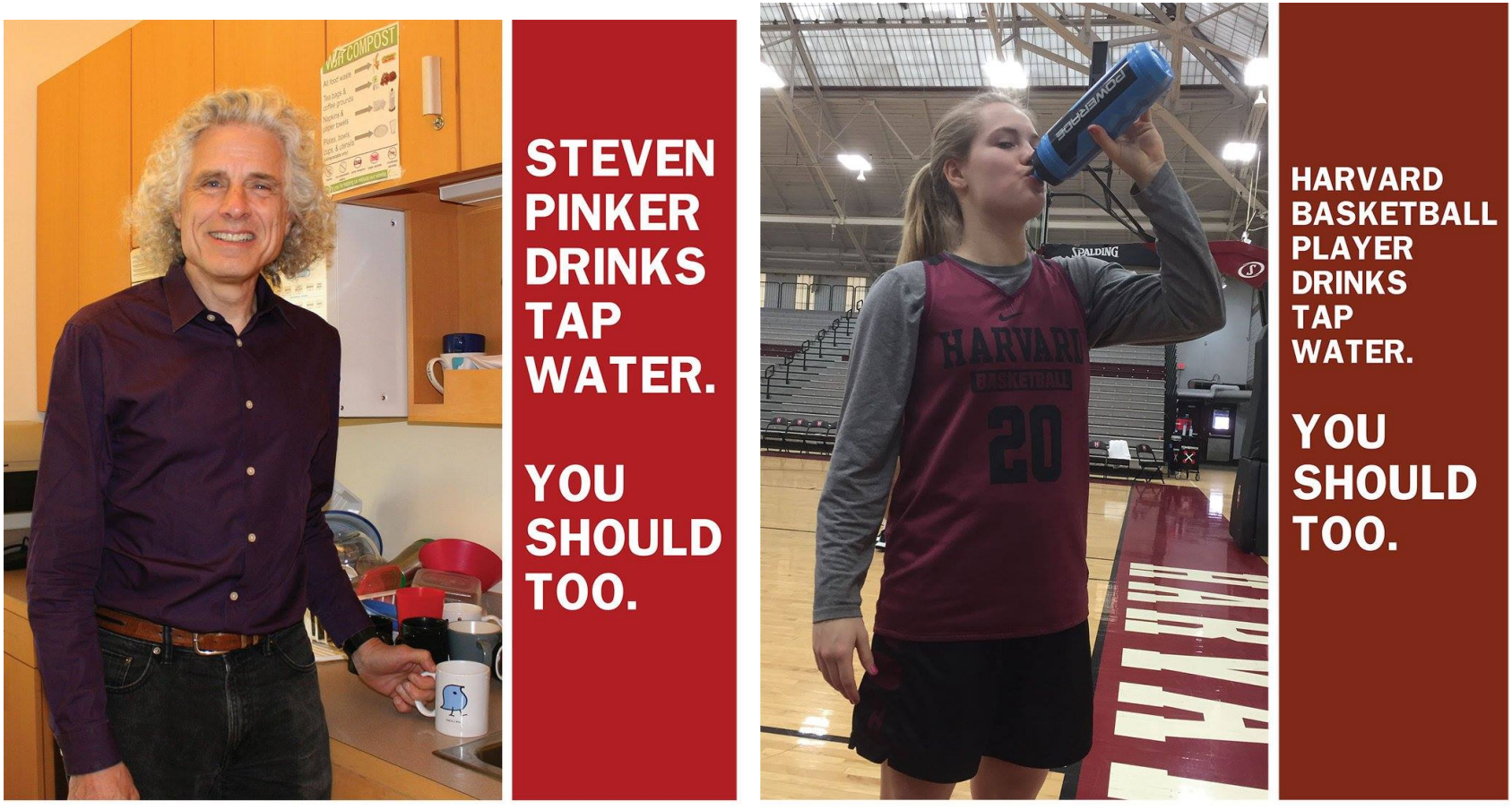


Figure 2: do I want to be successful in this?

Role Models and Arguments for Affirmative Action

By KIM-SAU CHUNG*

The value of women faculty role models at the college or university level cannot be stressed too much. A substantial amount of talent that would otherwise flow into this profession is lost because, without the presence of women faculty, undergraduate women erroneously assume that economics is a profession for men only. An exclusively male department also lacks the abilities to correct these impressions, not least because men economists themselves overlook the difficulties subsumed under the cliche "economics is a man's field." *A woman economist can provide encouragement and proof that it is possible not only to survive but to accomplish,* even as a member of a tiny minority group. (American Economic Association Committee on the Status of Women in the Economics Profession, 1973 p. 1054; emphasis added)

> those of their race or sex *can* become accepted, successful professionals. [...] [B]lack and women students do need role models, they do need concrete evidence that those of their race or sex can become accepted, successful, professionals—plainly, you won't try to become what you don't believe you can become. (Thomson, 1977 pp. 22–23; emphasis is original)

Yet what are role models? Anita L. Allen, an advocate of affirmative action, points out that academics have failed to clearly define the term during discussions. Allen (1995) finds that there are at least three different definitions of role models floating around, and argues that the ambiguity of the concept has undercut many role-model arguments for affirmative action.

The three definitions Allen identifies are:

Figure 3: American Economic Review, 2000

Context and Data

Herox.com

The sex ratio is:

- 2 men registrants for each woman (33 percent women)
- 3 men contributing for each woman (25 percent women)

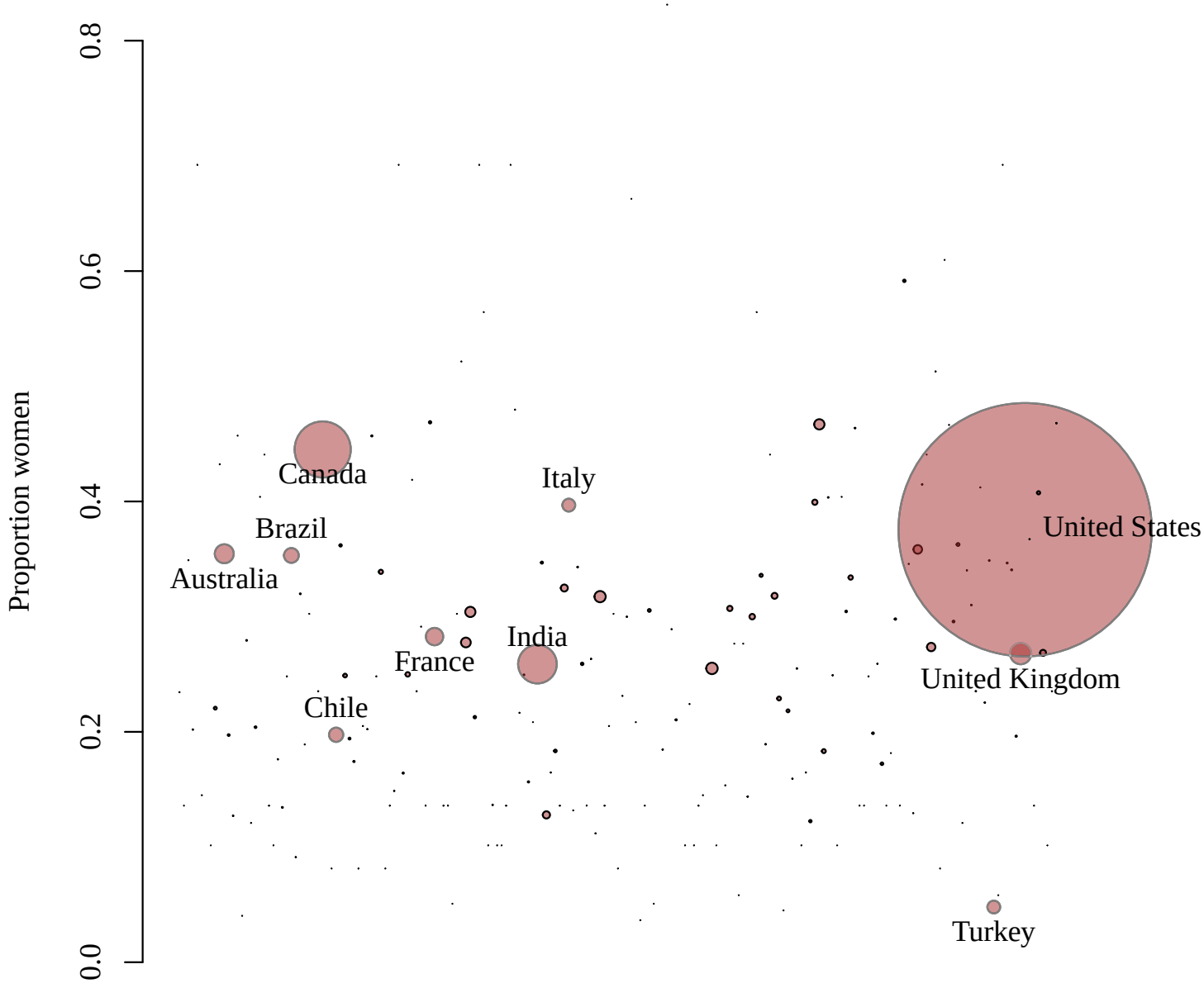


Figure 4: Proportion of women members by country

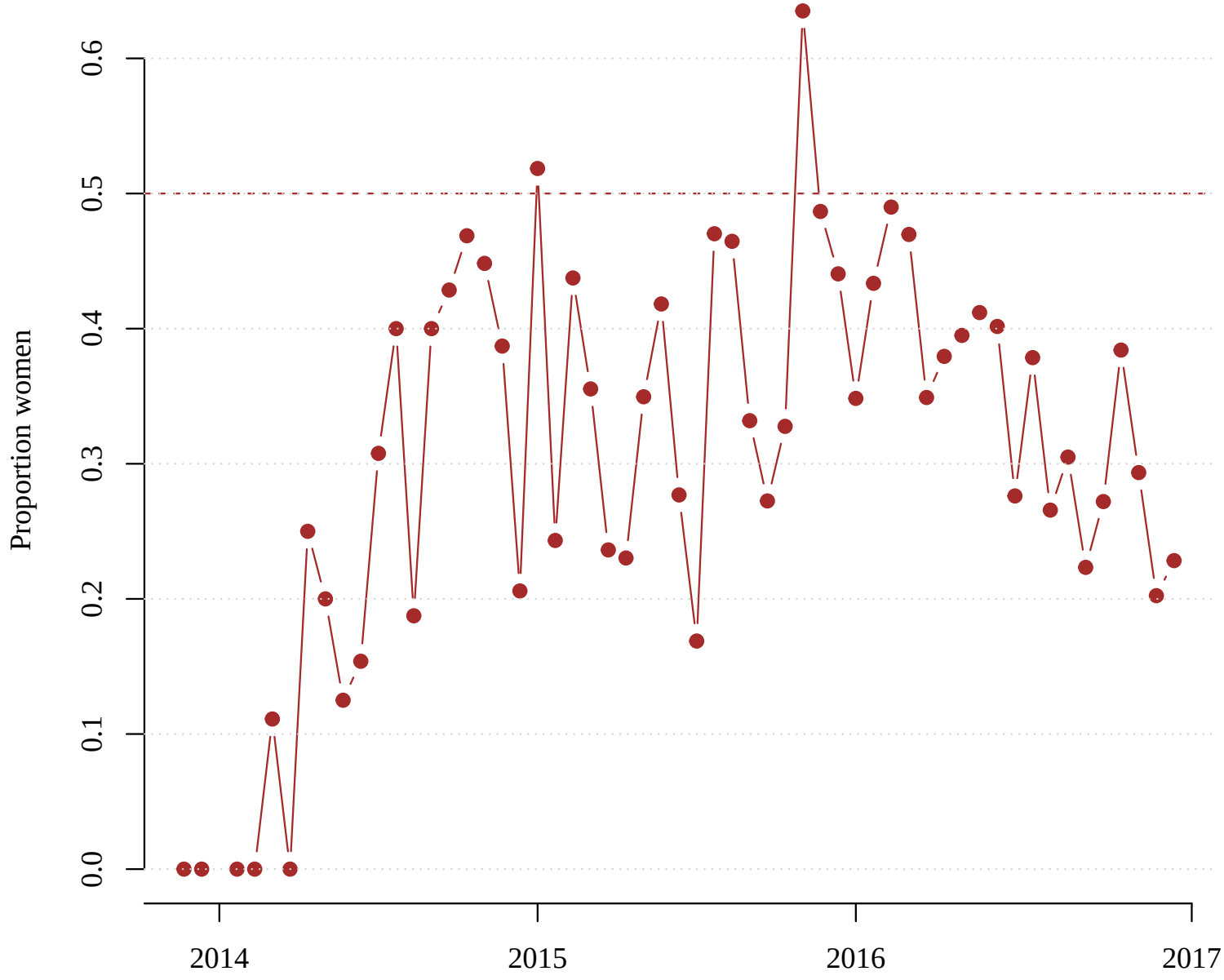


Figure 5: Proportion of women new members over time

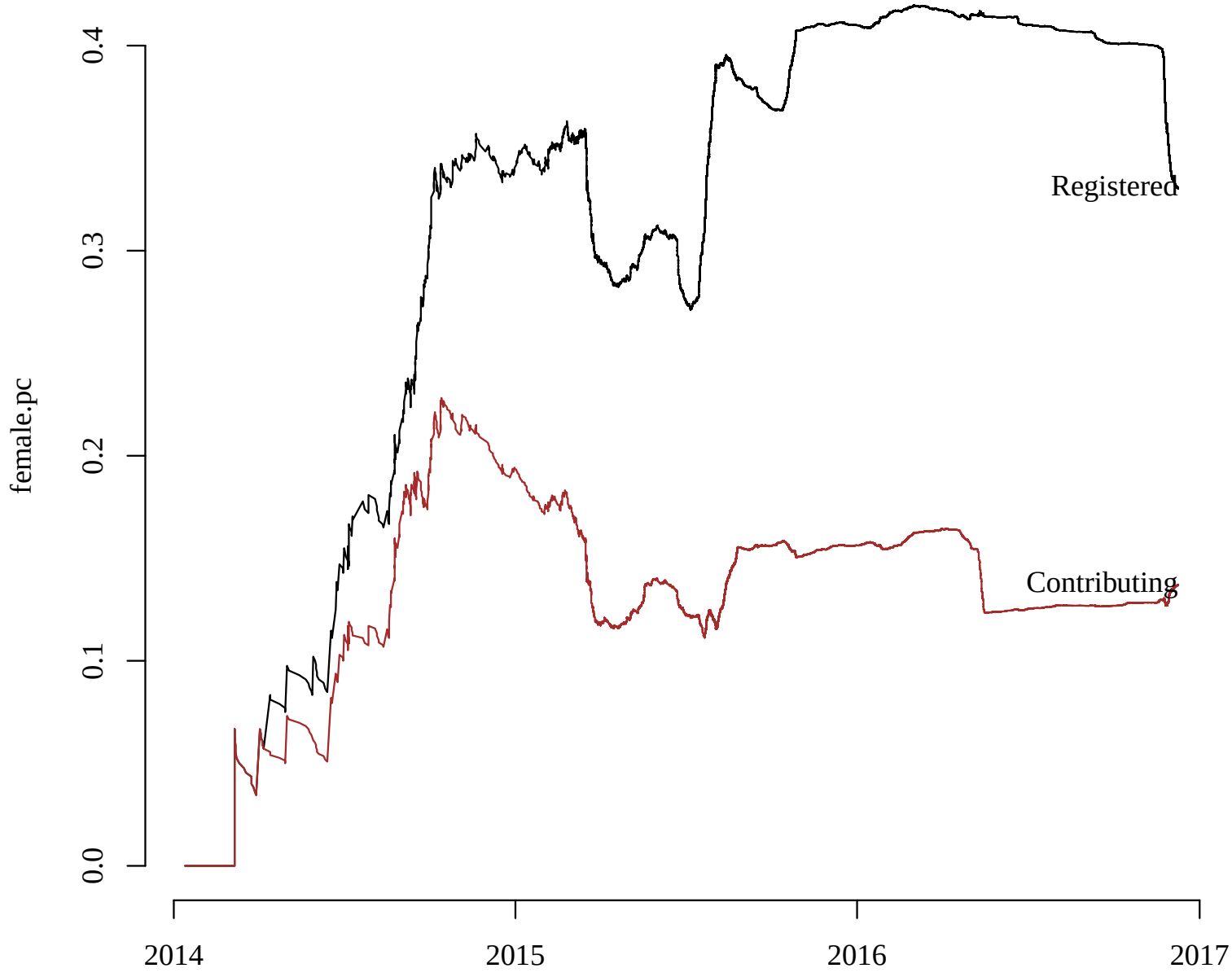


Figure 6: Cumulative proportion of women over time

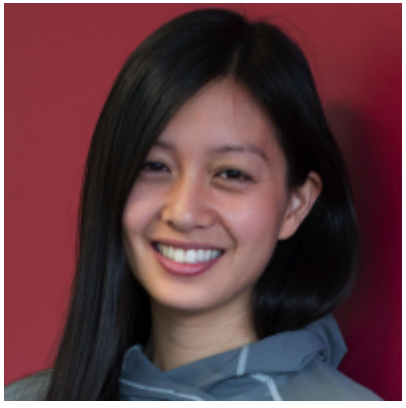
Experimental design

How to influence the perceived gender composition?

Featuring 2-3 member profiles.

- experience + bio + profile picture
- ADD regression controls for past experience on platform

Example of HeroX's member



Jessica is currently wrapping up as a graduate student at Stanford. She led youth engagement at D-Lab at the Massachusetts Institute of Technology, which collaborates with communities facing economic poverty to design technologies to improve quality of life. She co-founded a social enterprise based in West Bengal, India that aims to increase access to clean drinking water through affordable community chlorination devices.

Whom to influence?

Registered members (increase participation)

- Direct solicitation email

Not yet registered members (foster registration & participation)

- Mailing lists, Facebook ads, etc. (can we track?)

Example email solicitation

Subject: "Become a HeroX hero!"

Dear [First name],

[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 heroes

Steven is [Steven's bio]

John is [john's bio]

Melissa is [Melissa's bio]

Enter one of our new challenges on the site:

- Challenge "X" ($3,000)
- Challenge "Y" ($120,000)
- Challenge "Z" ($11,000)

Figure 7: Solicitation email

Treatment

- Vary gender composition (look at "Tokenism")
- Vary "success" composition

	Var1	Var2
1	1 man role model	3 women
2	1 woman role model	3 women
3	1 man role model	1 man 2 women
4	1 woman role model	1 man 2 women
5	1 man role model	2 men 1 woman
6	1 woman role model	2 men 1 woman
7	1 man role model	3 men
8	1 woman role model	3 men

Table 1: Treatment combinations

Facebook/Twitter ads

Challenge	11/28-12/4 AEM			
Twitter	**Actual**	**Goal**	**%of Goal**	
# of click-throughs for challenge page	8	20		
# of re-tweets	9	105		
# of favorites	8	142		
# of #impressions	4,355	2,665,392	0.16	
Facebook				
# of link clicks	8	13		
# of post likes	10	5,000		
# of post comments	1	13		
# of post shares		8		

Figure 8: Some statistics

Validation of profiles

Goal: comparable profiles

Use demographics + in the lab ratings of 20-30 profiles

- Physical attractiveness (based on user profile picture)
- Role model (bio description + picture)
- Skills

Timing of the experiment

1. Preliminary survey (calibrate perceived gender composition)
2. Solicitation (email sent 1-2 times)
3. Ex-post survey (detect possible changes on perceived gender composition)

- Outcome variables: participation, effort, team formation, etc.

Example survey

1. Demographics (age, gender)
2. Motivations to participate in HeroX
   - [Cash prizes]
   - [Learning]
   - [CV/job opportunity]
   - [Help society]
3. What challenges do you like?
   - [STEM]
   - [Social impact]
   - [else]
4. Estimate platform composition?
   - [Gender]
   - [Age]

Next steps

1. Identify profiles and ask for their consent (picture)
2. Recruit students to validate profiles
3. Send out preliminary survey
4. Ultimate solicitation message
5. Ads campaign with profiles
6. Examine results

Collaboration incentives

Basic idea

1. Male-female rich environment (how many teams?)
2. Splitting the pie rules (how many teams?)
3. Self-confidence

Technical requirements

- Creating non-overlapping lists of potential teammates
- Randomize composition of pool of potential teammates
- Offer different incentives

Example teaming

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 9: Teaming experiment

Thanks

Demand estimation of the challenges

Basic idea

Launch `LinkedIn` campaign offering different pricing schemes

Examples:

1. Fees vs no fees
2. Subsidizing prize money
3. Information treatment