

Designing Field Experiments at Scale (SOC 412)

Feb 5, 2017

Shererd Hall 306



J. Nathan Matias

@natematias

civilservant.io

jmatias@princeton.edu

Department of

Psychology





Image Source:
Wikimedia

French legislators approve law against Web sites encouraging anorexia and bulimia

By DOREEN CARVAJAL APRIL 15, 2008

PARIS — In the capital of high fashion and ultrathin models, conservative French legislators adopted a pioneering law Tuesday aimed at stifling a proliferation of Web sites that promote eating disorders with "thinspiration" and starvation tips.

The bill, approved by France's lower house of Parliament, still faces a vote in the Senate. But if passed, it would take aim at any means of mass communication - magazines, blogs, Web sites - that promote eating disorders like anorexia or bulimia with punishments of up to three years in prison and €45,000, or \$71,000 fines.

Carvajal, Doreen. **French legislators approve law against Web sites encouraging anorexia and bulimia**. New York Times, April 15, 2008.

Instagram Has an Anorexia Problem, Too

Like everywhere else on the Internet, a thinspiration community has popped up on Instagram.

REBECCA GREENFIELD

| APR 17, 2012

| TECHNOLOGY

Greenfield, Rebecca. **Instagram Has an Anorexia Problem, Too**. The Atlantic, April 17, 2012

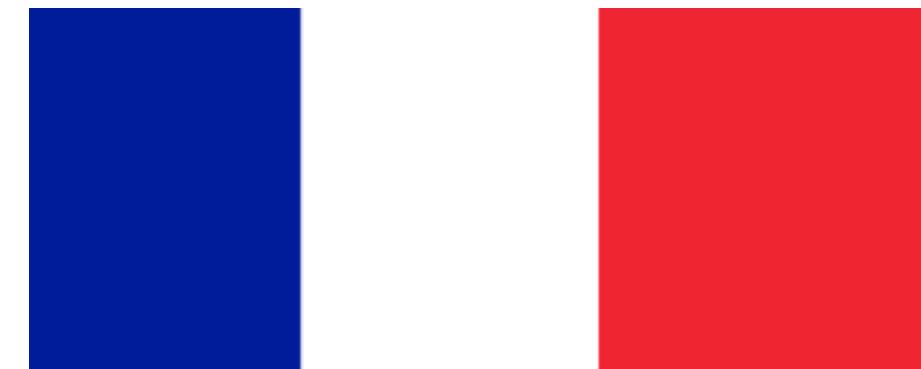
“hashtags that actively promote self-harm, such as “thinspiration,” “probulimia,” and “proanorexia,” are no longer searchable.



40

million

total users 04/2012



55

million

internet users 2012

Instagram (2012) Instagram’s New Guidelines Against Self-Harm Images & Accounts. Instagram blog, April 20, 2012.

“

Communities adopting lexical variants

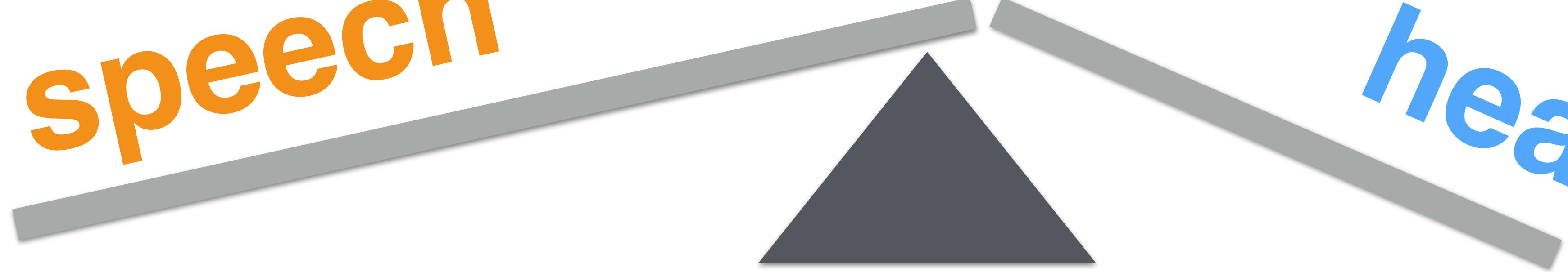
[e.g. who worked around the search ban]
were also found to show **increased social participation and engagement** compared
to those around the moderated tags



Chancellor, S., Pater, J. A., Clear, T., Gilbert, E., & De Choudhury, M. (2016). **#thyghgapp: Instagram Content Moderation and Lexical Variation in Pro-Eating Disorder Communities**. In Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing (pp. 1201–1213). ACM

**freedom
of speech**

**public
health**



freedom
of speech

public
health

**freedom of
speech**

?

**anorexia page
popularity**

?





- A **20 per cent reduction in speeding** over six months
- A **34 per cent increase in acceptances** by students from under-represented schools to top universities.
- An **8% reduction in annual household gas consumption** following installation of smart heating controls
- A **38 per cent reduction in patient referrals** to over-booked hospitals

Behavioral Insights Team. [The Behavioral Insights Team Update Report 2016-2017](#).

THE
BEHAVIORAL
INSIGHTS TEAM.

“

By encouraging a small set of students to **take a public stance against typical forms of conflict** at their school, our intervention **reduced overall levels of conflict by an estimated 30%**.

The study **demonstrates the power of peer influence** for changing climates of conflict, and suggests **which students to involve in those efforts**.

Paluck, E. L., Shepherd, H., & Aronow, P. M. (2016). **Changing climates of conflict: A social network experiment in 56 schools**. Proceedings of the National Academy of Sciences, 113(3), 566-571.

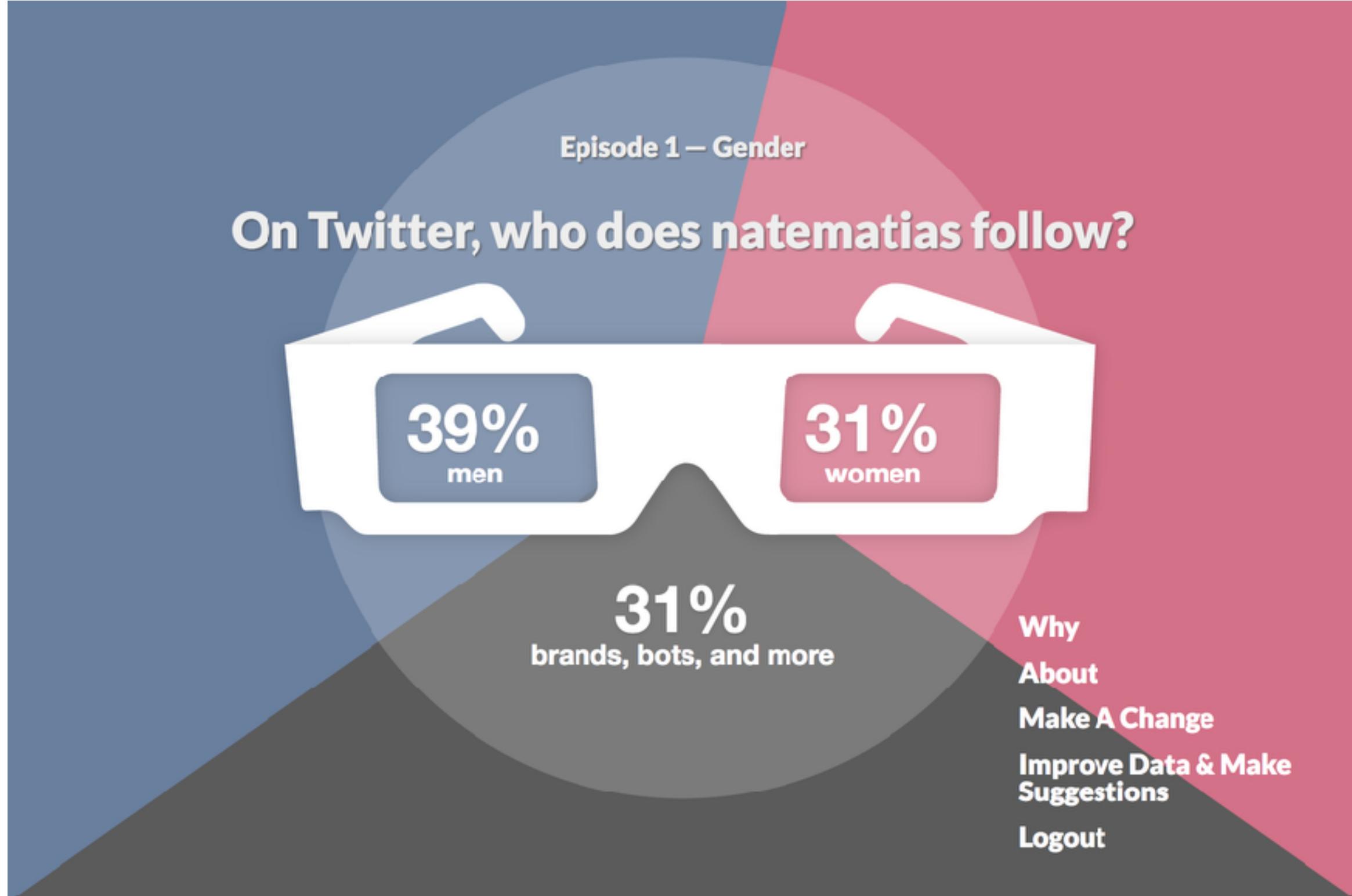
In local online classified advertisements throughout the US... **Black sellers do worse than white sellers** on a variety of market outcome measures:

- They receive 13% **fewer responses**
- 17% **fewer offers**
- Conditional on receiving at least one offer,
 - black sellers also receive 2-4% **lower offers**
 - buyers corresponding with black sellers exhibit **lower trust**:

Doleac, J. L., & Stein, L. C. (2013). *The visible hand: Race and online market outcomes*. The Economic Journal, 123(572), F469-F492.



Doleac, J. L., & Stein, L. C. (2013). *The visible hand: Race and online market outcomes*. The Economic Journal, 123(572), F469-F492.



Treatment

Placebo

Matias, J. N., Szalavitz, S., Zuckerman, E. **FollowBias: Supporting Behavior Change Toward Gender Equality by Networked Gatekeepers on Social Media**. In Proceedings of the 20th ACM Conference on Computer Supported Cooperative Work & Social Computing.

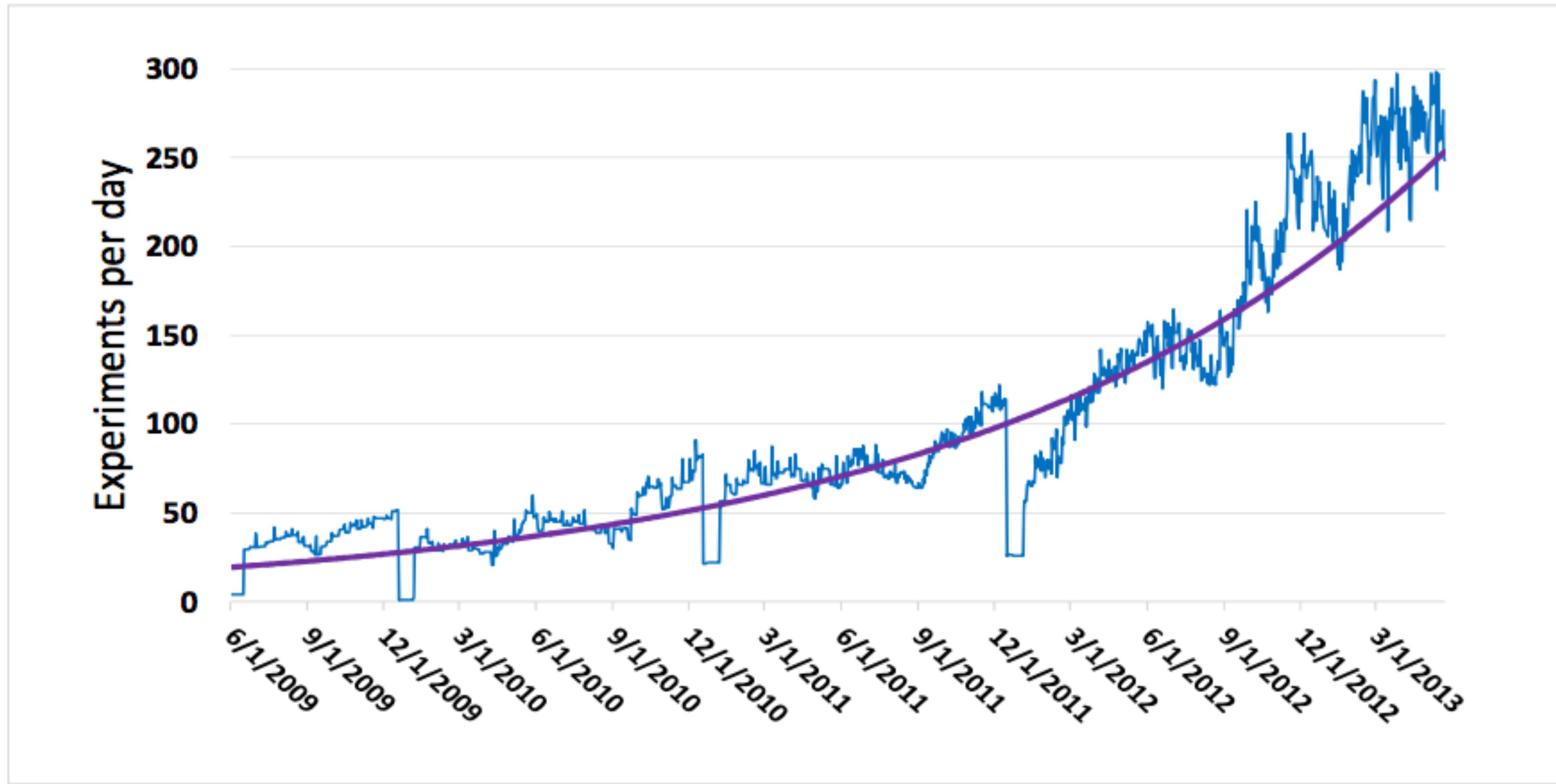
“

[in] an entire redesign of the Premium Subscription's **payment flow** ...

The experiment showed **an increase of millions of dollars in annualized bookings**, about 30% reduction in refund orders and over 10% lift in free trial orders.

Xu, Y., Chen, N., Fernandez, A., Sinno, O., and Bhasin, A. **From infrastructure to culture: A/b testing challenges in large scale social networks.** In Proceedings of the 21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, ACM (2015), 2227–2236.

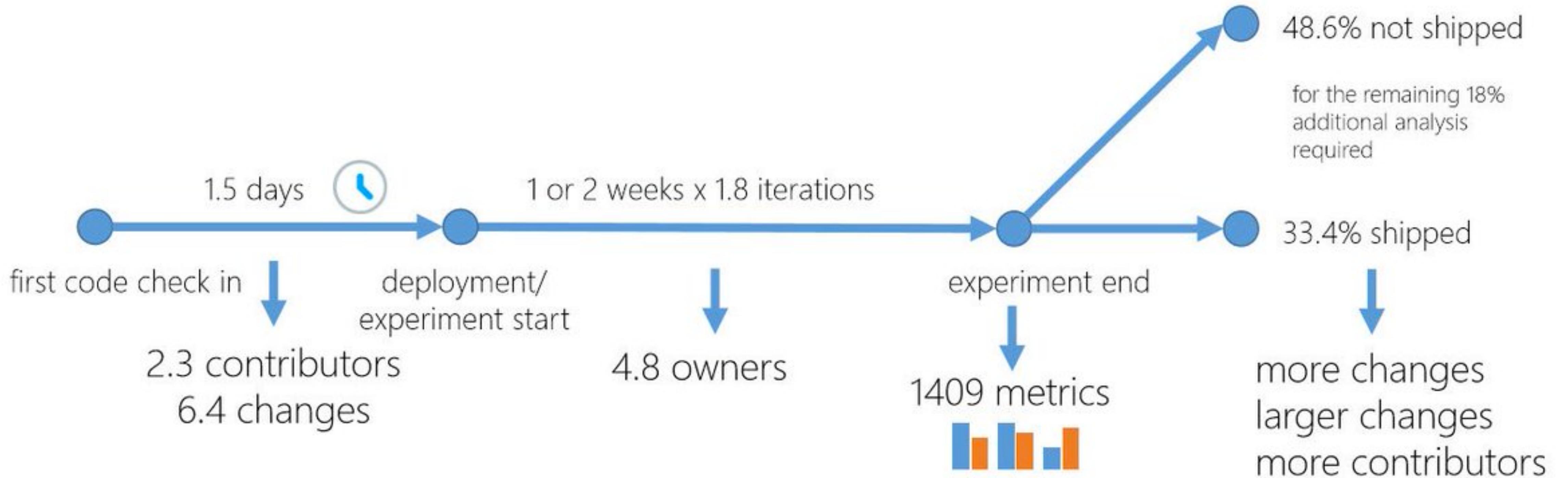




Experiments Per Day on bing.com

Kohavi, R., Deng, A., Frasca, B., Walker, T., Xu, Y., & Pohlmann, N. (2013, August). **Online controlled experiments at large scale**. In Proceedings of the 19th ACM SIGKDD international conference on Knowledge discovery and data mining (pp. 1168-1176). ACM.





Kevic, K., Murphy, B., Williams, L., & Beckmann, J. (2017, May). **Characterizing experimentation in continuous deployment: a case study on bing.** In Proceedings of the 39th International Conference on Software Engineering: Software Engineering in Practice Track (pp. 123-132). IEEE Press.



“ the number of concurrent experiments running in ERF has grown from a few dozen (in 2014) to **about 500 concurrent experiments** [May 2017]

Today we compute ~2500 distinct metrics per day and roughly **50k distinct experiment/metric combinations.**



Parks, Jonathan. [Scaling Airbnb's Experimentation Platform](#). Airbnb Engineering & Data Science. May 10, 2017.



How Uber Uses Psychological Tricks to Push Its Drivers' Buttons

The company has undertaken an extraordinary experiment in behavioral science to subtly entice an independent work force to maximize its growth.

“ Employing **hundreds of social scientists and data scientists**,

Uber has **experimented** with video game techniques, graphics and noncash rewards of little value that can **prod drivers into working longer and harder** — and sometimes at **hours** and **locations** that are **less lucrative** for them.

Scheiber, N., Huang, J. (2017) **How Uber Uses Psychological Tricks to Push Its Drivers' Buttons**. New York Times Magazine. April 2, 2017.

“ information and power asymmetries produced by the Uber application are fundamental to its ability to structure control over its workers

Rosenblat, A., & Stark, L. (2016, July). **Algorithmic Labor and Information Asymmetries: A Case Study of Uber’s Drivers** (SSRN Scholarly Paper No. ID 2686227). Rochester, NY: Social Science Research Network.



J. Nathan Matias

@natematias

civilservant.io

jmatias@princeton.edu

Department of

Psychology
PRINCETON
UNIVERSITY



CITP



mit
media
lab

J. NATHAN MATIAS

Connect 

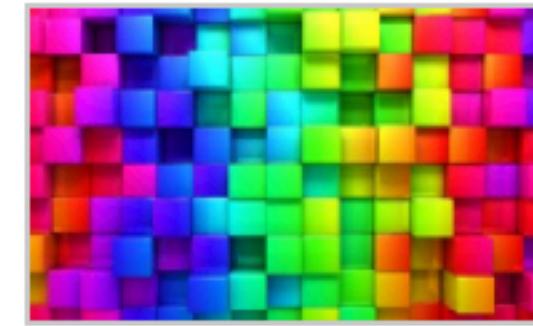
J. Nathan Matias researches technology for cooperation and civic life at the MIT Media Lab and Center for Civic Media. He also facilitated @1book140, *The Atlantic's* Twitter book club from 2012 – 2014.



Who Gets to Use Facebook's Rainbow 'Pride' Reaction?

An analysis to see if the algorithms behind the new emoji contribute to political bubbles in America

J. NATHAN MATIAS, AIMEE RICKMAN, AND MEGAN STEINER JUN 26, 2017



Were All Those Rainbow Profile Photos Another Facebook Study?

The social network learns more about its users than they might realize.

J. NATHAN MATIAS JUN 28, 2015



The Tragedy of the Digital Commons

Advocates for fairer, safer online spaces are turning to the conservation movement for inspiration.

J. NATHAN MATIAS JUN 8, 2015



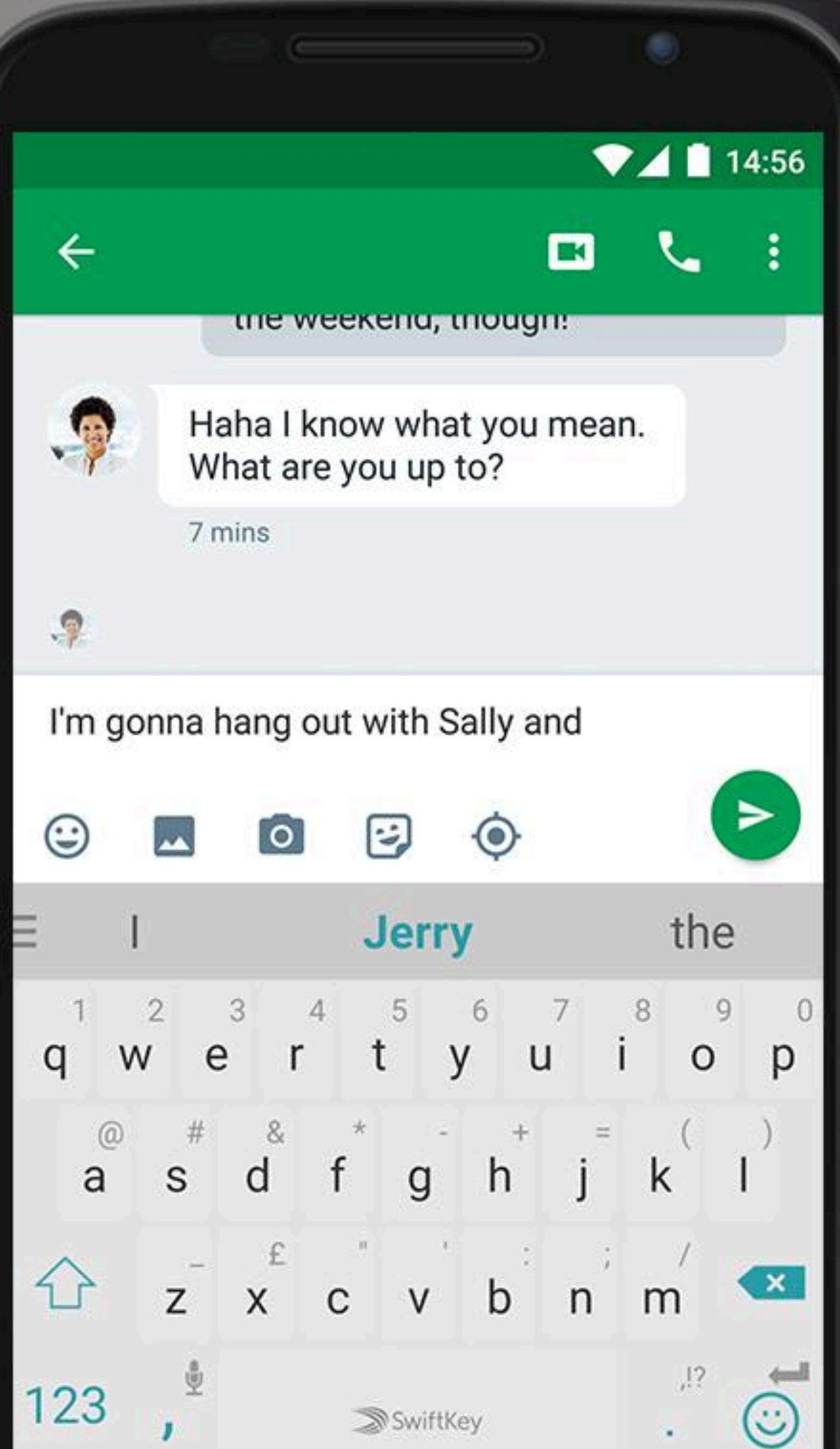
Coming Up: A Live Twitter Chat With 1book140 Author Alison Bechdel

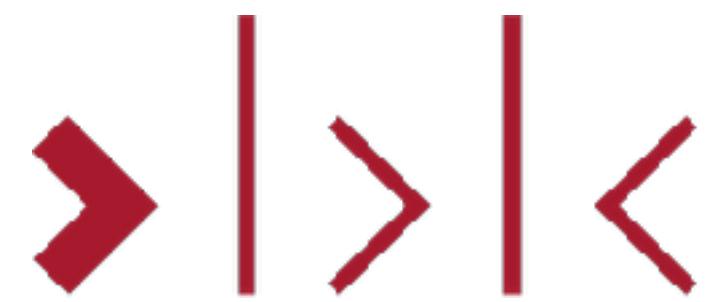
The creator of *Fun Home* will take reader questions on Monday at 7 p.m. Eastern.

J. NATHAN MATIAS OCT 16, 2014

Personal predictions

SwiftKey intelligently learns from your unique writing style to predict your next word.





**BERKMAN
KLEIN CENTER**
FOR INTERNET & SOCIETY
AT HARVARD UNIVERSITY

Week 1: Introducing SOC 412: Designing Field Experiments at Scale



CivilServant

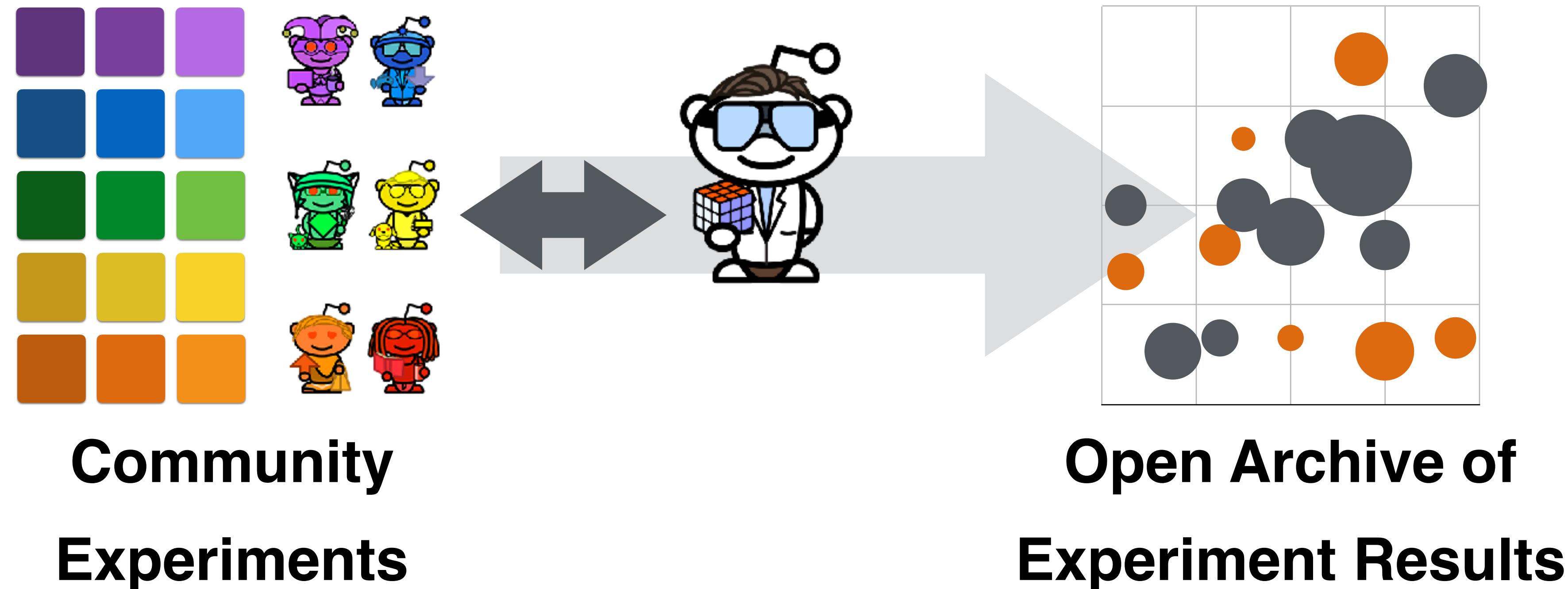
**Citizen Behavioral Science for a
fairer, safer, more understanding internet**

civilservant.io

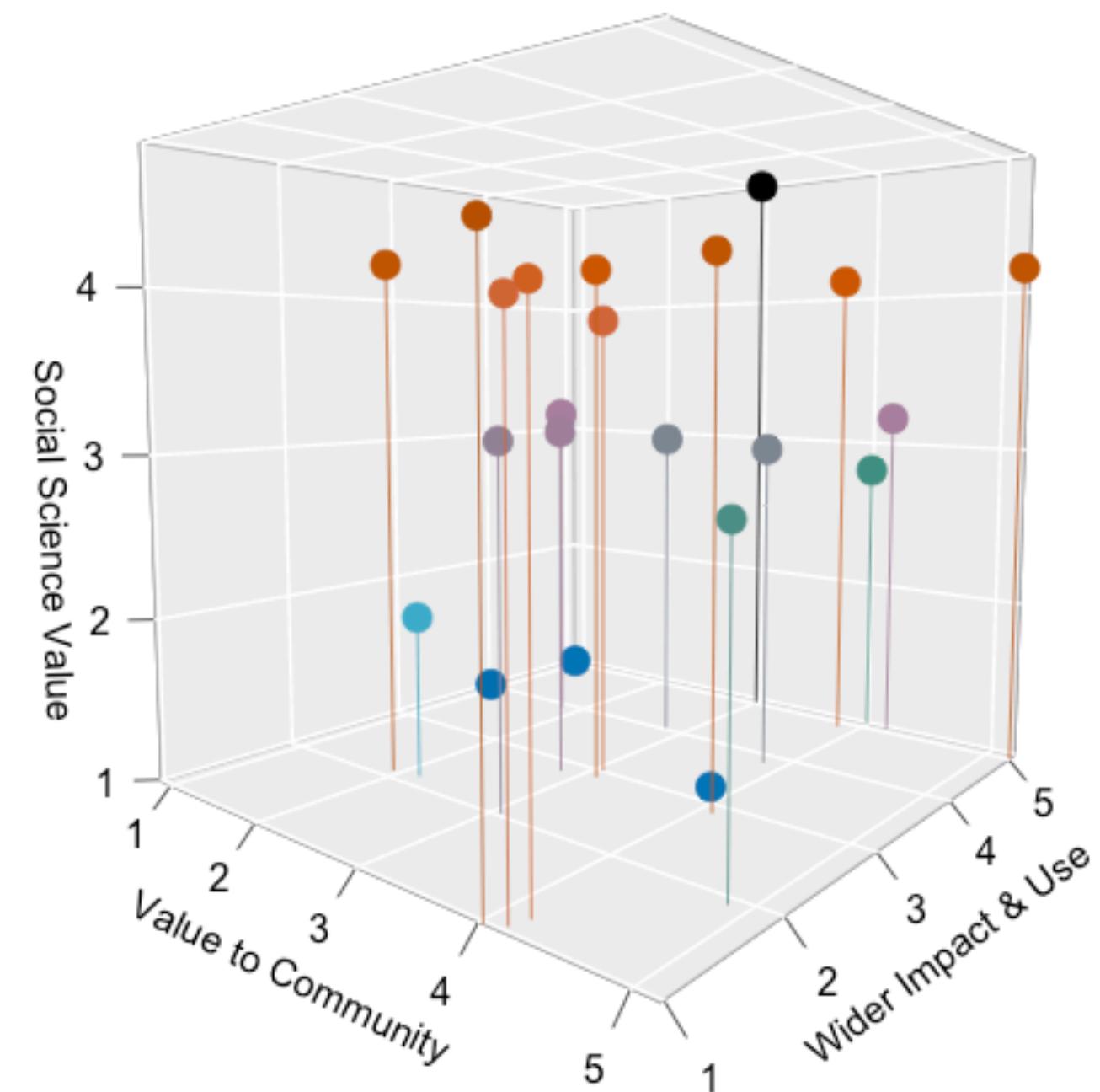
 Global Voices

Civil Servant

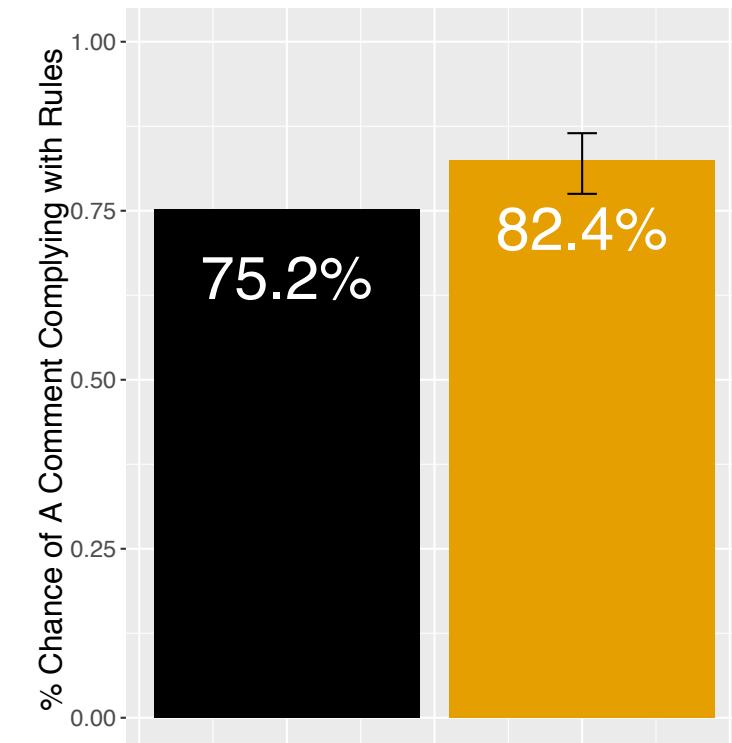
Community-Led Field Experiments in
Governing Human & Machine Behavior



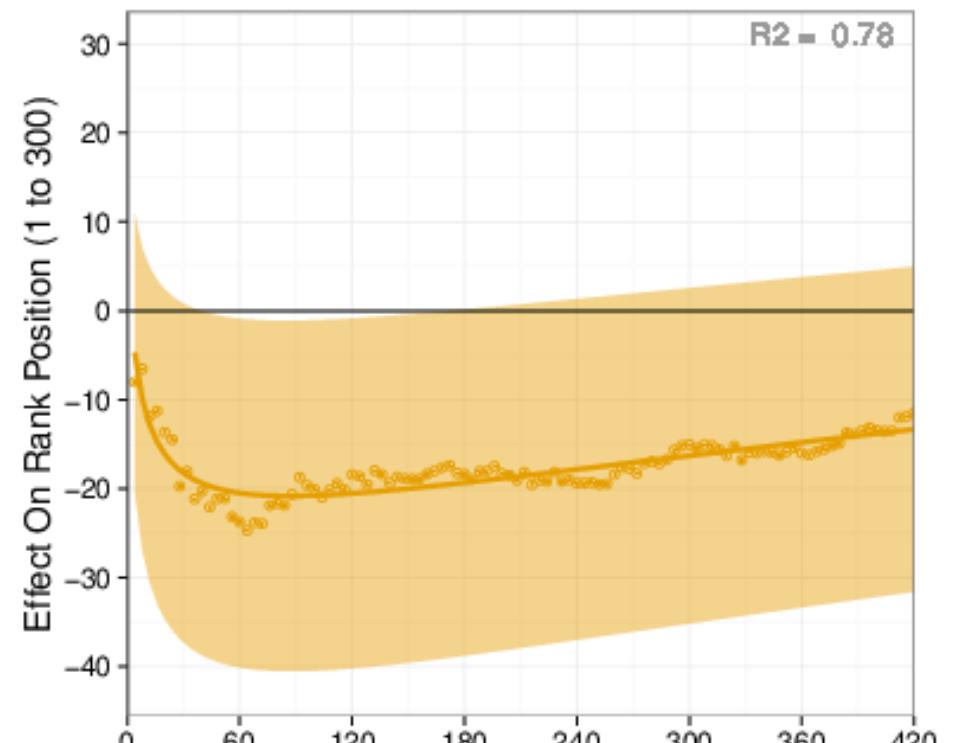
Studies proposed at the CivilServant Research Summit



Source: J. Nathan Matias, CivilServant.io. n=22 research proposed by moderators of 60 online communities, along with social scientists and computer scientists at the MIT Media Lab on Jan 28, 2018. If studies are replicated at the estimated rate, this research agenda could result in 155 new studies. Studies include research on online harassment, restorative justice, fact-checking, mental health, moderator training, community engagement, and platform compliance with their own policies. Ratings are based on a preliminary analysis of proposals generated at the summit.



Preventing Harassment



Limiting Misinformation



Managing Conflict



Banning Accounts



Responding to Harassment



Auditing Algorithms



Auditing AI Law Enforcement



Accountability & Ethics



Checkbox image CC-by-2.0 by Weltenraser on The Noun project



THE
BEHAVIORAL
INSIGHTS TEAM.



Science



**Design, Conduct,
Interpret Field
Experiments**

Design
Experiments &
Replications at
Scale

**Read, Interpret,
and Plan**
Replications of
Other Research

Write & Critique
an Article
Reporting
Experiment
Results

Understand what
Experiments Bring
to **Policy**, Social
Science &
Business

Participate in
Debates on **Ethics**
and **Politics** of
Experiments

February

Part I: Understanding Field Experiments

- Experience running 1+ experiments
- Experience analyzing experiment results

March into April

Part II: Planning Your Field Experiment

- Experiment Plan
- Community Relationship

April - May

Part III: Deploying & Reporting Your Field Experiment

- Initial Results
- Initial Analysis
- Paper Draft (gradstudents)
- May 7 Final Presentations & Feedback

What to Expect Each Week (more or less)

- Major analysis/writing assignment (**pairs**)
- Progress on an experiment (**pairs**)
- Readings & reflection (**individual**)

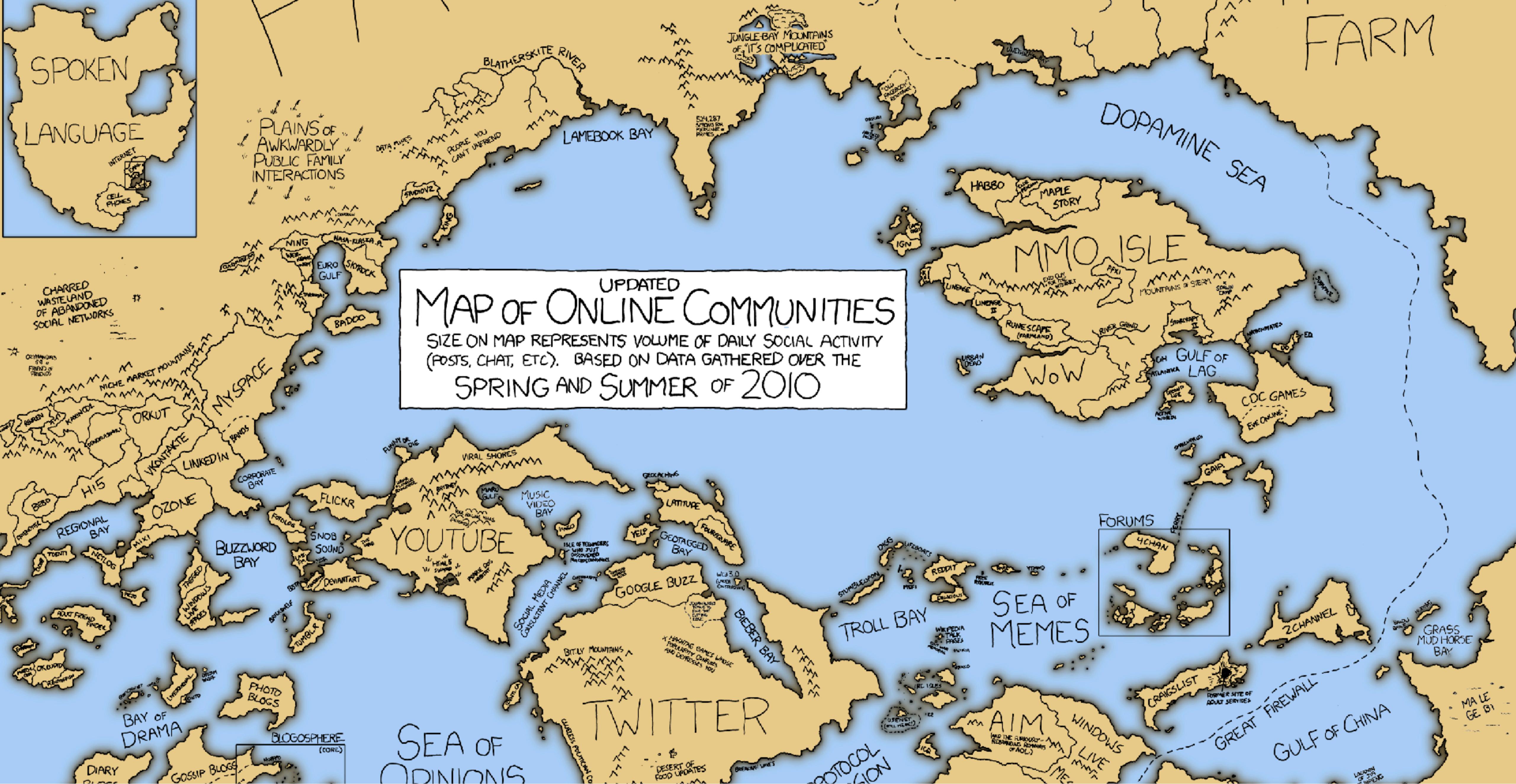
Monday: Discussion of Issues/Context

- Discuss last week's assignment
- Discuss context readings (presentation in **pairs**)
- Discuss an example experiment (presentation in **pairs**)

Wednesday: Research Methods & Discuss Assignment

Grading Rubric

- **Class Participation (20%)**
 - Did you attend?
 - Did you speak in class?
 - Did you add meaningfully to the conversation?
- **Weekly Assignments (20%)**
 - Split among Implementation, Analysis, and Writing
- **Midterm Experiment Design (20%)**
- **Final Project (40%)**

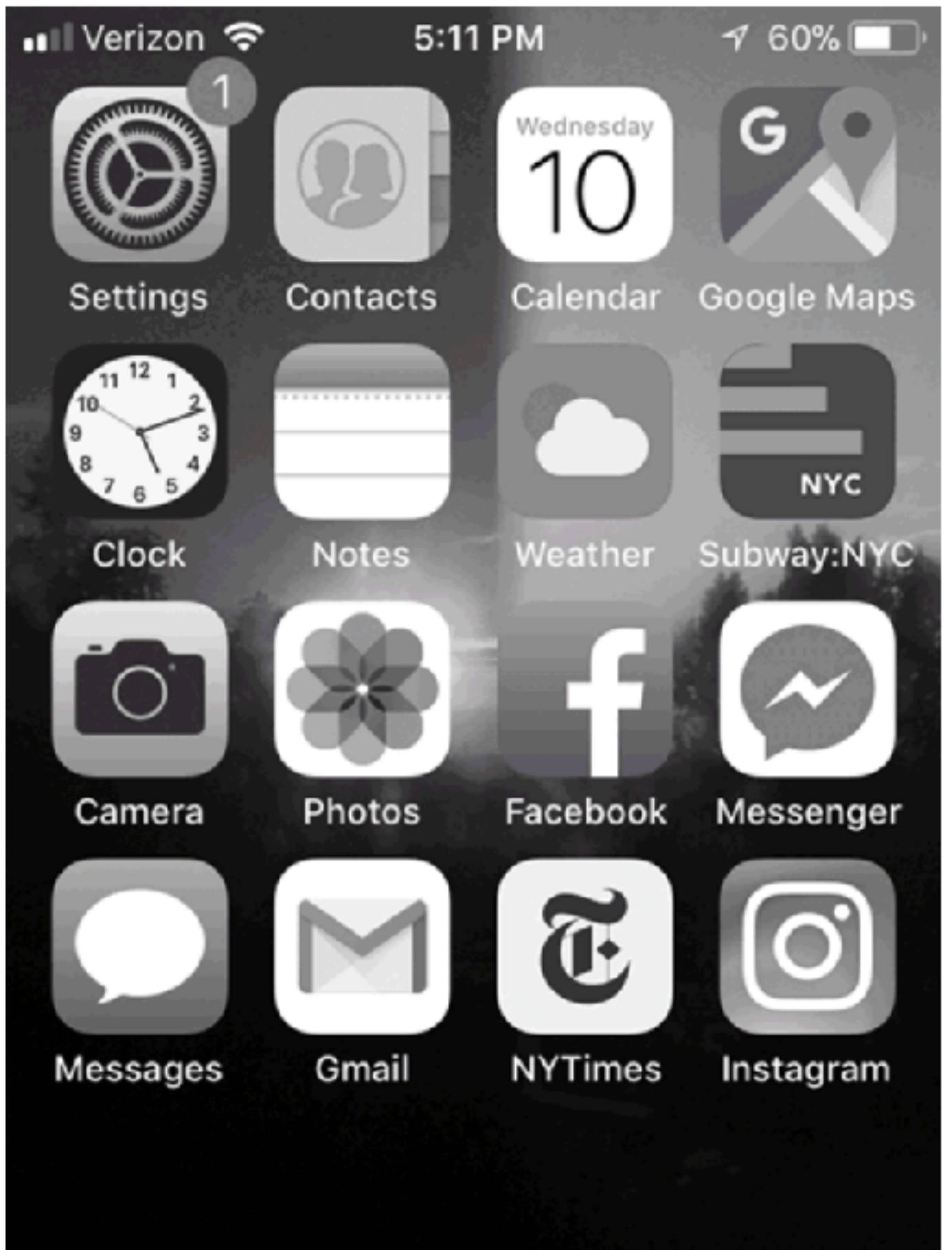


Is the Answer to Phone Addiction a Worse Phone?

[查看简体中文版](#) | [查看繁體中文版](#) | [Leer en español](#)

Disruptions

By NELLIE BOWLES JAN. 12, 2018



SAN FRANCISCO — I've gone gray, and it's great.

In an effort to break my smartphone addiction, I've joined a small group of people turning their phone screens to grayscale — cutting out the colors and going with a range of shades from white to black. First popularized by the tech ethicist Tristan Harris, the goal of sticking to shades of gray is to make the glittering screen a little less stimulating.

I've been gray for a couple days, and it's remarkable how well it has eased my twitchy phone checking, suggesting that one way to break phone attachment may be to,

Weekend magazine technology special

'Our minds can be hijacked': the tech insiders who fear a smartphone dystopia

Google, Twitter and Facebook workers who helped make technology so addictive are disconnecting themselves from the internet. **Paul Lewis** reports on the Silicon Valley refuseniks alarmed by a race for human attention

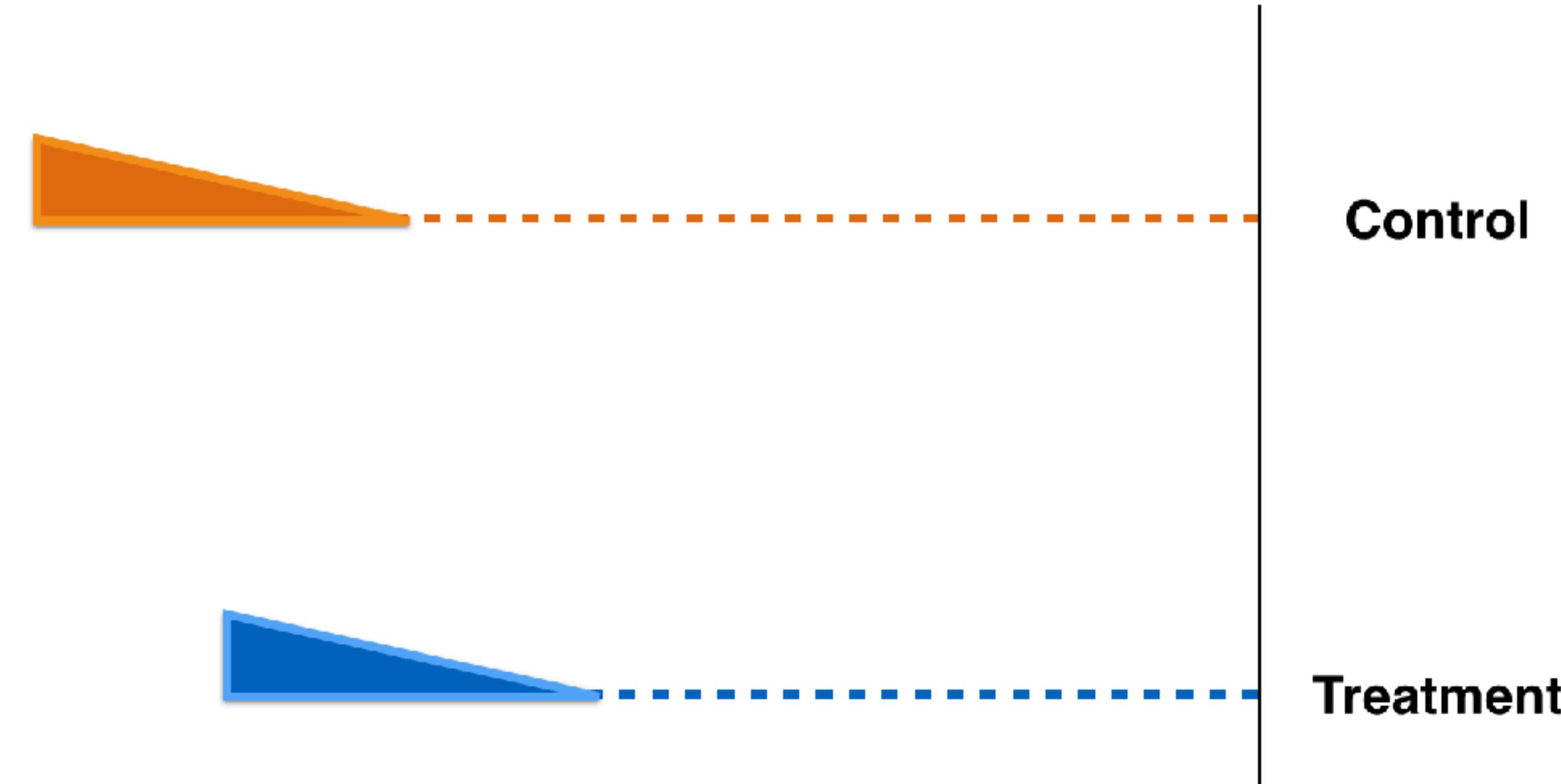
by [Paul Lewis](#) in San Francisco



Gray Phone Challenge



The Cornhole Experiment



**Science**

Conservatives and liberals united only by interest in dinosaurs, study shows

Can an interest in science unite a divided society? No, concludes research based on reading habits of those from right and left of the political spectrum



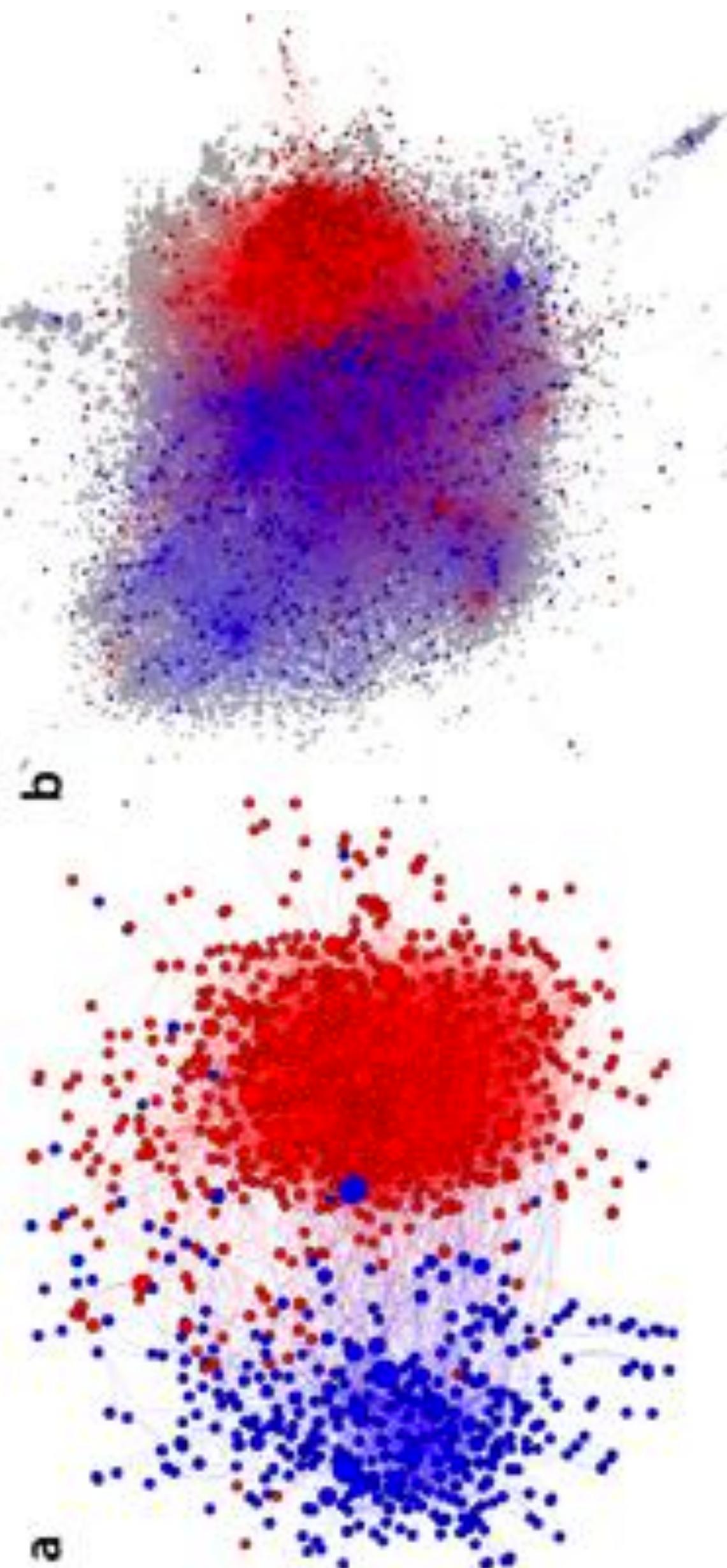
Ian Sample Science editor

@iansample

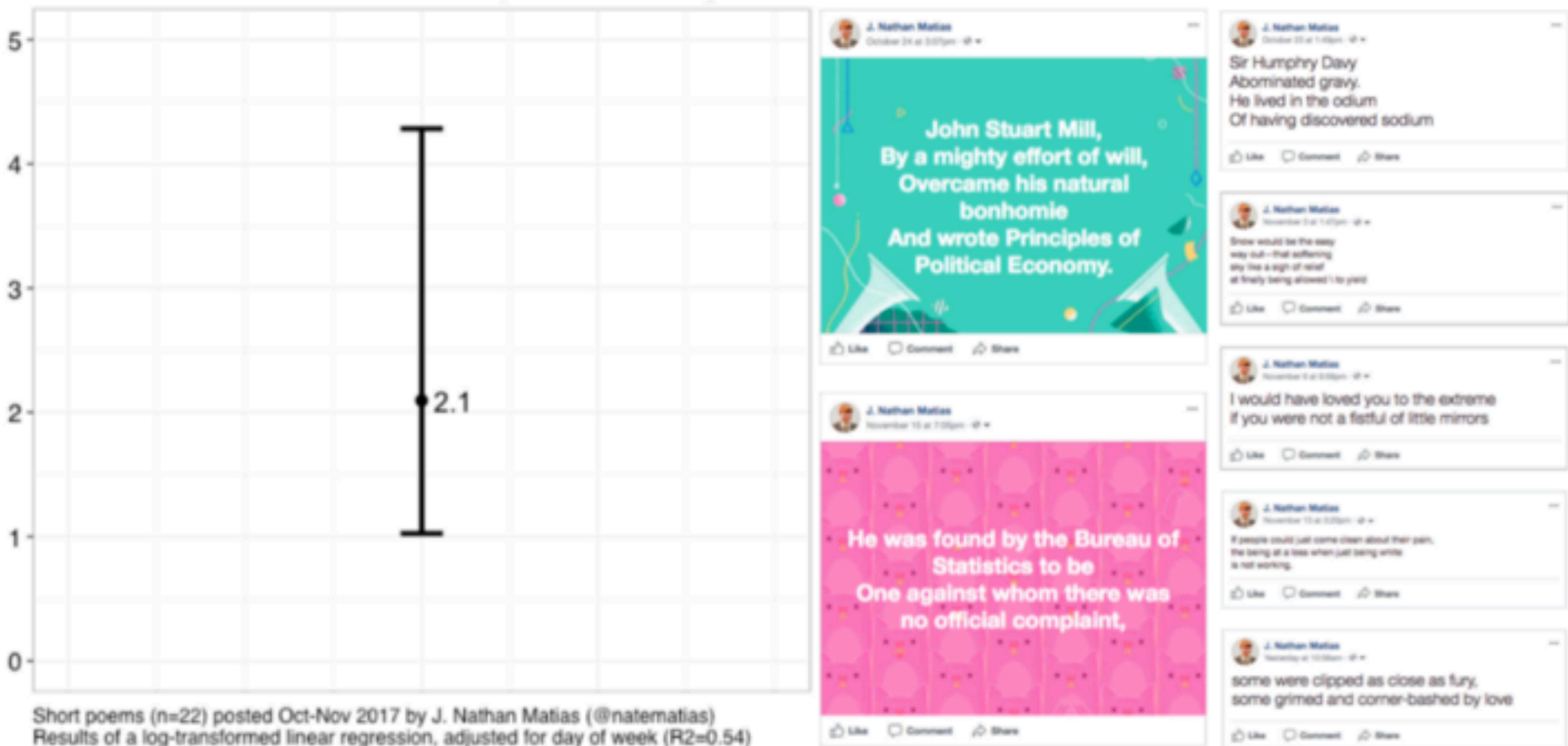
Mon 3 Apr 2017 11.04 EDT

science

politics



Using Facebook's **color backgrounds** on **poems** increases the rate of **likes** & **comments** by **2.1x**



Final Project

The final project will involve designing, conducting, and analyzing early results from a field experiment, writing for a policy audience.

Graduate students will be expected to write up the field experiment for a policy audience, and also for academic publication.

The final can be a project of your own, or you can choose from an upcoming CivilServant study.

Upcoming CivilServant Experiments

- Growing understanding through evidence & expertise (fact-checking, etc)
- Peer support & online moderation
- Protecting the vulnerable online
- Growing healthy conversations online
- Making AI law enforcement more humane
- Behavior change among people who engage in harassing behaviors

Speaker Series?

- Facebook Core Data Science Team
-?

Office Hours

Monday, 10am - 11am (15 & 30 minutes)

Wednesday, 10am - 11am (15 & 30 minutes)

<https://meetme.so/natematias>

(coming soon)

IRB Training

Essential. If you do not have CITI certification for Human Subjects Research, please take this course ASAP, as your participation in the class will depend on this. It may take 4-6 hours.

“Social and Behavioral Researchers”

<https://www.princeton.edu/ria/>

Getting Further Support

- **Statistics Support**
 - Data & Statistical Services (dss.princeton.edu)
 - Center for Statistics & Machine Learning
(csml.princeton.edu)
- **Writing Support**
 - Princeton Writing Center
(writing.princeton.edu/center)

Next Steps

- Complete the Survey at: <http://bit.ly/2EhOcWg>
- Read Shadish, Cook, and Campbell
- Find an initial partner (you can post on Blackboard)
- Download assignment data:
<https://github.com/natematias/SOC412/>
- Graduate Students: Read Salganik & Watts
- If necessary, complete Princeton IRB training
- Ask friends to join the class!