



Introduction to SICSS

Munich Summer Institute in Computational Social Science

Carsten Schwemmer

What is Computational Social Science (CSS) ?

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„Anything that's cool“

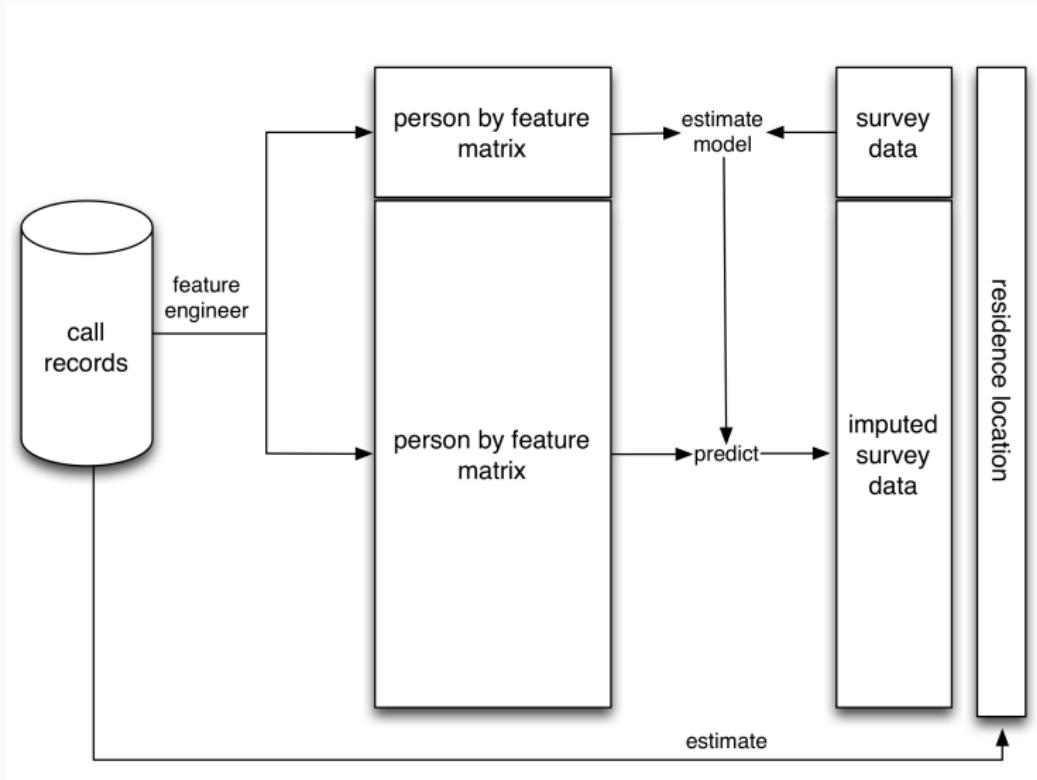
Matthew Salganik, Princeton University, SICSS Co-Founder and author
of *Bit By Bit: Social Research in the Digital Age*

Predicting poverty and wealth from mobile phone metadata

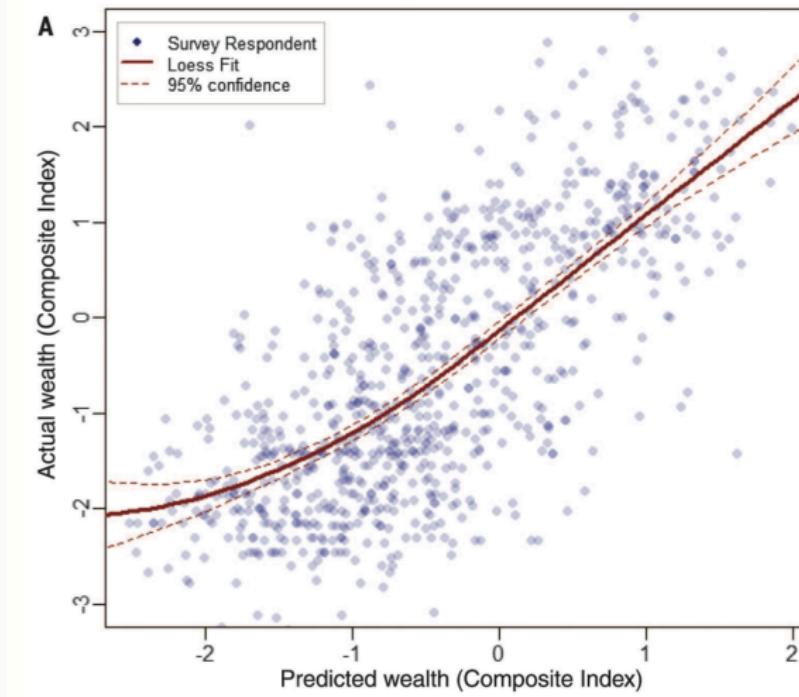
Joshua Blumenstock,^{1*} Gabriel Cadamuro,² Robert On³

Blumenstock, J., Cadamuro, G., & On, R. (2015). Predicting poverty and wealth from mobile phone metadata. *Science*, 350(6264), 1073-1076.

CSS - Research Example: Methods

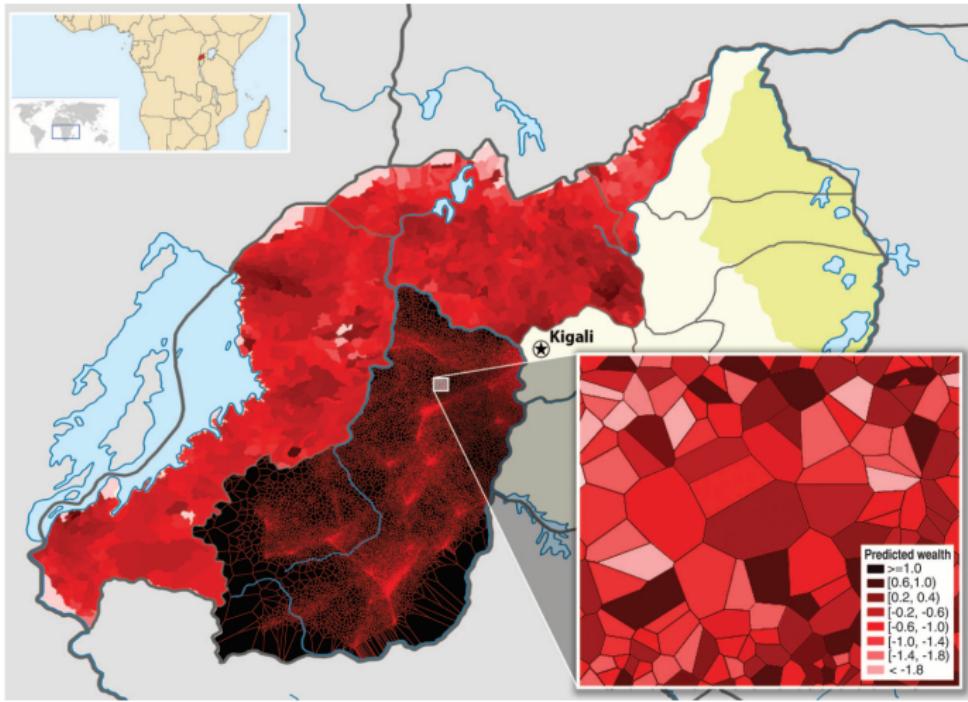


CSS - Research Example: Internal Validation



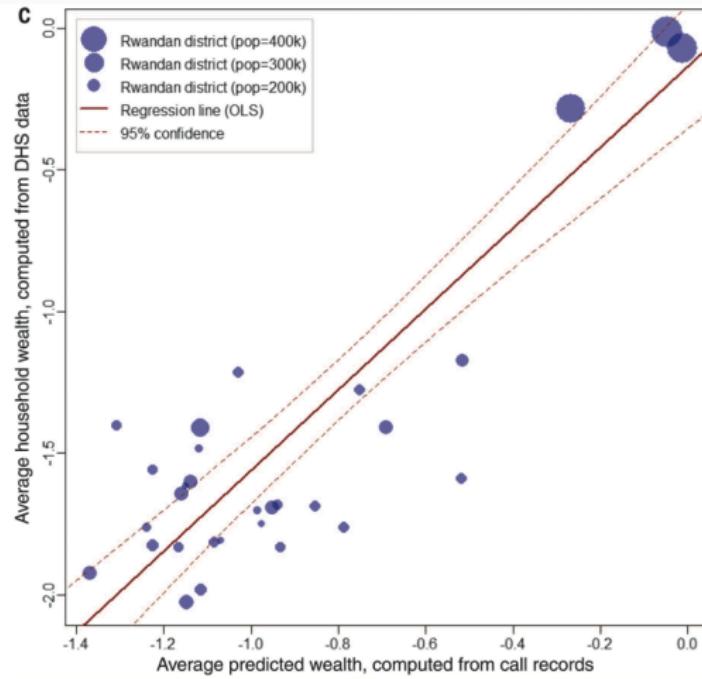
Blumenstock, J., Cadamuro, G., & On, R. (2015).

CSS Research Example: Application



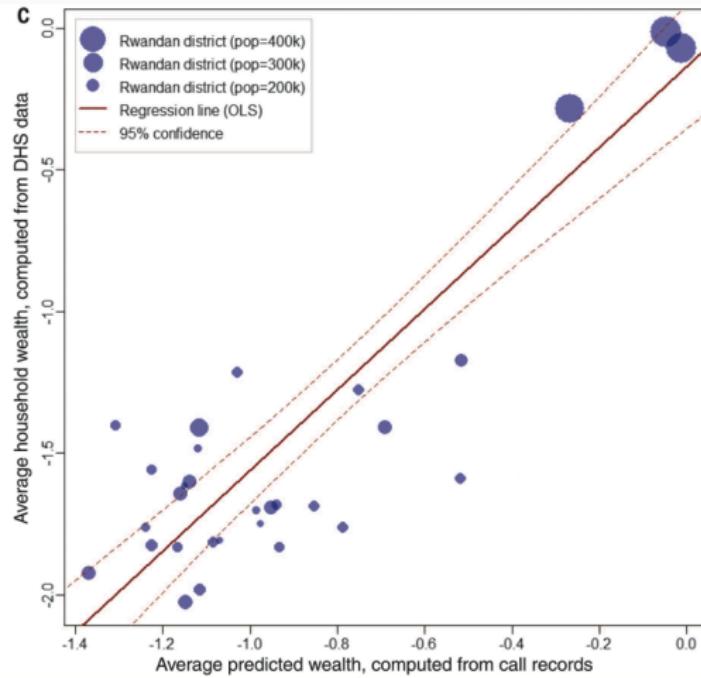
Blumenstock, J., Cadamuro, G., & On, R. (2015).

CSS Research Example: External Validation



Blumenstock, J., Cadamuro, G., & On, R. (2015).

CSS Research Example: External Validation



Blumenstock, J., Cadamuro, G., & On, R. (2015).

10 times faster, 50 times cheaper

CSS - important aspects

- *Computational Sciences & Social Sciences*
- often involves ethical/privacy questions that are now considered complex
- involves several key communities: social science, data science, business people, privacy advocates, policy makers
- combining multiple data sources: „readymades“ & „custommades“

CSS - Readymades versus Custommades



readymades



custommades

https://commons.wikimedia.org/wiki/File:Duchamp_Fountaine.jpg

https://commons.wikimedia.org/wiki/File:%27David%27_by_Michelangelo_JBU0001.JPG

CSS - Interdisciplinary Differences

“I don’t get it. Why is that research?”

	Computer Sciences	Social Sciences
Topics:	study anything	study social things
Drive:	methods driven	question driven
Data:	large found data	small designed data
Goal:	prediction	explanation

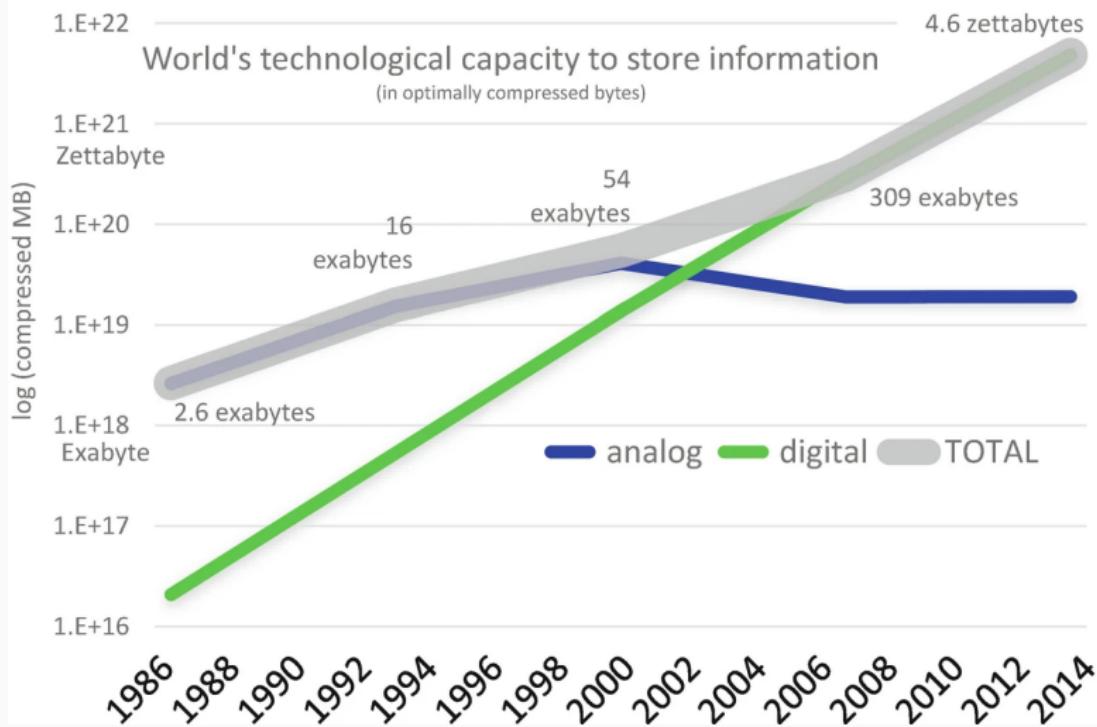
Hannah Wallach, 32nd International Conference on Machine Learning, 2015.
http://videolectures.net/icml2015_wallach_social_science/

Isn't CSS just a fad?

Isn't CSS just a fad?

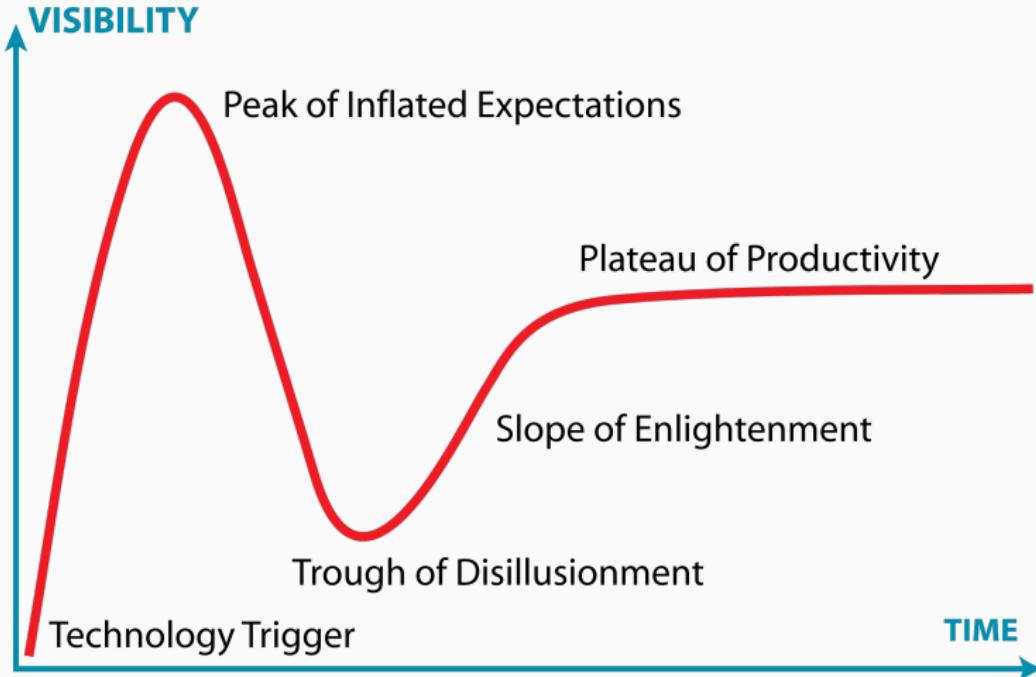
No

Information Storage Capacity Increases Rapidly



Hilbert, M. (2022). Information Quantity. In: Schintler, L.A., McNeely, C.L. (eds) Encyclopedia of Big Data.

Goal for CSS: Plateau of Productivity



Gartner Hype Cycle

https://commons.wikimedia.org/wiki/File:Gartner_Hype_Cycle.svg

Why SICSS?

Societal Issues in the Digital Age

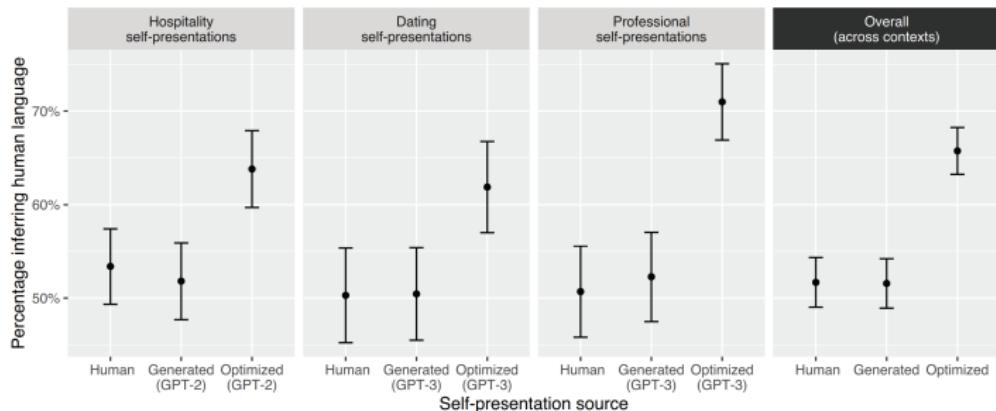
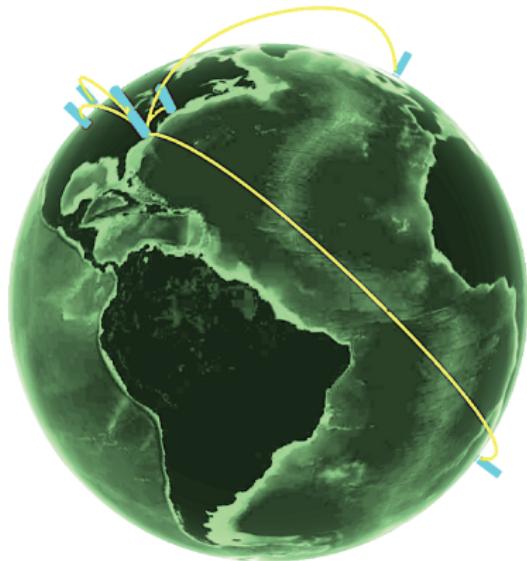


Fig. 2. The three validation experiments show that AI systems can exploit humans' flawed heuristics to generate optimized self-presentations (rightmost in each pane) more likely to be perceived as human than human-written self-presentations (leftmost) and regular AI-generated profiles (center). Error bars represent 95% CIs for 350 to 450 judgments of 100 self-presentations per bar.

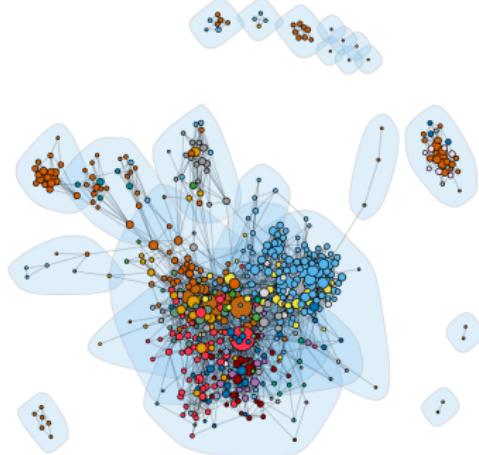
Jakesch, M., Hancock, J. T., & Naaman, M. (2023). Human heuristics for AI-generated language are flawed. *Proceedings of the National Academy of Sciences*, 120(11).

SICSS as a Means to Provide Solutions

SICSS



Our Field is Interdisciplinary



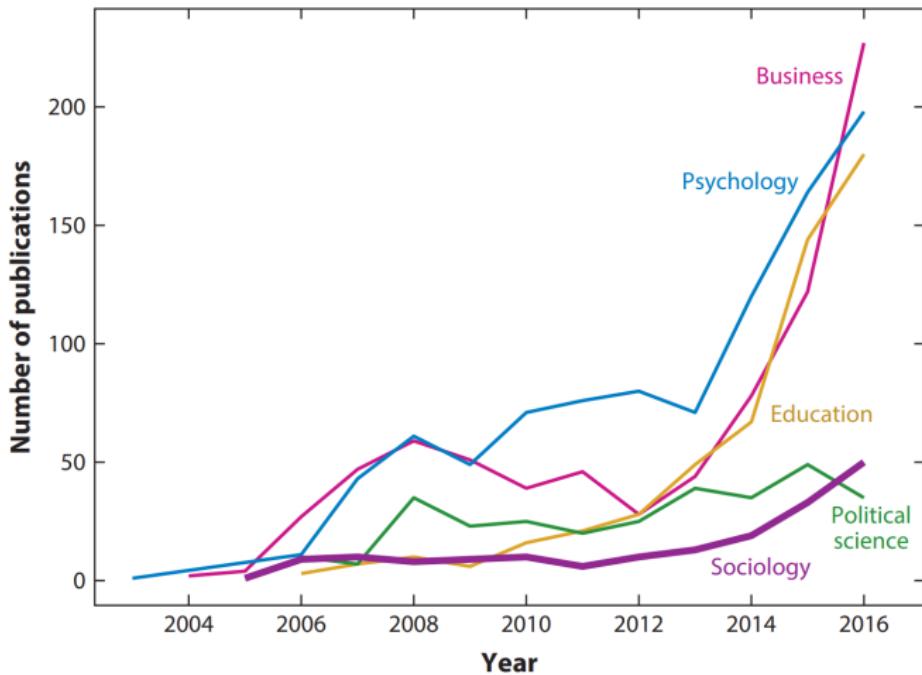
COMPUTATIONAL SOCIAL SCIENCE AS A NETWORK

Nodes colored by first-listed discipline



Edelman, A., Wolff, T., Montagne, D., & Bail, C. A. (2020). Computational Social Science. Annual Review of Sociology, 46

Our Field is Growing



Edelman, A., Wolff, T., Montagne, D., & Bail, C. A. (2020). Computational Social Science. Annual Review of Sociology, 46

Goal 1: Provide State-of-the-Art Training

```
<ul><a href="index.html">Home</a></ul>
<ul><a href="home-events.html">Home Events</a></ul>
<li class="has-children"> <a href="#" class="current">Header Options</a>
    <ul>
        <li><a href="tall-button-header.html">Tall Button Header</a></li>
        <li><a href="image-logo.html">Image Logo</a></li>
        <li class="active"><a href="tall-logo.html">Tall Logo Images</a>
        </li>
    </ul>
<li class="has-children"> <a href="#">Carousels</a>
    <ul>
        <li><a href="variable-width-slider.html">Variable Image Wi</a>
        <li><a href="testimonial-slider.html">Testimonial Slider</a>
        <li><a href="featured-work-slider.html">Featured Work Slid</a>
        <li><a href="equal-column-slider.html">Equal Column Slid</a>
        <li><a href="video-slider.html">Video Sliders</a></li>
        <li><a href="mini-bootstrap-carousel.html">Mini Slider</a>
    </ul>
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Goal 2: Challenge Disciplinary Divides

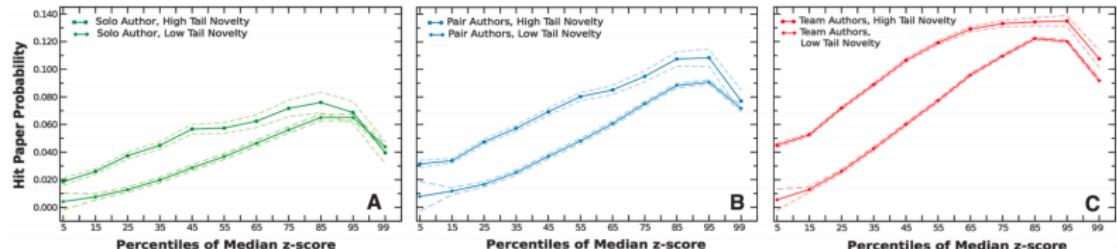


Fig. 4. Novel and conventional combinations in the production of science. (A to C) The interplay between tail novelty, median conventionality, and hit paper probabilities shows remarkable empirical regularities. First, high tail novelty papers have higher impact than low tail novelty papers at (i) any level of conventionality and (ii) regardless of authorship structure. Second, increasing median conventionality is associated with higher impact up to the

85th to 95th percentile of median conventionality, after which the relationship reverses. Third, larger teams obtain higher impact given the right mix of tail novelty and median conventionality. Nonetheless, at low levels of median convention and tail novelty, even teams have low impact, further emphasizing the fundamental relationship between novelty, conventionality, and impact in science.

Mukherjee, S. et al. (2017). How atypical combinations of scientific ideas are related to impact: The general case and the case of the field of geography. *Knowledge and networks*, 243-267.

Goal 3: Reach a Broad Audience



<https://sicss.io/locations>

Goal 4: Open-Source



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[Pre-arrival](#)

[People](#)

[Schedule & Materials](#)

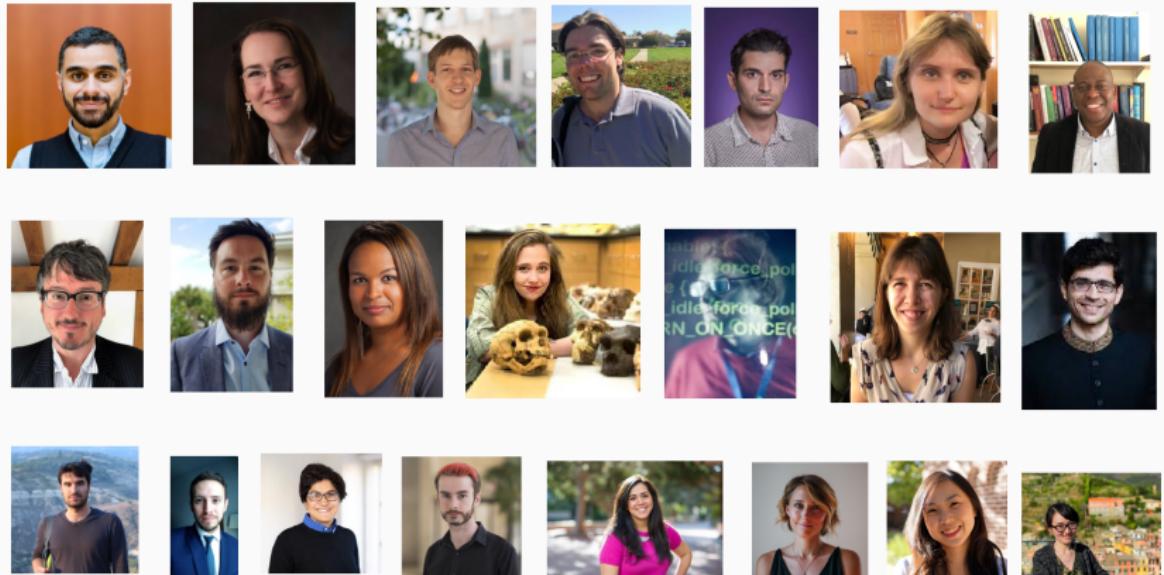
[Apply](#)

Other Events:



<https://github.com/compsocialscience/summer-institute>

Goal 5: Teach the Teachers



Goal 6: Create a Diverse Community



See also related initiatives such as <https://varycss.org/>

How SICSS works

Schedule

Morning	Lectures by Matt/Chris/Site Leaders	Research Speed Dating	Group Research Projects	
Afternoon	Group Exercises			Presentations
Week #1		Week #2		
Lunch/ Dinner	Lectures by Guest Speakers (or Informal Socialization Activities)			

Lectures

Day	Topic	Lecturer
Monday	Intro/Ethics	Carsten & Mario
Tuesday	Collecting Digital Trace Data	Jan Zilinsky
Wednesday	Basics of Automated Text Analysis	Carsten
Thursday	Advanced Automated Text Analysis	Valerie Hase
Friday	Surveys in the Digital Age	Bernhard v. Hohenberg
Saturday	Transparent & Reproducible Research	Alexander

Accessing materials

Go to this site:

<https://sicss.io/2023/munich/schedule>

In addition, feel free to use our Slack channel for sharing additional materials, interesting studies, etc.

Guest Speakers

Day	Speaker
Monday (week 1)	Frauke Kreuter
Tuesday (week 1)	Raphael Heiberger
Wednesday (week 1)	Jürgen Pfeffer
Thursday (week 1)	Stefanie Walter
Friday (week 1)	Agnes Horvart
Monday (week 2)	Andreas Jungherr
Tuesday (week 2)	Franziska Weeber

Titles & abstracts of guest talks:

[https://github.com/compsocialscience/summer-institute/
blob/master/_data/2023/munich/guest_talks_details.md](https://github.com/compsocialscience/summer-institute/blob/master/_data/2023/munich/guest_talks_details.md)

Group Projects



The wisdom of partisan crowds

Joshua Becker^{a,*}, Ethan Porter^b, and Damon Corrao^c

^aWharton School of Communication, University of Pennsylvania, Philadelphia, PA 19104; ^bWharton School of Management, Northwestern University, Evanston, IL 60201; ^cDepartment of Psychology, University of Pennsylvania, Philadelphia, PA 19104; and ^dDepartment of Civil and Environmental Engineering, University of Pennsylvania, Philadelphia, PA 19104

DOI: 10.1073/pnas.1718002115 | Published December 1, 2017 | Article information

ABSTRACT In a series of behavioral experiments, we found that people's political beliefs are shaped by their social network. While research on the "wisdom of crowds" has found that groups make better decisions than individuals, these studies have focused on groups that are randomly selected and have no preexisting beliefs. In contrast, we find that groups with like-minded members are more accurate—indeed, more polarized—than groups with diverse members. This suggests that partisan groups are more effective than random groups at spreading political beliefs. We also find that people's beliefs are associated not only with more conservative or liberal political attitudes, but also with more extreme attitudes toward social issues. Within bipartisan networks containing both Democrats and Republicans, we find that individuals are more likely to support policies that align with their party. In addition, within partisan networks, individuals are more likely to support policies that align with their party. Our results help generalize the wisdom of crowds to the political domain.

Author contributions: J.B. and E.P. designed and conducted the experiments; J.B. and D.C. analyzed the data; and all authors contributed to writing the manuscript.

Abbreviations: *influence* = polarization + influence / (the median of crowd) + derivative democracy

PNAS

Empirica

Easy Multiplayer Interactive Experiments in the Browser

GETTING STARTED

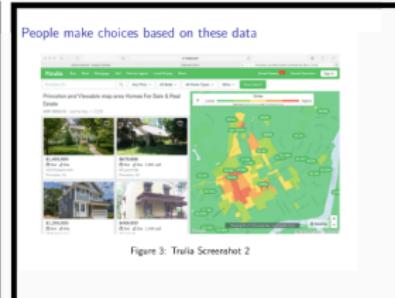
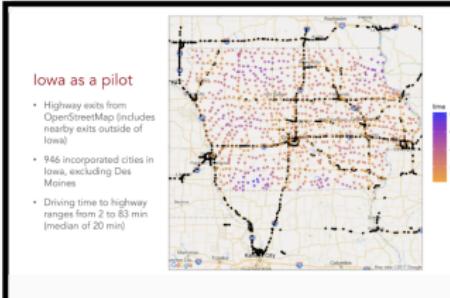


Figure 3: Trulia Screenshot 2

Your Responsibilities

- openness
- patience
- togetherness
- generosity

Feedback

General SICSS feedback form shared among partner institutes
(helps to secure funding for future events)

<https://forms.gle/XLcXdGUzwwpY9uC17>

We will also have feedback forms specific to SICSS Munich
(keep / start / stop):

<https://forms.gle/eMfyv3QreWoNPFrS9>

In the first week, this feedback will be collected at the end of each day & jointly discussed at the beginning of the next day.

Your Questions

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