Organizing a Biomedical Research Reproducibility Workshop Series

Ariel Deardorff, Data Services Librarian
University of California, San Francisco Library

UCSF Library

Why teach a series on reproducibility?

The requirement:

Advanced Notice of Coming Requirements for Formal Instruction in Rigorous Experimental Design and Transparency to Enhance Reproducibility: NIH and AHRQ Institutional Training Grants, Institutional Career Development Awards, and Individual Fellowships

Notice Number: NOT-OD-16-034

Key Dates

Release Date: December 17, 2015

The inspiration:

The catalyst:

Perspective | Open Access | Published: 10 January 2017

A manifesto for reproducible science

Marcus R. Munafò, Brian A. Nosek, Dorothy V. M. Bishop, Katherine S. Button, Christopher D. Chambers, Nathalie Percie du Sert, Uri Simonsohn, Eric-Jan Wagenmakers, Jennifer J. Ware & John P. A. Ioannidis

Nature Human Behaviour **1**, Article number: 0021 (2017) | Download Citation

About the Workshops

- Partnership between the UCSF Library, Graduate Division, and Open Science Group
- 8-part workshop series on Reproducibility for Biomedical Researchers
- Primary audience: graduate students and postdocs needing NIH reproducibility training
- Secondary audience: everyone at UCSF

What topics did we cover?

NIH GRANTS & FUNDING
NIH Central Resource for Grants and Funding Information

Search this Site
eRA | NIH Staff

OME | ABOUT GRANTS | FUNDING | POLICY & COMPLIANCE | NEWS & EVENTS

Home » Policy & Compliance » Rigor and Reproducibility » Enhancing Reproducibility through Rigor and Transparency

POLICY & COMPLIANCE

Policy Topics

Family-Friendly Initiatives

Rigor and Reproducibility

Enhancing Reproducibility through Rigor and Transparency

The information provided on this website is designed to assist the extramural co
addressing rigor and transparency in NIH grant applications and progress report
transparency in conducting biomedical research is key to the successful applicat
toward improving health outcomes.

Transparency and Openness Promotion (TOP) Guidelines

AUTHORS
Brian Nosek, George Alter, George Banks, Denny Borsboom, Sara Bowman, Steven Breckler, Stuart Buck, Chris Chambers, Gilbert Chin, Garret Christensen, Monica Contestabile, Allan Dafoe, Eric Eich, Jeremy Freese, Rachel Glennerster, Daniel Goroff, Don Green, Bradford Hesse, Macartan Humphreys, John Ishiyama, Dean Karlan, Alan Kraut, Arthur Lupia, Patricia Mabry, Temina Madon, neil malhotra, Evan Mayo-Wilson, Marcia McNutt, Edward Miguel, Elizabeth Paluck, Uri Simonsohn, Courtney Soderberg, Bobbie Spellman, James Turitto, Gary VandenBos, Simine Vazire, Eric-Jan Wagenmakers, Rick Wilson, Tal Yarkoni, Victoria Stodden, Alexander DeHaven

ATED ON
tober 05, 2016
LAST EDITED
July 02, 2018
SUPPLEMENTAL MATERIALS
osf.io/9f6gx/

The National Academies of SCIENCES ENGINEERING MEDICINE

REPRODUCIBILITY AND

Home | Committee Members | Events | Contact Us

ASA
AMERICAN STATISTICAL ASSOCIATION
Promoting the Practice and Profession of Statistics®

Recommendations to Funding Agencies for Supporting Reproducible Research

January 18, 2017

And remember:

“... ask not what you can do for reproducibility; ask what reproducibility can do for you” **- Florian Markowetz**

Markowetz, F. (2015). Five selfish reasons to work reproducibly. *Genome Biology.* 16(274). https://doi.org/10.1186/s13059-015-0850-7

The Schedule

- **Introduction to Reproducibility + Panel** - Ariel Deardorff, UCSF Library
- **Rigorous Experimental Design** – Karla Lindquist, PhD, UCSF Library
- **Open Publishing** - Veronique Kiermer, PhD, and Dan Morgan, PhD, PLOS
- **Open Protocols** – Lenny Teytelman, PhD, Protocols.io
- **Open Code** – Karthik Ram, PhD, BIDS
- **Peer Review** – Jessica Polka, PhD, ASAP Bio
- **Data Publishing** – Daniella Lowenberg, California Digital Library
- **Trust and Transparency** – Elizabeth Silva, PhD, UCSF Graduate Division

Who were our learners?

Mostly people who wanted credit

49 postdocs/grad students registered for the entire series. Of these, **24** people successfully completed the series (49% completion rate).

An additional **20** people from the UCSF community attended at least one workshop.

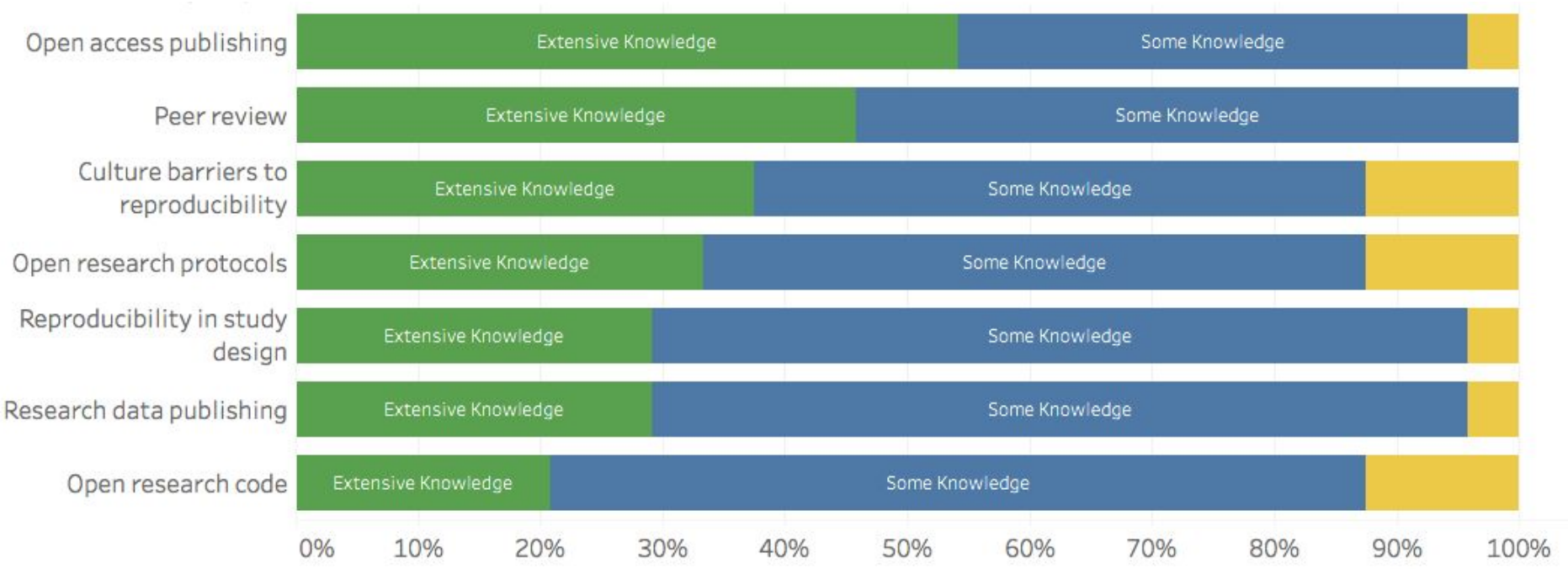
The average workshop had **26** attendees

What did they learn?

Pre and Post Survey

- We asked learners in our graduate student /postdoc cohort to fill out a pre and post workshop survey
- We asked about their:
  - Knowledge of the topic areas
  - Their likelihood of engaging in certain reproducible behaviors
  - Their likelihood of implementing reproducible practices compared to their peers
  - New behaviors they planned on implementing after the series

By the end of the workshop, attendees felt they knew the most about **open access publishing** and **peer review**

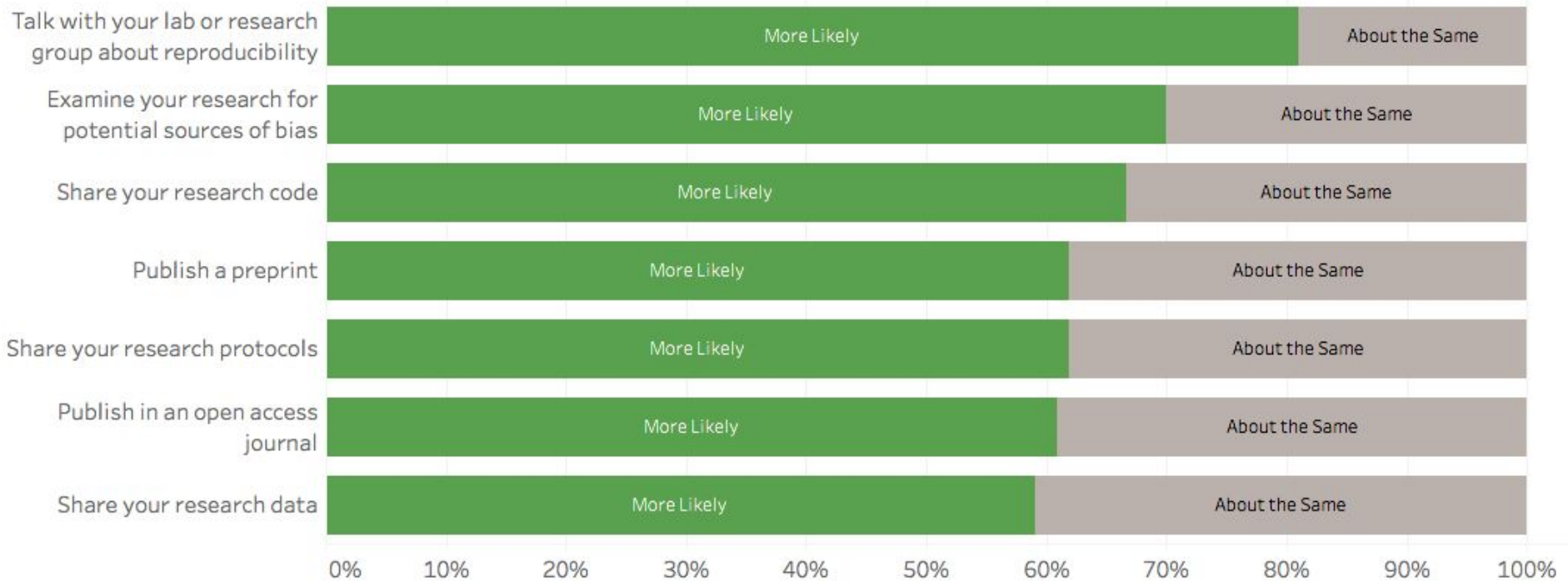


The percentage of attendees who thought they had **extensive knowledge of a topic** increased the most for **open access publishing** and **cultural barriers to reproducibility in the lab**

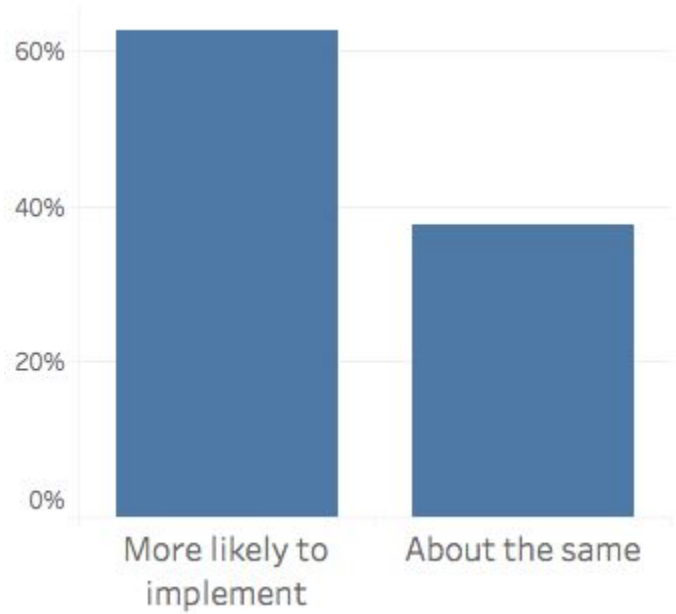
Increase in % of people who said they had **extensive knowledge of the topic** before versus after the workshop

- Open access publishing **+38%**
- Cultural barriers **+32%**
- Open research protocols **+28%**
- Open research code **+14%**
- Reproducibility in study design **+10%**
- Peer review **+8%**
- Research data publishing **-2%**

Compared to before the workshop, attendees were **80% more likely to talk with their lab about reproducibility.**



63% of attendees believed they were **more likely to implement reproducible practices than their peers**



When asked what they planned on changing because of the workshop, **50% of attendees mentioned better recordkeeping and protocol documentation**

Summary of changes:

- Better recordkeeping and protocol documentation (12)
- Publish protocols on protocols.io (5)
- Better version control (4)
- Better code documentation (4)
- Switch to electronic lab notebooks (3)
- Design better code (1)
- Publish their data (1)
- Have a fellow grad student replicate experiments (1)
- Pre-plan their data analysis (1)
- Seek more feedback/peer review from colleagues (1)
- Better data storage (1)

Looking Ahead

Suggestions for future topics focused on **experimental design** and **convincing others to be more reproducible**

Suggestions for future topics include:

- How to convince others to implement reproducible practices (3)
- Experimental design (3)
- Panel discussion on reproducibility with faculty, funders, and journals (2)
- Data sharing
- Good practices in research
- Institutional resources to promote publishing open access
- How to handle large dataset collection/documentation/analysis
- How to incorporate better reproducible practices into work
- How hiring practices take reproducibility into account
- Future of scholarly publishing

Attendees thought the course could have **spent more time on solutions to reproducibility issues**

Suggestions for improvements

- More focus on solving problems/ highlighting good practices (3)
- Shorter talks (2)
- Multiple speakers for each topic to avoid tool bias (2)
- Smaller room (2)
- Toolkit presentation that summed up all the resources/places to learn more
- Switch to Parnassus sometimes
- Offer in the morning
- More discussion

Next Steps

Revise the curriculum for a series of online workshops in Spring 2021

Summarize our experience in a book chapter for the forthcoming *ACRL Scholarly Communications Cookbook.*

Thanks to:

- Anneliese Taylor, Head of Scholarly Communication, UCSF Library
- Elizabeth Silva, Associate Dean of Graduate Programs, UCSF
- UCSF Open Science Group

Questions?

Email ariel.deardorff@ucsf.edu!