A BRIEF OVERVIEW OF OPEN SCIENCE PRACTICES: PRE-REGISTRATION ON OSF AND REGISTERED REPORTS

STATS LUNCH
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AGENDA

What is open science & why do we need it?

Open science resources

Study pre-registration

Using templates on OSF

Registered Reports & open access publishing

Final tips & takeaways

MANY OF US HAVE SOME EXPERIENCE WITH OR AWARENESS OF OPEN SCIENCE PRACTICES

WHEN I WAS A GRADUATE STUDENT…

npr

NEWSLETTERS SIGN IN NPR SHOP DONATE

NEWS CULTURE MUSIC PODCASTS & SHOWS SEARCH

EDUCATION

Harvard professor who studies dishonesty is accused of falsifying data

JUNE 26, 2023 · 1:15 PM ET

Juliana Kim

The New York Times

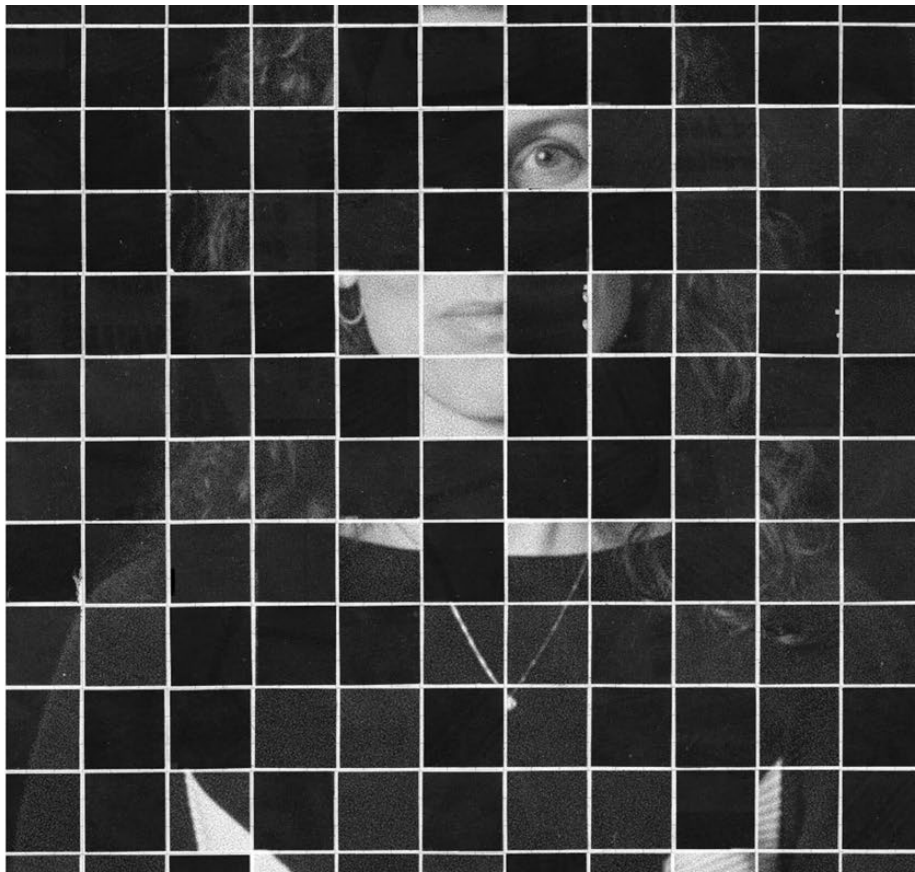
The Harvard Professor and the Bloggers

When Francesca Gino, a rising academic star, was accused of falsifying data — about how to stop dishonesty — it didn't just torch her career. It inflamed a crisis in behavioral science.

DATA COLADA

Thinking about evidence, and vice versa

Account



FUTURE PERFECT

A disgraced Harvard professor sued them for millions. Their recourse: GoFundMe.

The limitations of our process for defending scientific research.

by **Kelsey Piper**
Aug 23, 2023, 6:00 AM PDT

SCIENCEINSIDER | PEOPLE & EVENTS

Honesty researcher's lawsuit against data sleuths dismissed

Judge rules that bloggers sued by Francesca Gino are protected by the First Amendment, but allows some claims against Harvard to proceed

12 SEP 2024 · 11:15 AM ET · BY CATHLEEN O'GRADY

Thinking about evidence, and vice versa

Joe Simmons
@jpsimmon

Gino's case against us has been dismissed.

Scientists cannot effectively sue other scientists for exposing fraud/errors in their work.

Those who work to correct the scientific record can sleep better tonight. Those who don't want it corrected, well, I don't care how they sleep.

2:08 PM · Sep 11, 2024 · **207.6K** Views

536 Reposts **77** Quotes **2,680** Likes **71** Bookmarks

WHAT IS OPEN SCIENCE?

- Movement to increase societal trust in the research process and findings by making them transparent and accessible (i.e., “open”)
- Common practices include:
  - Pre-registering a study plan (e.g., hypotheses, method, analyses)
  - Sharing study data & analysis files (e.g., R or SPSS script)
  - Publishing pre-prints (e.g., PsyArXiv, PDXScholar) & open access articles
- Often required (or strongly encouraged) by journal publishers, editors, and reviewers

WHY DO WE NEED OPEN SCIENCE?

- To increase societal trust in research due to concerns of the replicability crisis
- To guard against the incentives for questionable research practices (QRPs)
  - HARKing
  - p-hacking
  - publication bias
- To encourage a thoughtful approach to research design
- To increase trust in the peer review process
- Open science & open access make research (the process & the output) more accessible and transparent

RESOURCES TO MAKE OPEN SCIENCE EASY

Open Science Framework

https://osf.io/

- Pre-register a study
- Share research materials & data
- Easily control access & anonymity
- Publish pre-prints
- Search public projects
- Free & easy to use, with lots of webinars & videos to learn

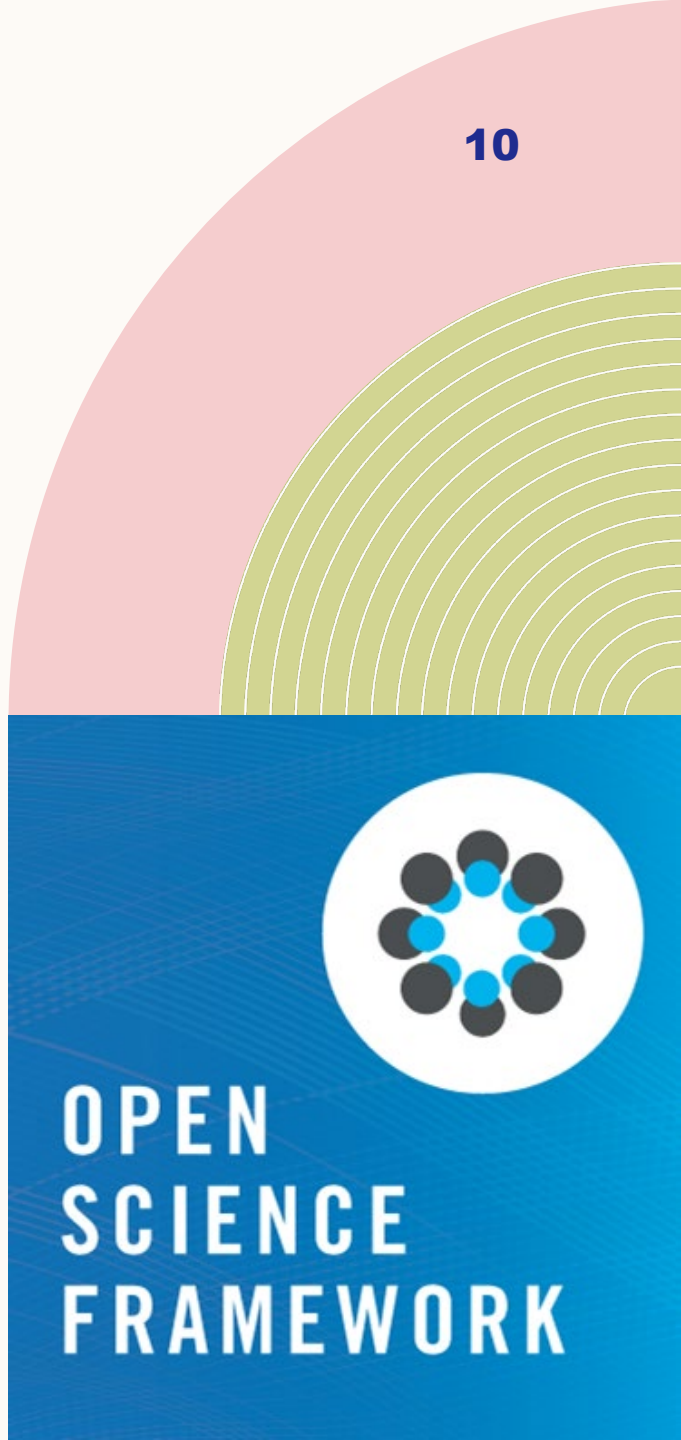
PDX Scholar

https://pdxscholar.library.pdx.edu/

- Create & share pre-prints
- Hosts student dissertations & theses
- Supports open access publishing & reading
- Other cool stuff…

HOW TO PRE-REGISTER A STUDY

1. Create a free account on https://osf.io/ (link to ORCID)
2. Create a new project
3. Click on the Registrations tab & start a New Registration
4. There are many registration form options. I recommend the template from AsPredicted.org - simple, but thorough & popular
5. Start Draft
6. Fill in the required fields with as much info as possible
7. Save Registration



HOW TO PRE-REGISTER A STUDY

- *Note*: once created, registrations cannot be edited or deleted!

- What to do if your study plan changes?
  - Start a new project/ registration OR update your registration (a record of the original will still be there)

- There are options to register a study after data are collected, but it is not advised

OPEN SCIENCE FRAMEWORK

HOW TO SHARE DATA OR OTHER FILES

On OSF:

1. Sign into your OSF account
2. Navigate to your project
3. Go to the "Files" tab
4. Use the green + to upload files
5. Optional: organize files & provide metadata tags
6. If this is for anonymous peer review, generate a "view only" link for your project & desired components

OPEN SCIENCE FRAMEWORK

HOW TO SHARE DATA OR OTHER FILES

On journal publisher website:

1. Attach file during submission process as supplemental online material (SOM)

- I typically format a SOM with a table of contents first
- The journal hosts the SOM, not you or OSF (e.g., https://doi.org/10.1016/j.socscimed.2023.115814)

ELSEVIER

REGISTERED REPORTS

- *Goal:* improve research transparency & rigor, reduce QRP's
- Stage 1: Initial submission & review
  - Submit a detailed research proposal to a journal for peer review BEFORE data is collected or analyzed
  - If successful, journal provides an in-principle acceptance (IPA)
- Stage 2: Conduct the research & submit for full review
  - After data is collected and analyzed according to the agreed-upon plan in the IPA, peer review confirms you carried out what was agreed and that you interpret the results correctly
- Stage 3: The paper is published

SELECT APPLIED PSYCH JOURNALS THAT ALLOW REGISTERED REPORTS

I-O/OHP

- Journal of Applied Psychology
- Journal of Business and Psychology
- Journal of Occupational Health Psychology
- Applied Psychology: Health & Well-Being

Social

- Journal of Personality & Social Psychology
- Social Psychology and Personality Science
- Personality and Social Psychology Bulletin
- Journal of Experimental Social Psychology

SELECT APPLIED PSYCH JOURNALS THAT ALLOW REGISTERED REPORTS

Community

- American Journal of Community Psychology
- Journal of Community & Applied Social Psychology
- Journal of Prevention and Intervention in the Community
- Community Psychology in Global Perspective

Developmental

- Developmental Psychology
- Child Development
- Developmental Science
- Journal of Research on Adolescence

DOES ANYONE HAVE FIRST-HAND EXPERIENCE WITH SUBMITTING A REGISTERED REPORT FOR REVIEW?

CHALENGES OF OPEN SCIENCE IN APPLIED PSYCH & FIELD-BASED RESEARCH

- Confidentiality and privacy concerns with data sharing & transparency
  - Regulatory/ legal barriers (e.g., HIPAA, data protection laws)
- Questions of intellectual property and proprietary information with organizational partners
- Risk of misinterpretation and misuse of openly shared data and materials, particularly for vulnerable populations or when findings are nuanced
- Challenges to the academic institution for incentives & recognition
- Potential conflicts between collaborator goals and researchers' desire to promote open access (who is the beneficiary?)
- *Potential solutions:* use privacy or restricted-access settings on OSF (or other repositories), anonymize data, or only share upon request and with approval

Article

https://doi.org/10.1038/s41562-023-01749-9

High replicability of newly discovered social-behavioural findings is achievable

Received: 25 April 2023

Accepted: 5 October 2023

Published online: 9 November 2023

Check for updates

John Protzko[1,2] ✉, Jon Krosnick[3], Leif Nelson[4], Brian [illegible] Nosek[5,6], Jordan Axt[7], Matt Berent[8], Nicholas Buttrick[9], Matthew DeBell[3], Ch[illegible]R. Ebersole[6], Sebastian Lundmark[10], Bo MacInnis[3], Michael O'Donnell[11], Hannah Perfecto[12], James E. Pustejovsky[13], Scott S. Roeder[14], Jan Walleczek[15] & Jonathan W. Schooler[1]

Failures to replicate evidence of new discoveries have forced scientists to ask whether this unreliability is due to suboptimal implementation of methods or whether presumptively optimal methods are not, in fact, optimal. This paper reports an investigation by four coordinated laboratories of the prospective replicability of 16 novel experimental findings using rigour-enhancing practices: confirmatory tests, large sample sizes, preregistration and methodological transparency. In contrast to past systematic replication efforts that reported replication rates averaging 50%, replication attempts here produced the expected effects with significance testing ($P < 0.05$) in 86% of attempts, slightly exceeding the maximum expected replicability based on observed effect sizes and sample sizes. When one lab attempted to replicate an effect discovered by another lab, the effect size in the replications was 97% that in the original study. This high replication rate justifies confidence in rigour-enhancing methods to increase the replicability of new discoveries.

Science progressively learns about the world through the discovery of replicable findings[1,2]. Efforts to systematically replicate studies across various scientific fields have reported seemingly disappointing replication rates ranging from 30% to 70%, with effect sizes (ESs) about half the size of the original findings[3–13]. This has been a cause for concern among many—but not all[14,15].

Seemingly low replicability can be the consequence of false positives or exaggerated ESs among the original studies, resulting from low statistical power, measurement problems, errors, *P*-hacking and regression to the mean due to selective reporting favouring original positive results[15,16]. Low replicability can also be the consequence of false negatives or suppressed ESs among replication studies, resulting from sampling error, low statistical power, heterogeneity of the phenomena, different analytic strategies, questionable research practices and/or lack of fidelity to the original protocols[17–22]. Finally, failures to replicate or declining ESs can be the consequence of unknown or unarticulated moderating influences and boundary conditions that differ between the original and replication studies, indicating shortcomings in the theoretical and methodological specifications[23].

Collectively, these factors comprise likely explanations for why replications are less successful and produce weaker ESs over time[24–26]. In this Article, we report the results of a prospective replication study

Matters Arising | Published: 24 September 2024

Claims about scientific rigour require rigour

Joseph Bak-Coleman ✉ & Berna Devezer

Nature Human Behaviour **8**, 1890–1891 (2024) | Cite this article

'Doing good science is hard': retraction of high-profile reproducibility study prompts soul-searching

A paper by some of the biggest names in scientific integrity is retracted for issues including misstatements about the research plan.

TAKEAWAYS

- Open science practices can benefit society, science, and researchers
- Pre-registration can increase transparency and reduce QRP's
  - AsPredicted.org template on OSF
- Sharing data, materials, and pre-prints make research replicable & accessible
- Registered reports can protect researchers from QRP's
- Keep in mind the unique challenges of open science practices when working with community partners and vulnerable populations
- Open science standards can be challenging! Do the best you can!

THANK YOU

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