Flinders UNIVERSITY

OPEN RESEARCH INTENSIVE

14–16 JUNE 2022

Supporting open, rigorous and reproducible research at Flinders.

Flinders University acknowledges the Traditional Owners of the lands on which its campuses are located, these are the Traditional Lands of the Arrernte, Dagoman, First Nations of the South East, First Peoples of the River Murray & Mallee region, Jawoyn, Kaurna, Larrakia, Ngadjuri, Ngarrindjeri, Ramindjeri, Warumungu, Wardaman and Yolngu people. We honour their Elders and Custodians past, present and emerging.

Today, almost **400 ABORIGINAL AND TORRES STRAIT ISLANDER STUDENTS** are enrolled in courses at Flinders University.

Flinders UNIVERSITY | **FEARLESS**

June 14, 2022

Slides: osf.io/5vs82/

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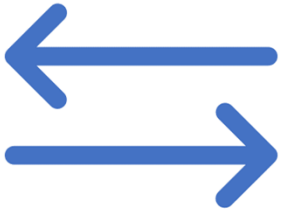
Introduction to Open Research

Dr Jen Beaudry

Replication Crisis

Are things changing?



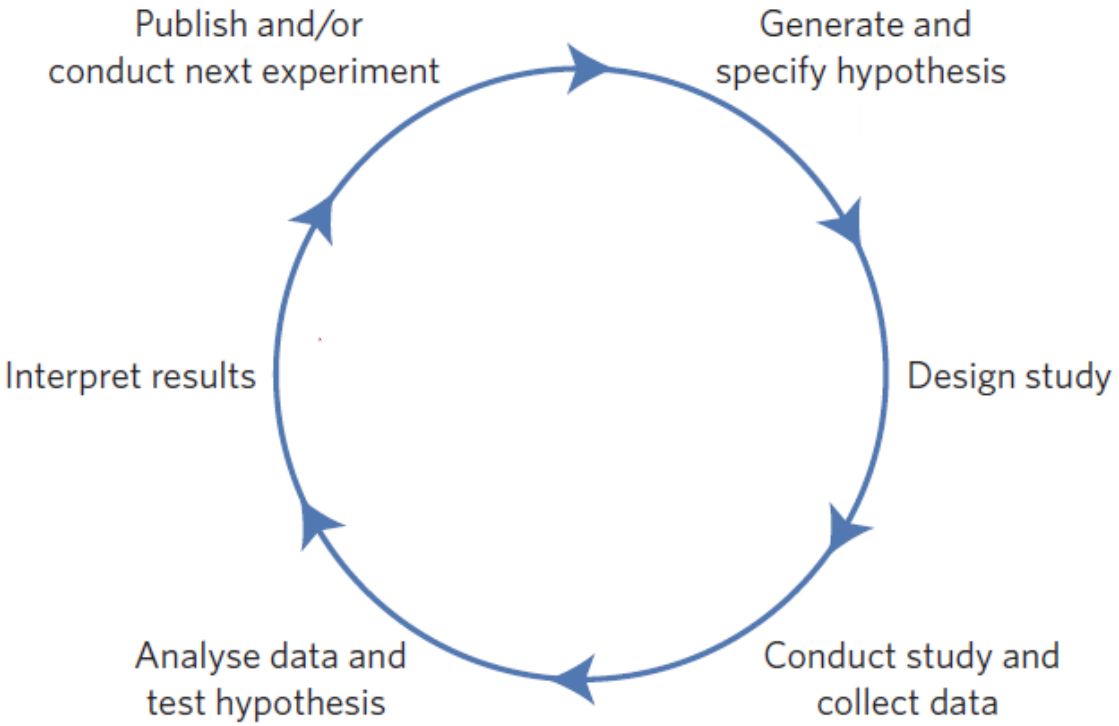
Before you begin

As you write up your work

Sharing your work

Replication Crisis

The ideal scientific process



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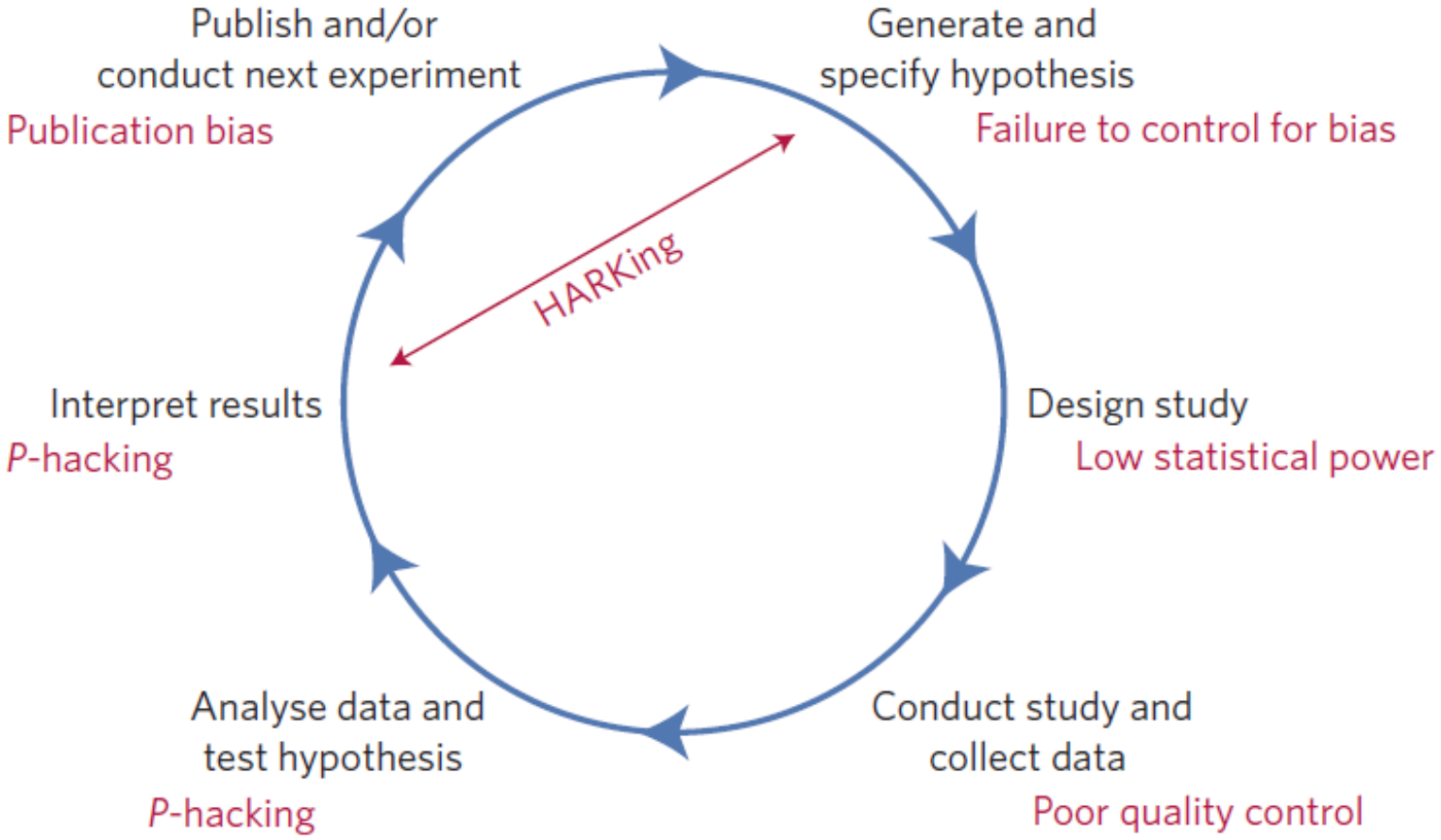
Adapted from Munafo et al., 2017

Questionable Research Practices

- Researcher degrees of freedom (Simmons et al., 2011, 2018)
  - Hypothesising After Results Known (HARKing; Kerr, 1998)
  - *p*-hacking
  - Selective reporting of measures & studies
  - Inappropriate decisions re: data collection



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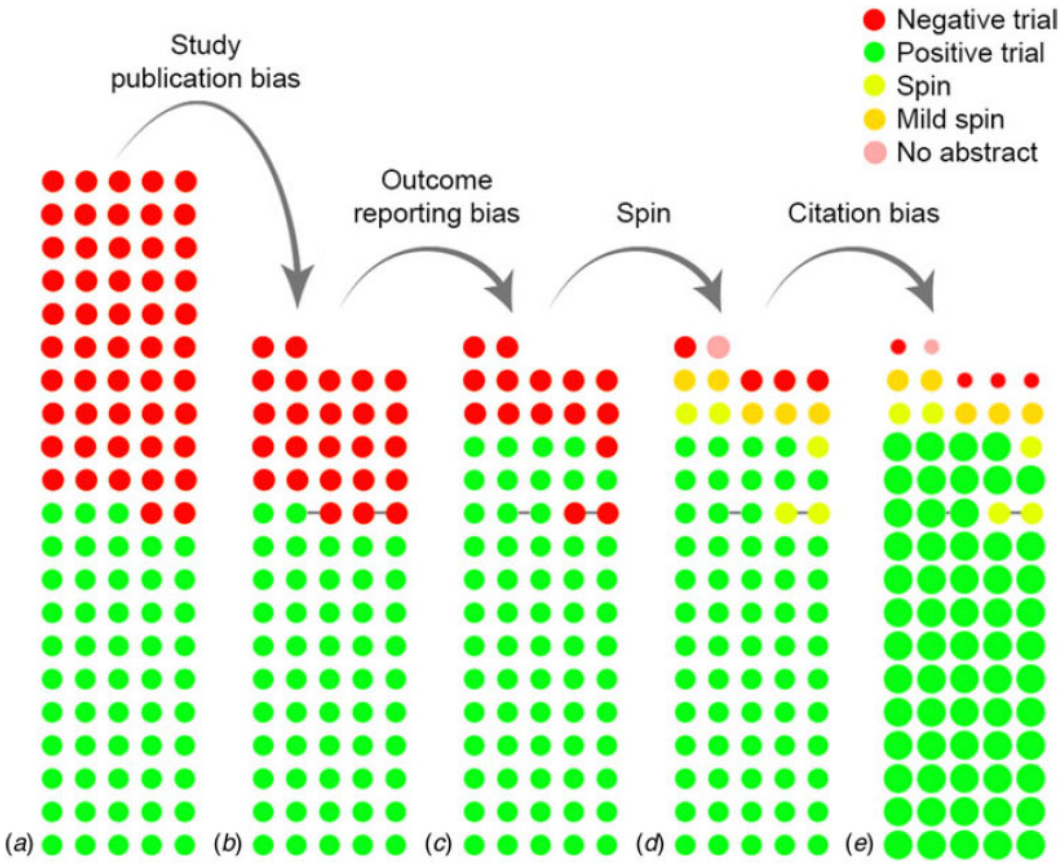
Munafo et al., 2017

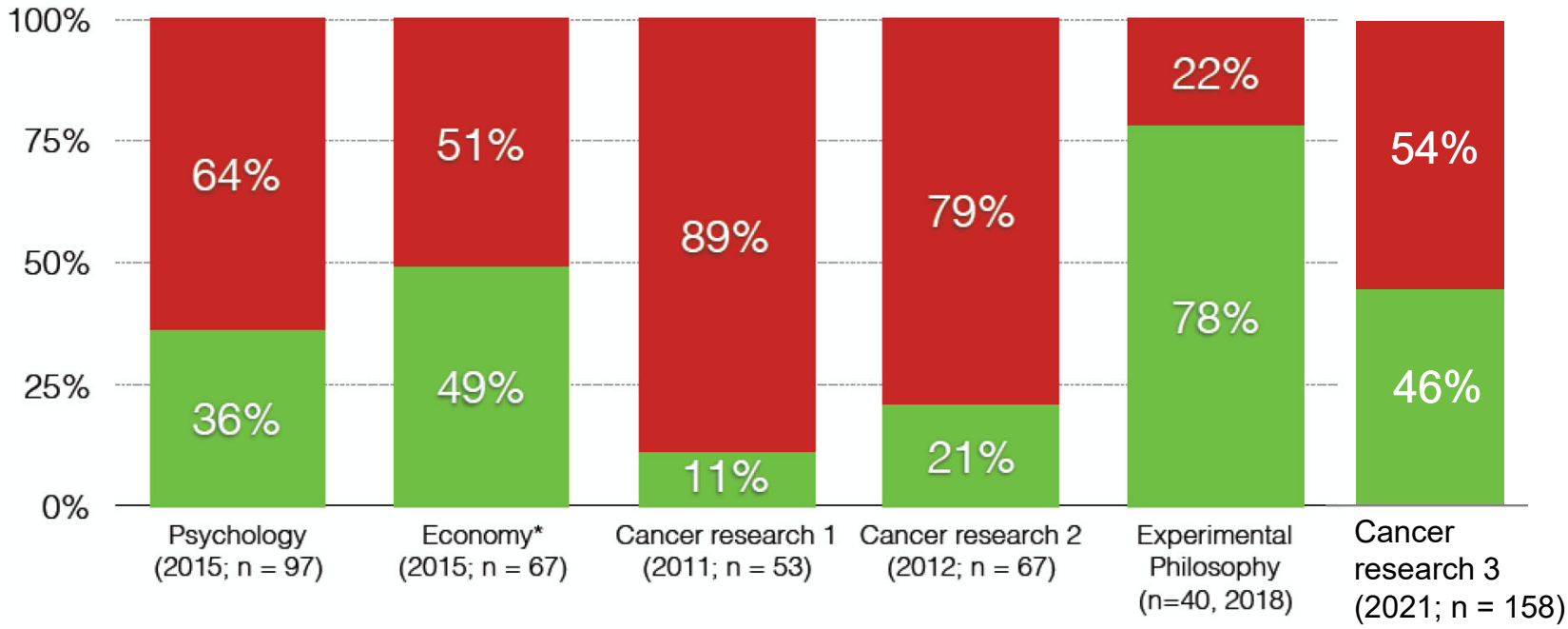
Cumulative effects of biases in reports of anti-depressant efficacy

de Vries et al., 2018

N = 105 registered clinical trials



Which part of published findings can be independently replicated?

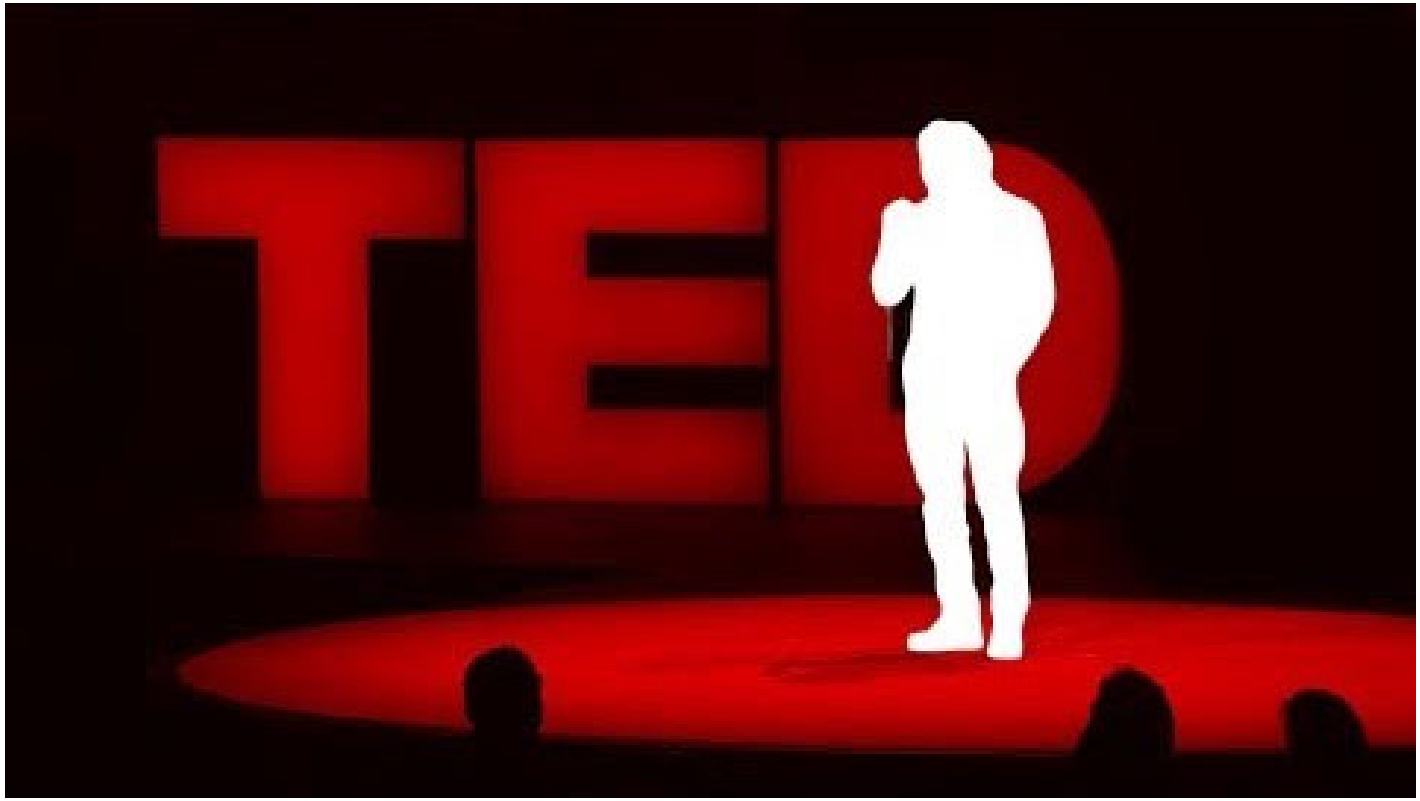


Open Science Collaboration (2015); Chang & Li (2015); Begley, C. G., & Ellis, L. M. (2012). Prinz, F., Schlange, T., & Asadullah, K. (2011); Cova et al. (2018)

Schoenbrodt et al., 2018 + Errington et al., 2022

Renaissance rather than crisis!

The perfect TED talk that never happened



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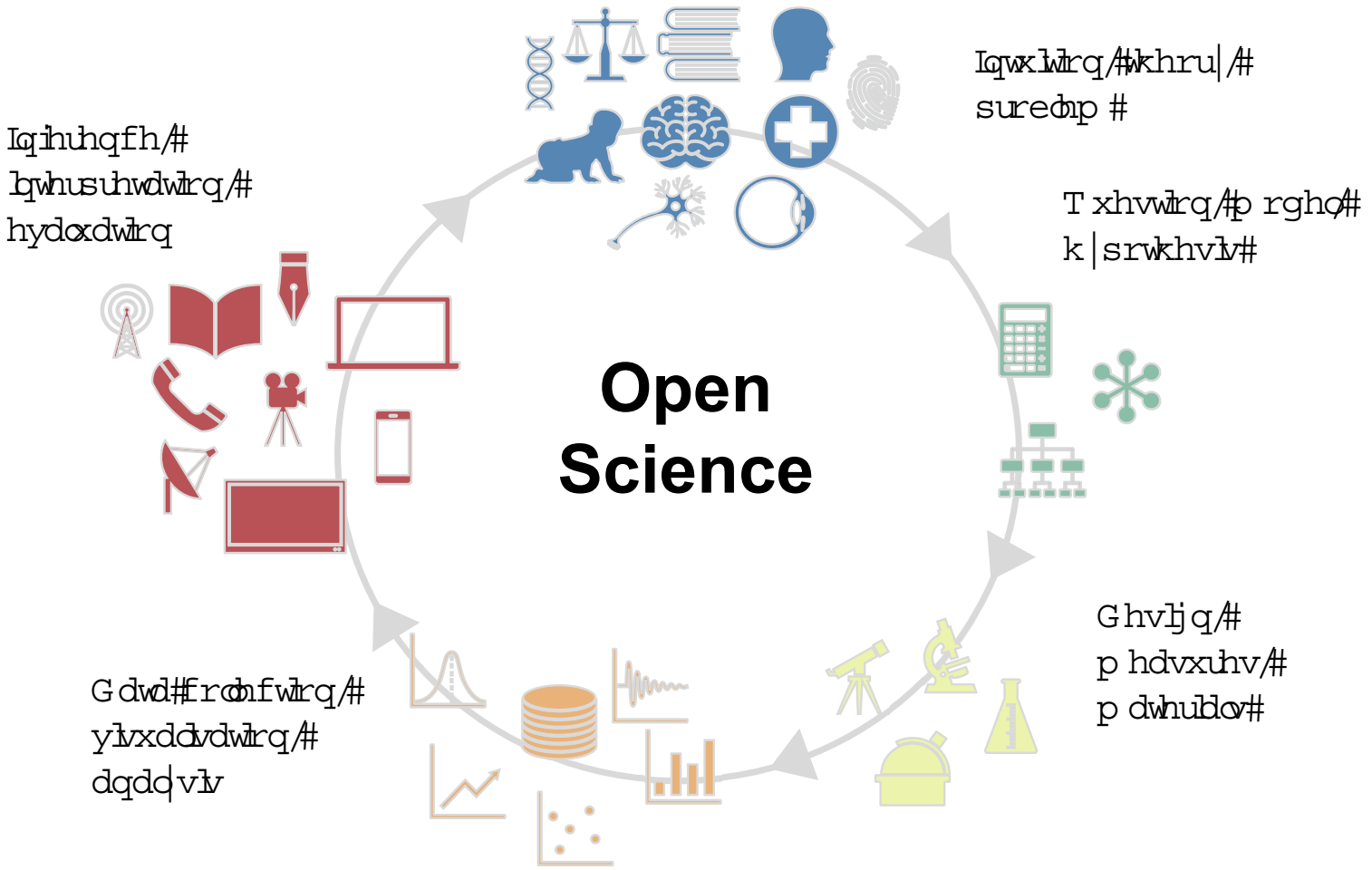

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Searston et al., 2018

Findable

Accessible

Interopable

Reusable

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Before you begin

Preregistration

- Prevents *p*-hacking and HARKing
- Can place under embargo (prevents scooping)
- Can anonymise for peer review
- Can also include exploratory hypotheses
- Can deviate from plans (but justify)
- Can register post-data collection, but pre-analysis

Registration Forms and Templates

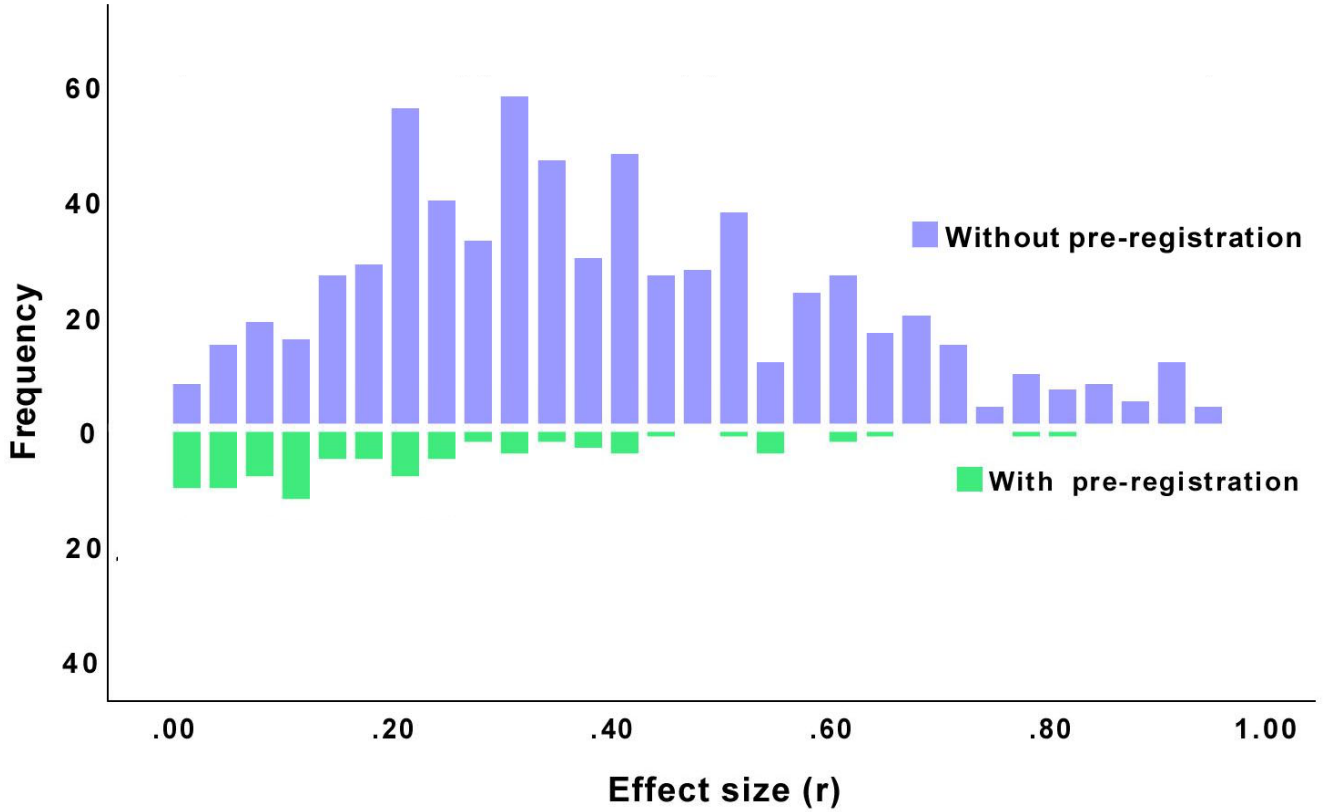
Registration Forms	Description	Templates
OSF Prereg* (citable from this preprint)	This is our standard, comprehensive, and general purpose preregistration form.	Google Doc, OSF Workflow,R Markdown by Frederik Aust, R Markdown by James Bartlett
Open-Ended Registration	Summary of registered work with a time-stamped snapshot of a research project. **Use this one if you are registering a completed project with data or materials.**	Word, GoogleDoc
Qualitative Preregistration* (Haven et al 2020)	Template for registering primarily qualitative work.	Word, GoogleDoc, FAQ
AsPredicted Preregistration* form here	Eight questions derived from content recommended by AsPredicted.org.	Word, GoogleDoc
OSF-Standard Pre-Data Collection Registration	State whether data have been collected or viewed and other pertinent comments. **Use this one if your pre-analysis plan is uploaded on OSF as a doc**	Word, GoogleDoc
Replication Recipe (Brandt et al., 2013): Pre-Registration*	Register a replication study with a series of questions regarding the original work.	Word, GoogleDoc
Replication Recipe (Brandt et al., 2013): Post-Completion	Register a replication study after it has been conducted with questions regarding the outcomes of the replication.	Word, GoogleDoc
Pre-Registration in Social Psychology (van 't Veer & Giner-Sorolla, 2016)*	Preregister a research study outlining the hypotheses, methods, and analysis plan	Word, GoogleDoc, OSF
Registered Report Protocol Preregistration	Register your protocol AFTER having been given "in-principle acceptance" from a Registered Report journal	Word, GoogleDoc, OSF Workflow
Secondary Data Preregistration*	For preregistering a research project that uses an existing dataset.	OSF Page, Example, FAQ

Table 1. The Easy Preregistration Questions on AsPredicted.org

1.	Have any data been collected for this study already?
2.	What's the main question being asked or hypothesis being tested in this study?
3.	Describe the key dependent variable(s) specifying how they will be measured.
4.	How many and which conditions will participants be assigned to?
5.	Specify exactly which analyses you will conduct to examine the main question/hypothesis.
6.	Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
7.	How many observations will be collected or what will determine sample size?
8.	Anything else you would like to preregister?

Simmons et al., 2018

Effect sizes by preregistration



N = 684

N = 89

Adapted from Schafer & Schwarz, 2019

Registered Reports

300+ journals on board!

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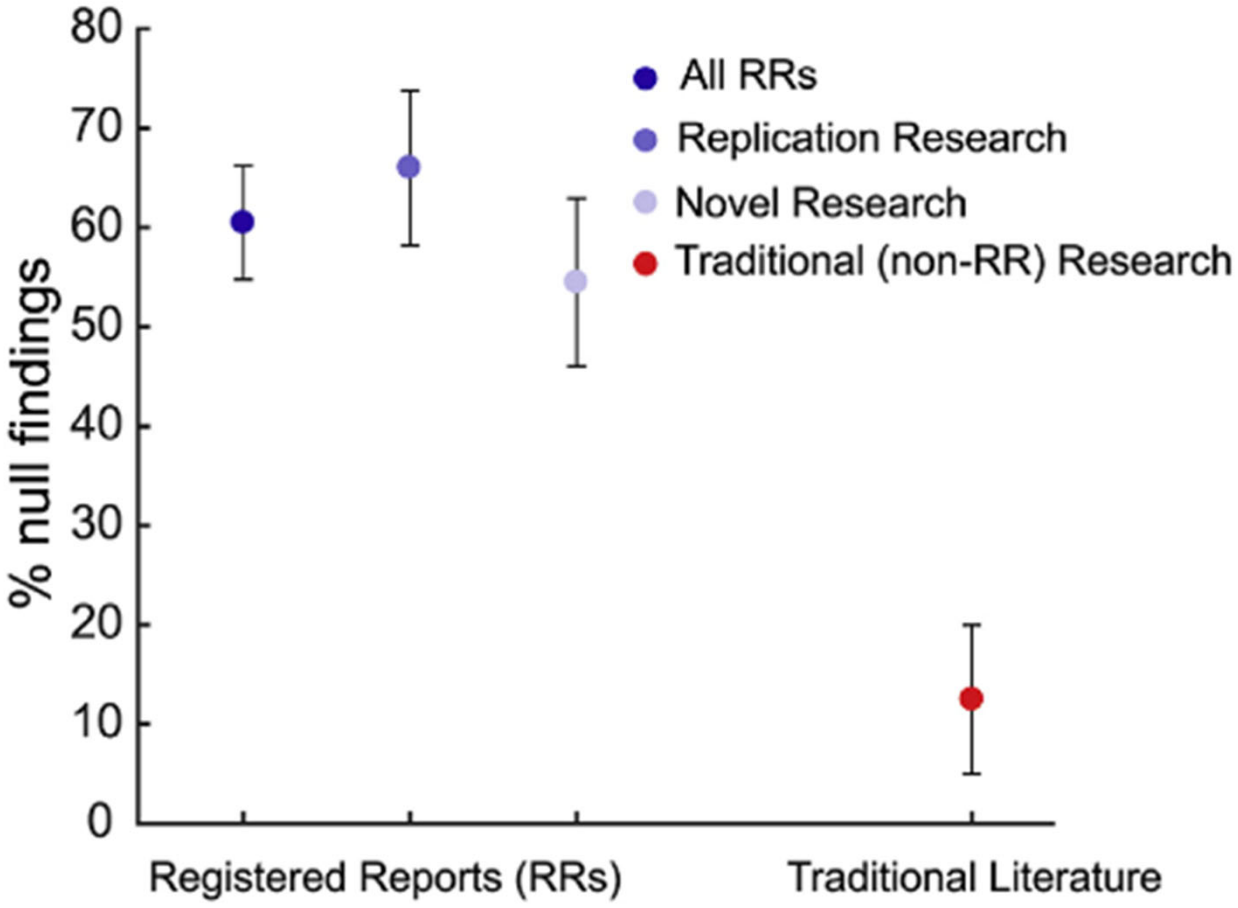
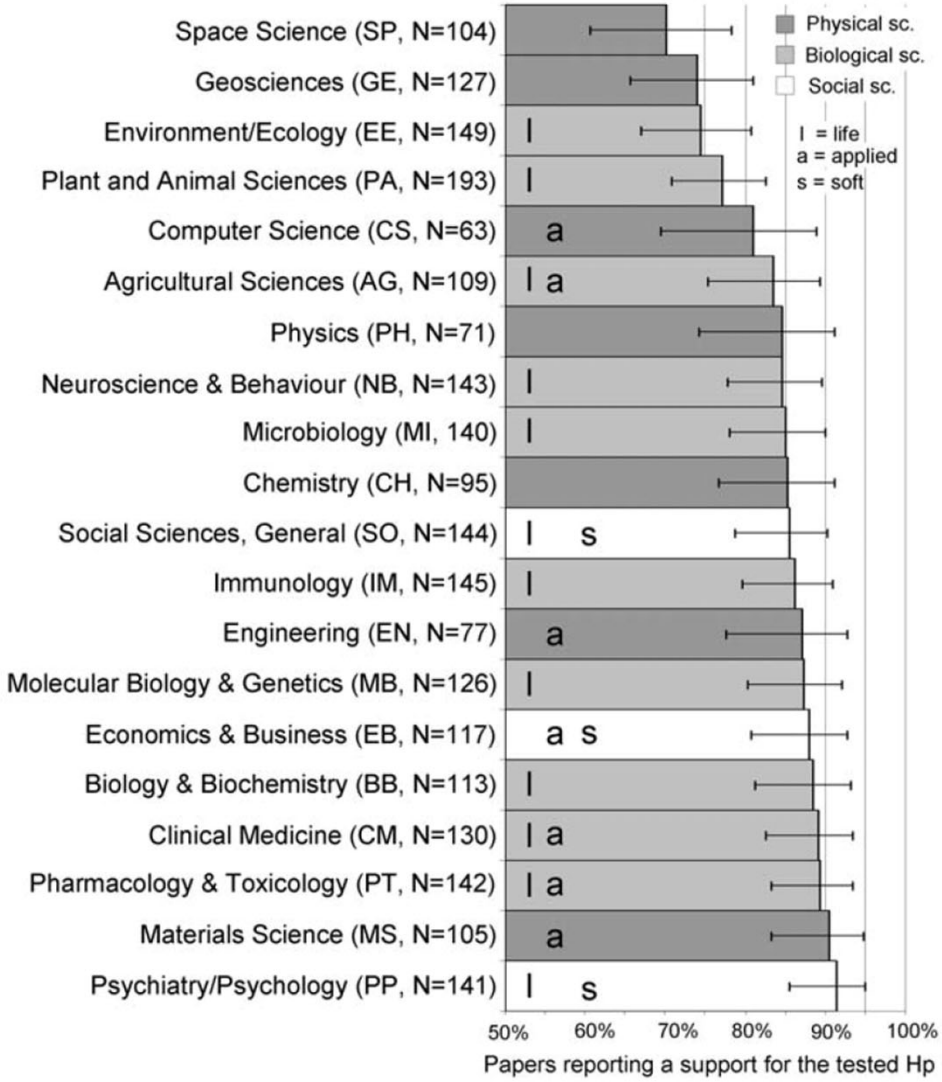
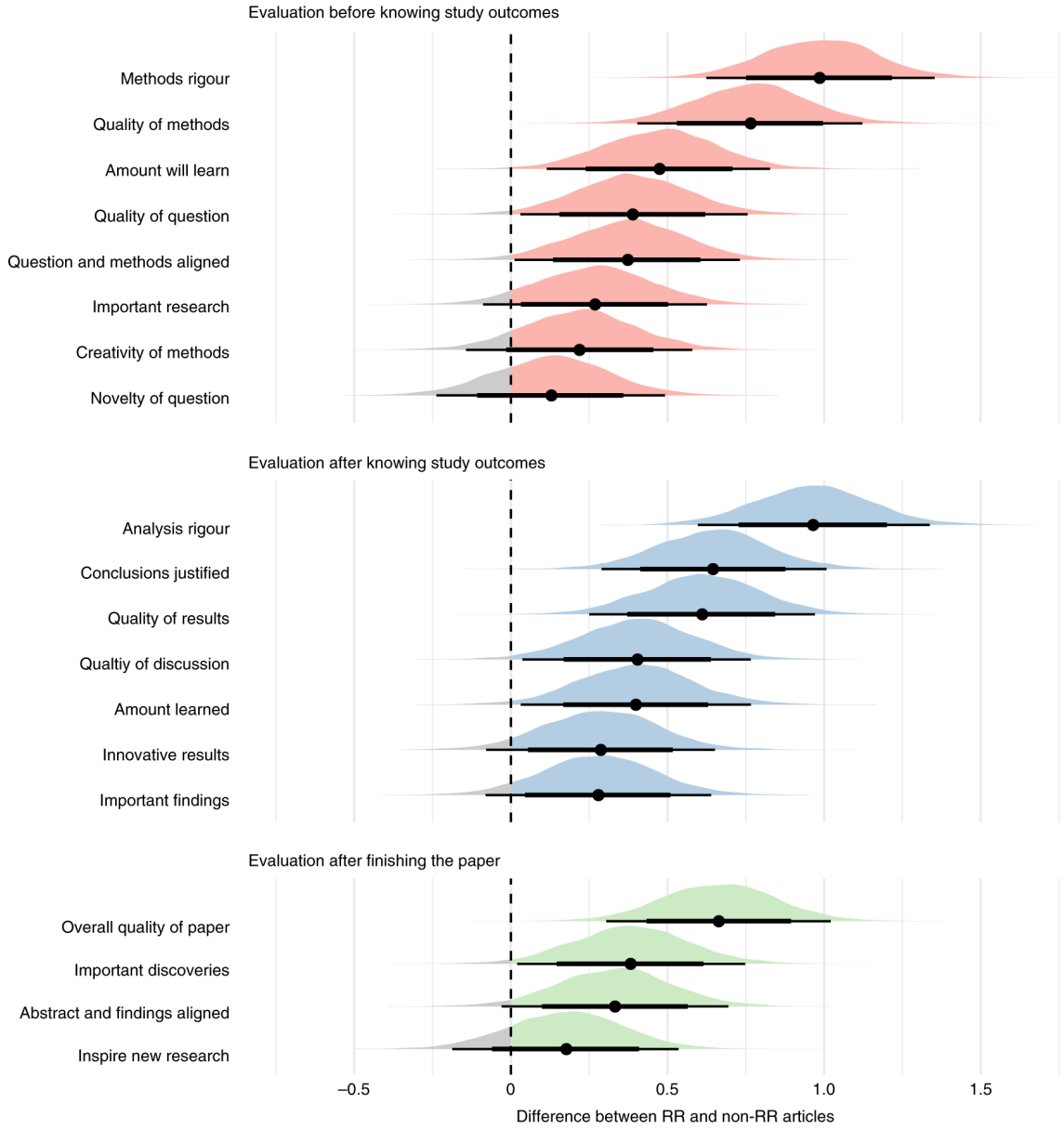
Registered Reports are working as intended



Chin et al, 2020



Fanelli, 2010



Soderberg et al., 2021

Registered Reports Research Grants (RRRGs)

Journals/publishers

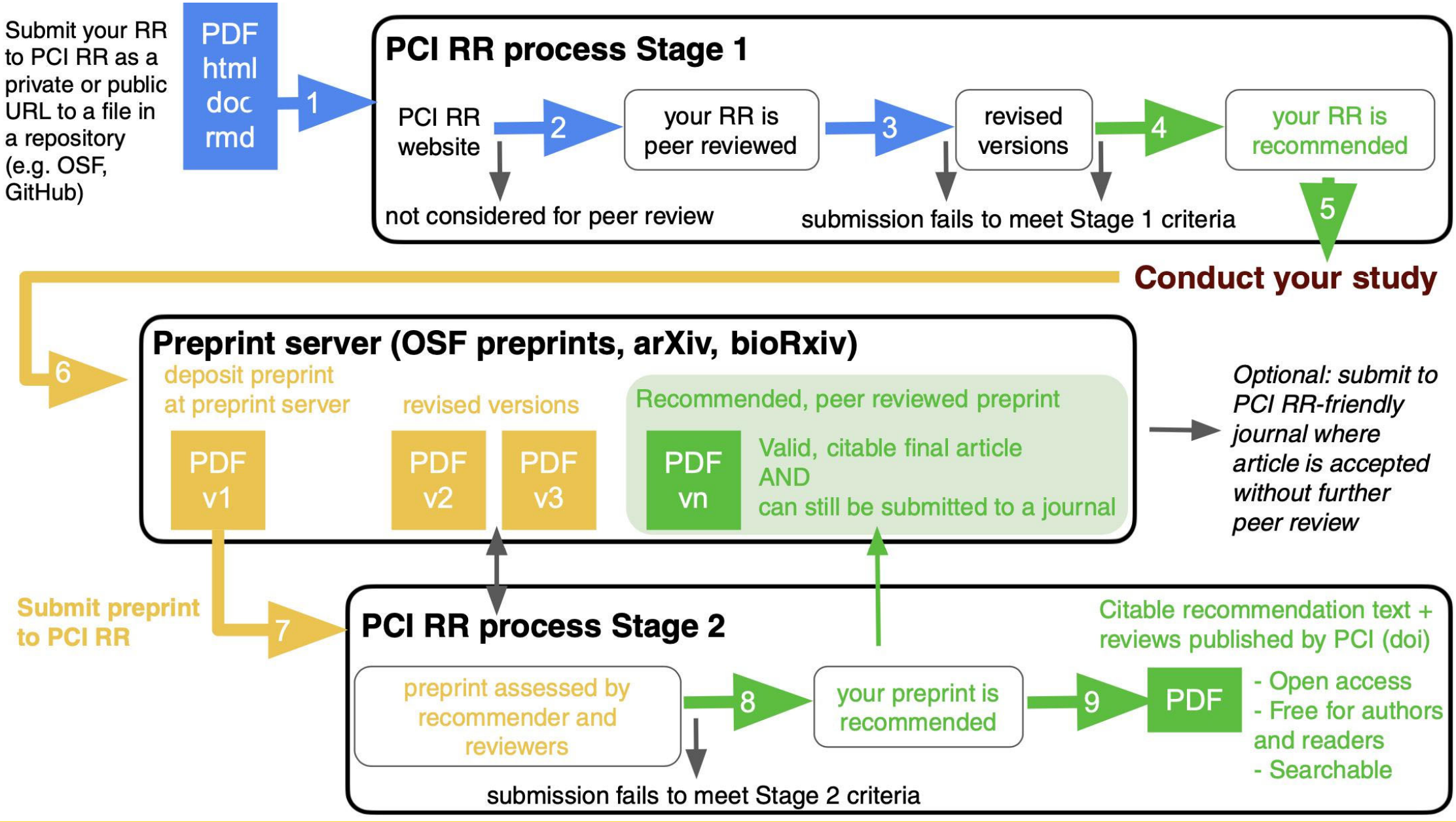
Nicotine and Tobacco Research
PLOS Biology
PLOS ONE
Royal Society Open Science
BMC, including BMC Medicine
Collabra: Psychology

Funders

Cancer Research UK
Pfizer
Children's Tumor Foundation
CHDI
DARPA

https://doi.org/10.1093/ntr/ntx081

Peer Community In Registered Reports


Submit your RR to PCI RR as a private or public URL to a file in a repository (e.g. OSF, GitHub)
PDF
html
doc
rmd
1
PCI RR process Stage 1
PCI RR website
2
your RR is peer reviewed
3
revised versions
4
your RR is recommended
not considered for peer review
submission fails to meet Stage 1 criteria
5
Conduct your study
6
Preprint server (OSF preprints, arXiv, bioRxiv)
deposit preprint at preprint server
revised versions
Recommended, peer reviewed preprint
PDF v1
PDF v2
PDF v3
PDF vn
Valid, citable final article AND can still be submitted to a journal
Optional: submit to PCI RR-friendly journal where article is accepted without further peer review
Submit preprint to PCI RR
7
PCI RR process Stage 2
Citable recommendation text + reviews published by PCI (doi)
preprint assessed by recommender and reviewers
8
your preprint is recommended
9
PDF
- Open access
- Free for authors and readers
- Searchable
submission fails to meet Stage 2 criteria

Consider making your data FAIR in ethics application

Ask colleagues

Talk to Ethics team

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As you write up your work

21-word solution

1. If you are not *p*-hacking and you know it, clap your hands.

Many support our call for transparency, and agree that researchers should fully disclose details of data collection and analysis. Many do not agree. What follows is a message for the former; we begin by preaching to the choir.

Choir: There is no need to wait for everyone to catch up with your desire for a more transparent science. If *you* did not *p*-hack a finding, *say it*, and your results will be evaluated with the greater confidence they deserve.

If you determined sample size in advance, *say it.*

If you did not drop any variables, *say it*.

If you did not drop any conditions, *say it.*

These 21 words in a Methods section can *say it* succinctly:

"We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study."

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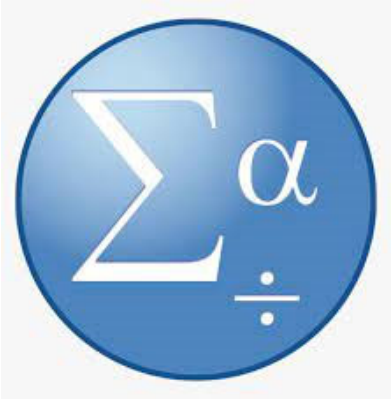
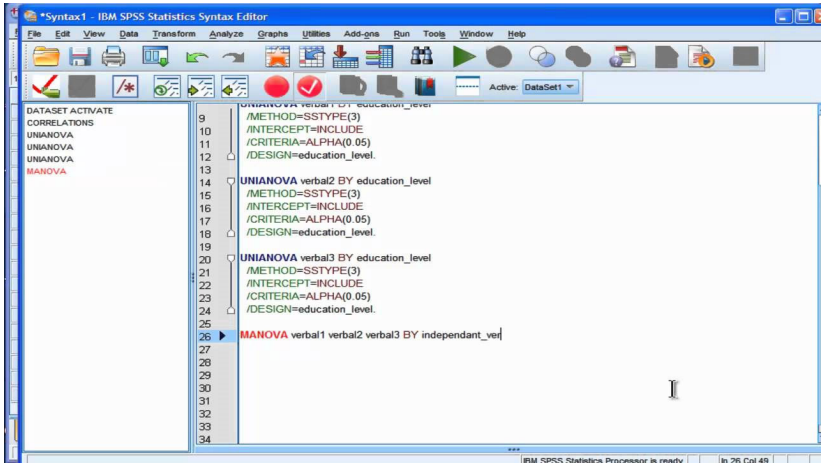
Simmons, Nelson, & Simonsohn, 2012 (link)

Pre-publication, internal error detection

- Can someone reproduce your work?
  - Code/syntax (data cleaning & analyses)
  - Version control!
  - Lab notebook





	Source	Statistical Reference	Computed p Value	Consistency
1	Skalon, Beaudry, Edmonds - Eff (...)	F(1, 549) = 9.68, p = .002	0.00196	Consistent
2	Skalon, Beaudry, Edmonds - Eff (...)	F(1, 549) = 5.50, p = .019	0.01937	Consistent
3	Skalon, Beaudry, Edmonds - Eff (...)	F(2, 549) = 4.69, p = .010	0.00956	Consistent
4	Skalon, Beaudry, Edmonds - Eff (...)	F(1, 549) = 6.19, p = .013	0.01314	Consistent
5	Skalon, Beaudry, Edmonds - Eff (...)	t(282) = 4.17, p < .001	0.00004	Consistent

Share your data and/or code

- Raw & cleaned
- With variable info and metadata
- Can be anonymised for peer-review

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CRediT – Contributor Roles Taxonomy

Author Contributions

JLB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing - original draft, Writing - review & editing; MNW: Investigation, Methodology, Validation, Writing - original draft; MCP: Conceptualization, Investigation, Methodology, Project administration, Writing - original draft; EJK: Conceptualization, Data curation, Validation, Visualization, Writing - review & editing.

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https://casrai.org/credit/

Sharing your work

Open data/methods/code

- Open Science Framework
  - Use as repository for all materials, data, “open notebooks”
  - organise lab projects
  - add collaborators
  - make public/private
  - get an osf link to share
  - anonymise project for blind review
  - [plus help to make all of it happen]

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Please list Flinders as affiliation

Concerns about sharing data

- Practical tips for ethical data sharing (Meyer, 2018)
- Consider creating a synthetic dataset using {synthpop}

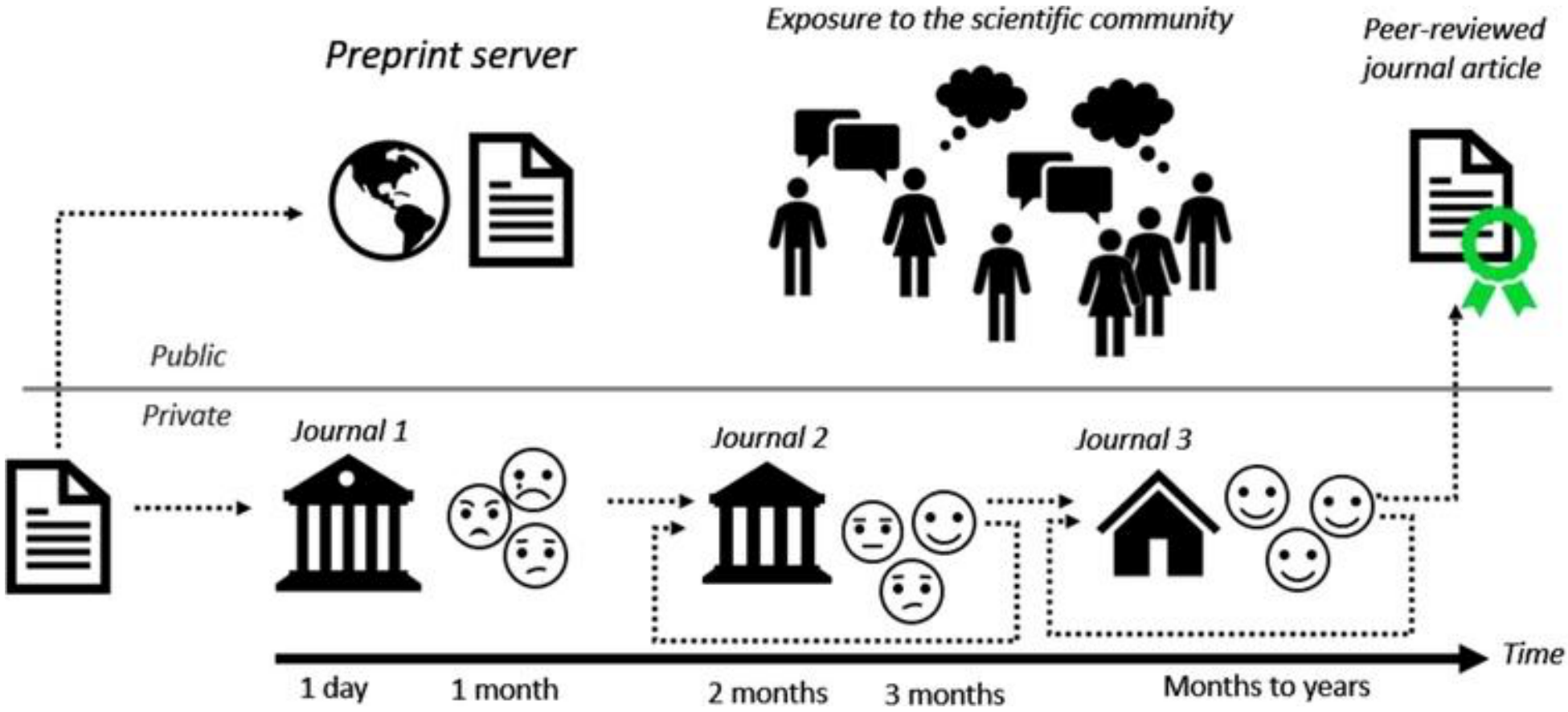
ARTICLES
https://doi.org/10.1038/s41562-021-01142-4

nature human behaviour

Initial evidence of research quality of registered reports compared with the standard publishing model

Courtney K. Soderberg[1,6], Timothy M. Errington[1,6], Sarah R. Schiavone[2], Julia Bottesini[2], Felix Singleton Thorn[3], Simine Vazire[2,3], Kevin M. Esterling[4] and Brian A. Nosek[1,5]

In registered reports (RRs), initial peer review and in-principle acceptance occur before knowing the research outcomes. This combats publication bias and distinguishes planned from unplanned research. How RRs could improve the credibility of research findings is straightforward, but there is little empirical evidence. Also, there could be unintended costs such as reducing novelty. Here, 353 researchers peer reviewed a pair of papers from 29 published RRs from psychology and neuroscience and 57 non-RR comparison papers. RRs numerically outperformed comparison papers on all 19 criteria (mean difference 0.46, scale range −4 to +4) with effects ranging from RRs being statistically indistinguishable from comparison papers in novelty (0.13, 95% credible interval [−0.24, 0.49]) and creativity (0.22, [−0.14, 0.58]) to sizeable improvements in rigour of methodology (0.99, [0.62, 1.35]) and analysis (0.97, [0.60, 1.34]) and overall paper quality (0.66, [0.30, 1.02]). RRs could improve research quality while reducing publication bias and ultimately improve the credibility of the published literature.


Preprint server
Exposure to the scientific community
Peer-reviewed journal article
Public
Private
Journal 1
Journal 2
Journal 3
Time
1 day
1 month
2 months
3 months
Months to years


INA-Rxiv


LawArXiv


LIS
Scholarship
Archive


MarXiv


MindRxiv


AgriXiv

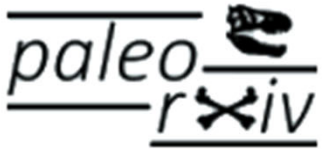

BITSS


Earth ArXiv


ENGINEERING
engrXiv
ARCHIVE


FocUS Archive


NutriXiv


paleo rxiv


PsyArXiv


SOC
ARXIV


SportRxiv

Will your journals allow pre-prints?

Check SHERPA/RoMEO to find relevant policies

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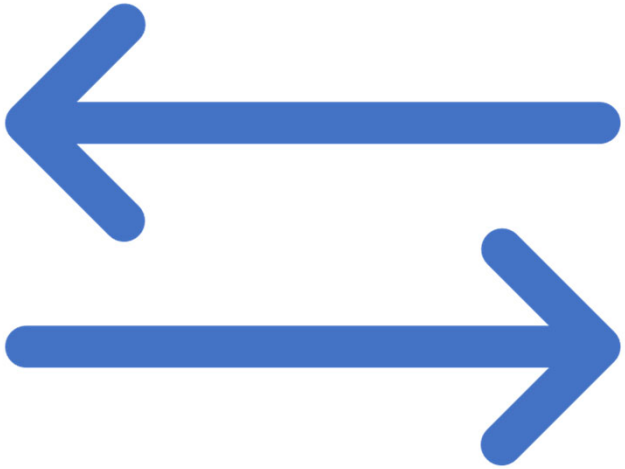
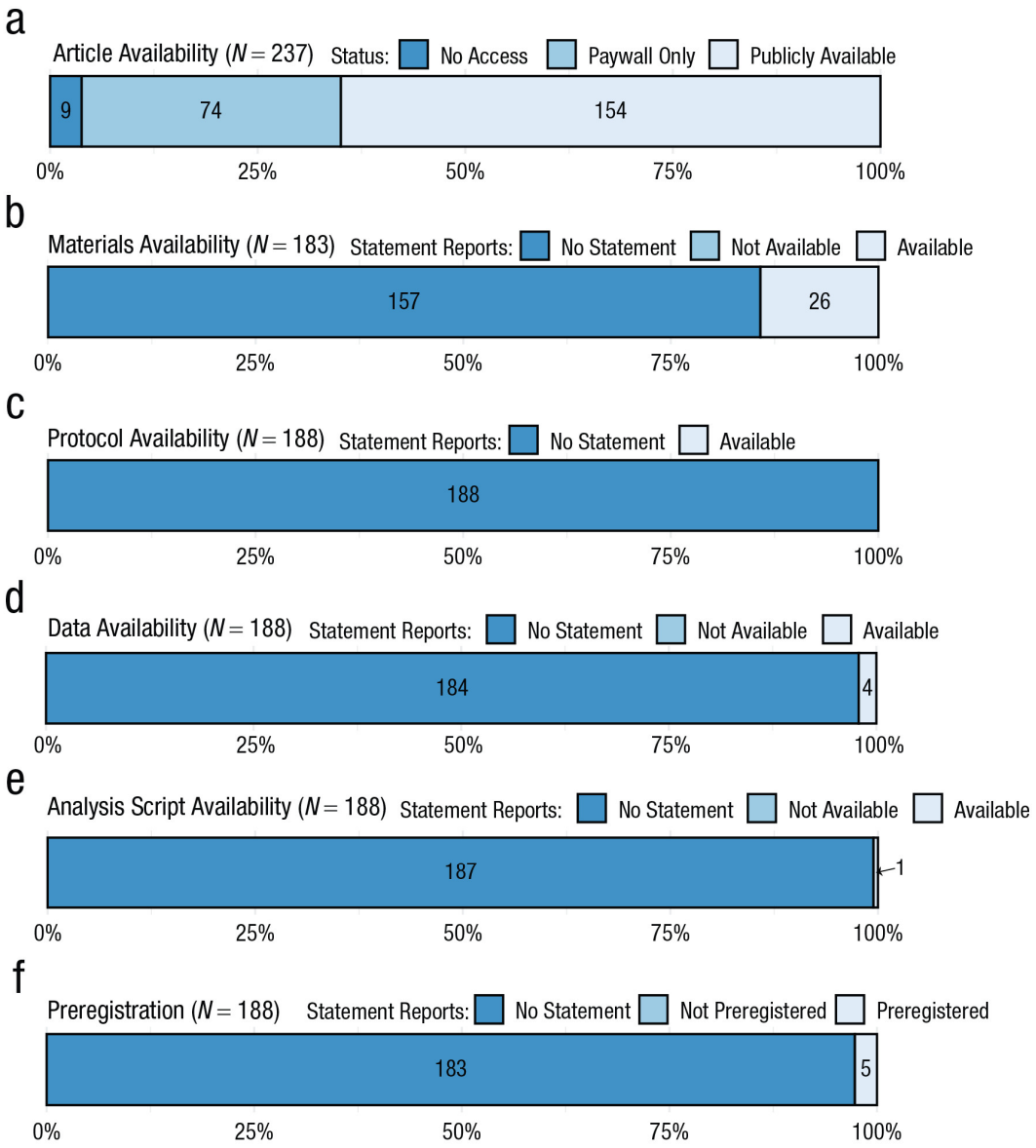
Are things changing?





250 psychology articles (2014–2017)

Hardwicke et al., 2022

“Data available upon request”

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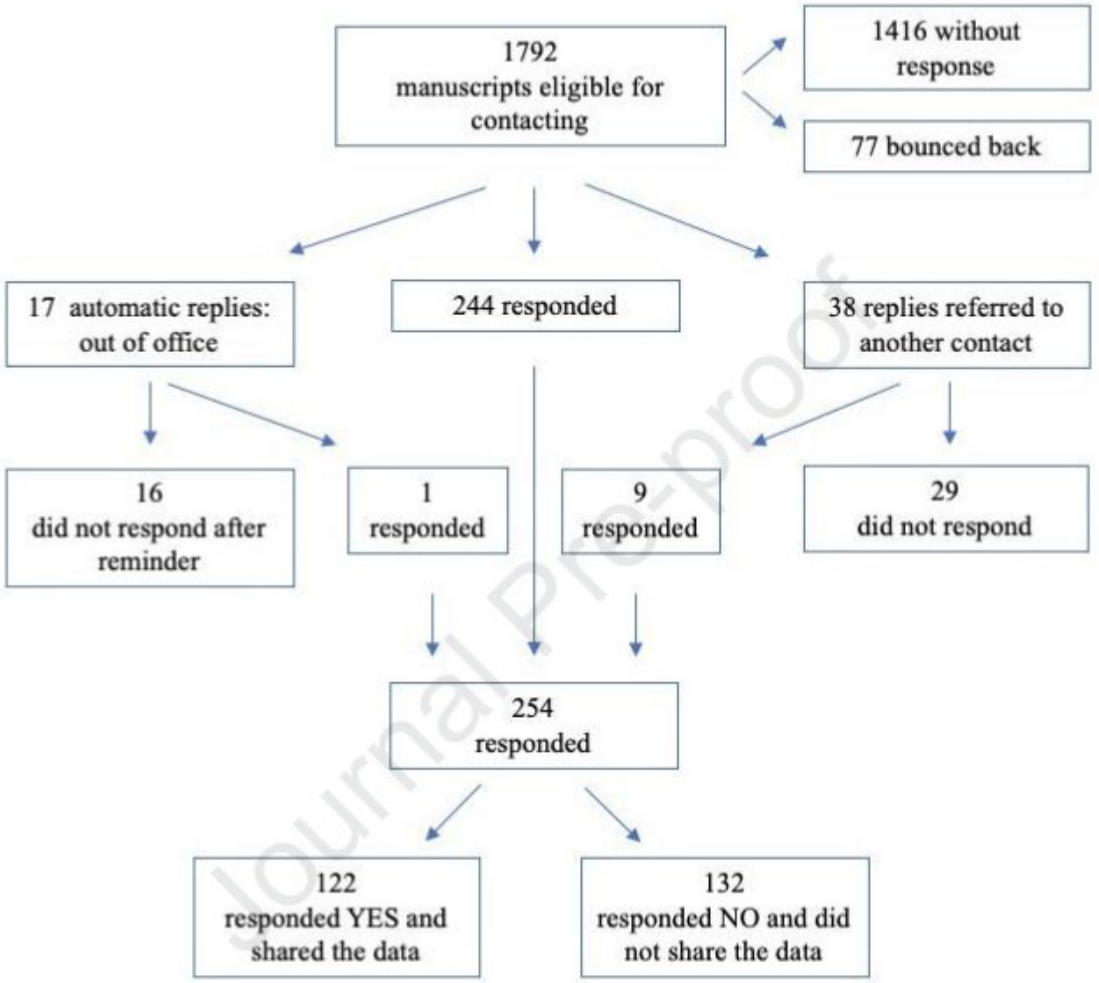
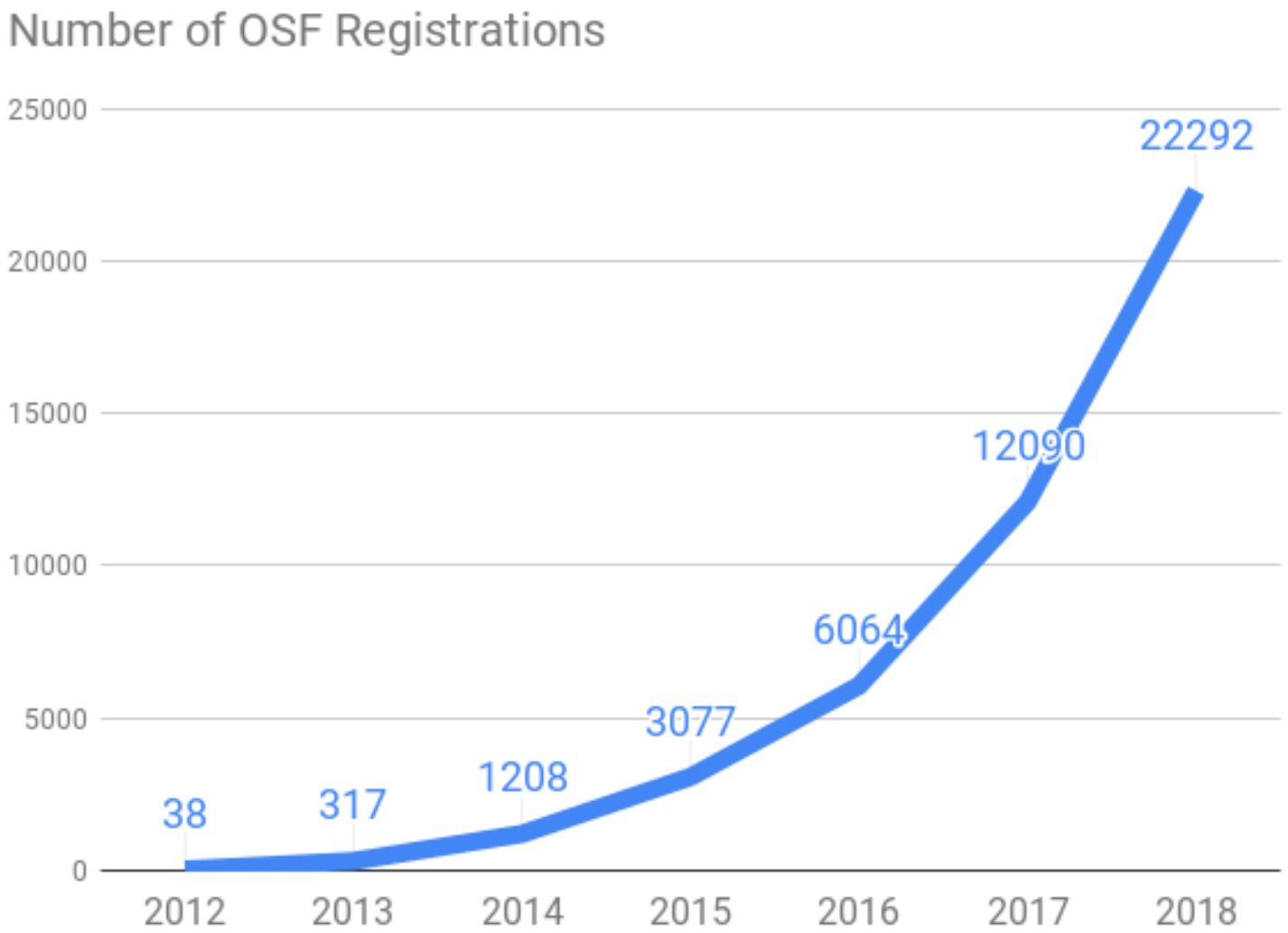
“Data available upon request”



>7% shared their data when requested

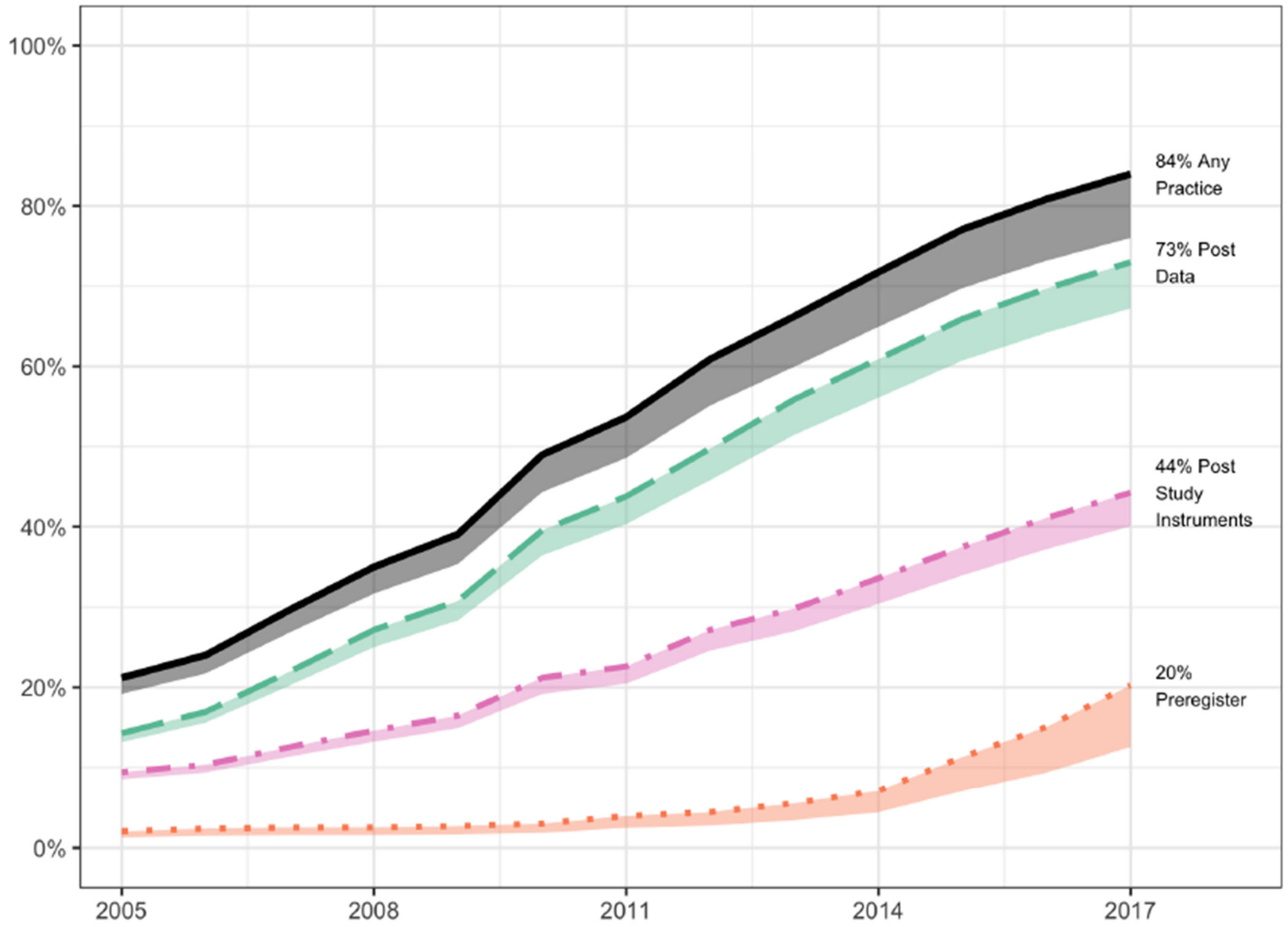
Gavelica, Bojčić, & Puljak, 2022. Journal of Clinical Epidemiology.

100,909
(13 June 2022)



Nosek, 2019

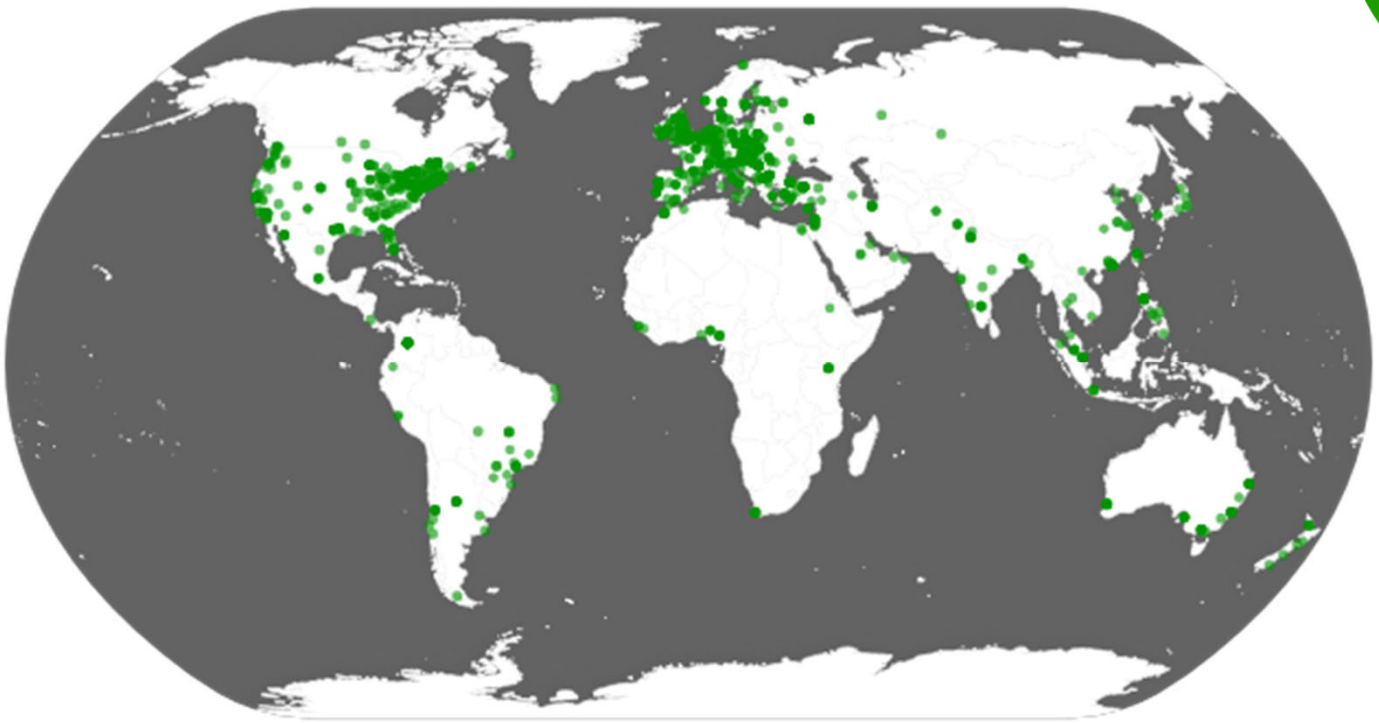
N = 637



Christensen et al., 2019

The Psychological Science Accelerator

1328 researchers, 84 countries



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Open Science in Job Ads

“Our department embraces the values of open science and strives for replicable and reproducible research. We therefore support transparent research with open data, open material, and pre-registrations.

Candidates are asked to describe in what way they have already pursued and/or plan to pursue open science.”

- University of Toronto Ad

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Key takeaways

Start where you are

Every step toward open research should be celebrated

Take advantage of resources

Find or create a community of allies

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OPEN RESEARCH INTENSIVE

14–16 JUNE 2022

Day 1 – Tuesday 14 June

- Introduction to Open Research – 9.30 to 11.00am (in person)
- Open Access Fundamentals & Open Publishing Strategies – 11.30am to 1.00pm (in person)
- Open Educational Resources – 1.30 to 2.30pm (in person)

Day 2 – Wednesday 15 June

- Reproducible Methods and Data Analyses – 9.30 to 11.00am (online)
- Myths & Challenges of Open Research – 12.00 to 1.30pm (in person)
- HASS Research Data Commons & Indigenous Research Capability – 2.00 to 3.00pm (in person)

Day 3 – Thursday 16 June

- Using the Open Science Framework (OSF) for Research Collaborations – 9.30 to 11.00am (online)
- FAIR Principles for Data – 12.00 to 1.30pm (in person)
- FAIR Principles for Research Software – 2.00 to 3.00pm (in person)

Slides: osf.io/5vs82/

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