

The Future of Open Science: The Need to Change Culture to Change Science

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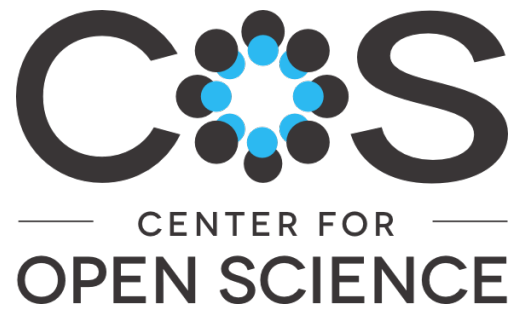
American Psychological Association

April 26, 2021

The Future of Open Science: The Need to Change Culture to Change Science

Brian Nosek, PhD

- Co-founder and Executive Director, Center for Open Science
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- Co-founder, Project Implicit



Shifting the research culture toward openness and reproducibility

Brian Nosek

University of Virginia -- Center for Open Science

These slides: <https://osf.io/3ztr9/>



Why are you doing research?

Are you something like:

“I am curious and like to discover new things. I like solving problems, learning, and working with others to figure things out. I am particularly interested in <problem X>.”

Or more like:

“I like writing papers, trying to get them published, often with lots of rounds of revisions, and applying for grants. I am particularly interested in obtaining a high *h*-index.”

Norms

Communality

Open sharing

Universalism

Evaluate research on own merit

Disinterestedness

Motivated by knowledge and discovery

Organized skepticism

Consider all new evidence, even against one's prior work

Quality

Counternorms

Secrecy

Closed

Particularism

Evaluate research by reputation

Self-interestedness

Treat science as a competition

Organized dogmatism

Invest career promoting one's own theories, findings

Quantity

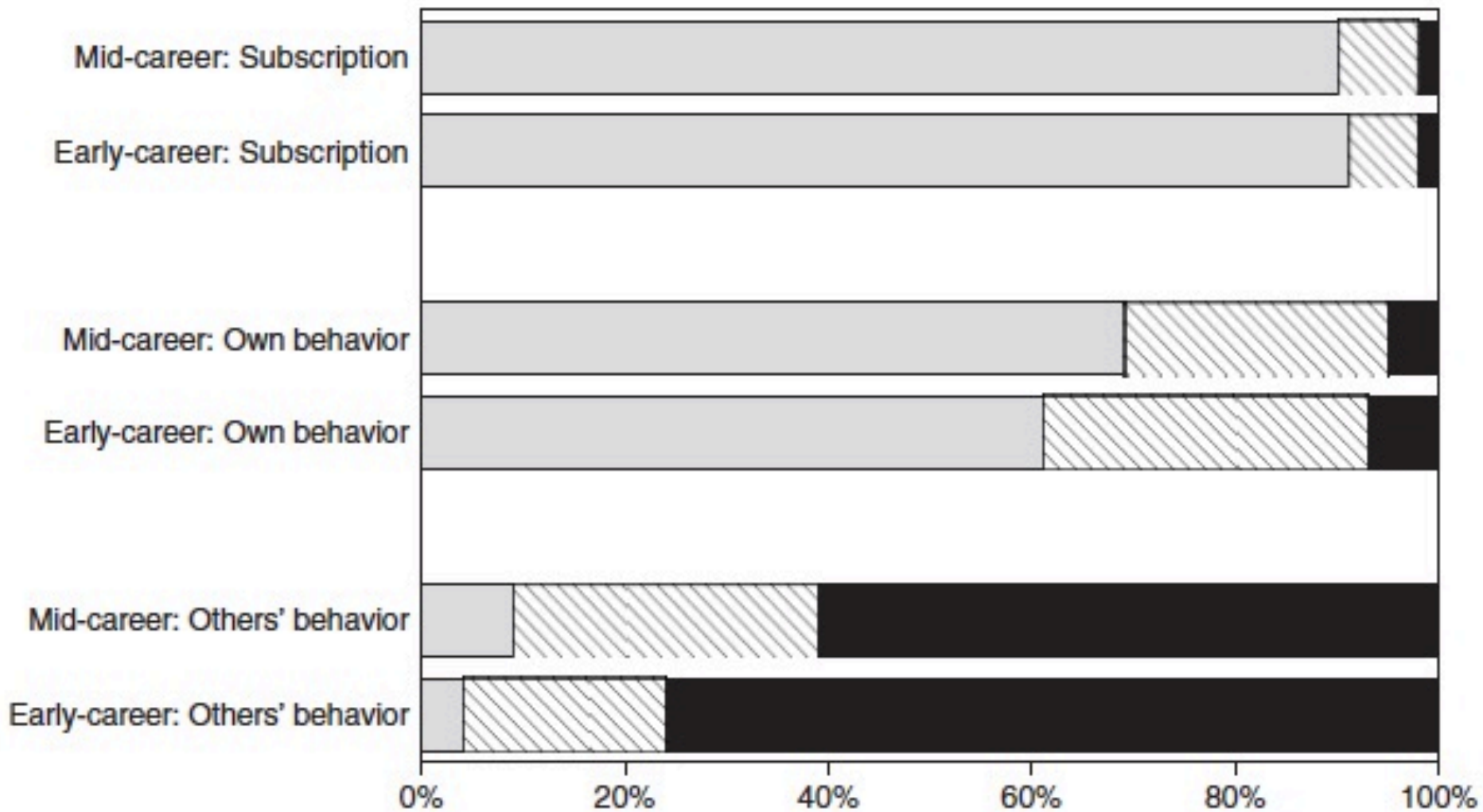
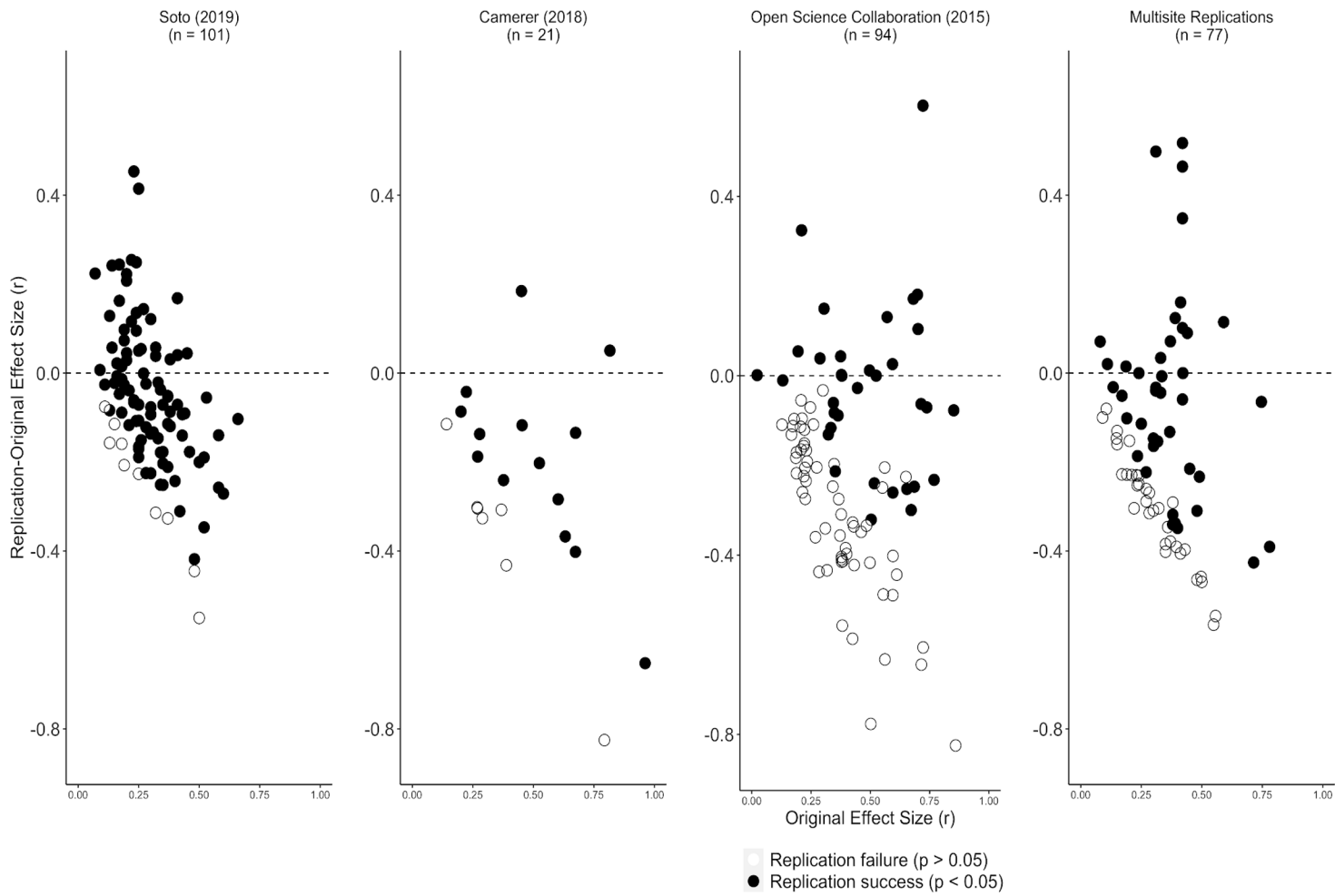


FIG. 3. Norm versus Counternorm Scores: Percent with Norm > Counternorm (dotted), Norm = Counternorm (striped), Norm < Counternorm (solid).

Incentives for
individual success are
focused on getting it
published, not
getting it right



Solutions



OPEN DATA



OPEN MATERIALS



PREREGISTERED

Good practices -> Credible results

Discovery

4 Labs

16
findings

Confirmation



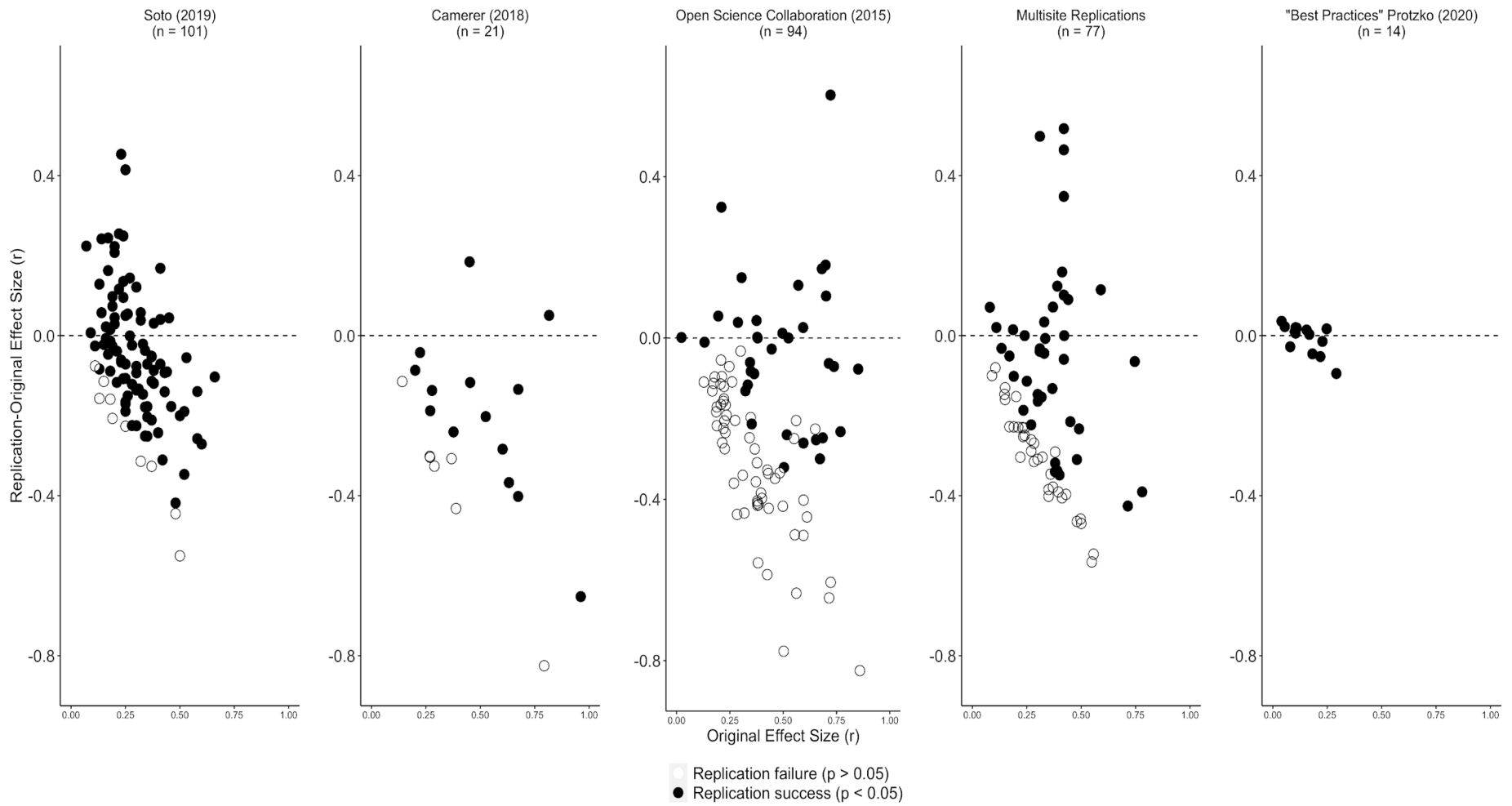
Replication



Self-Replication

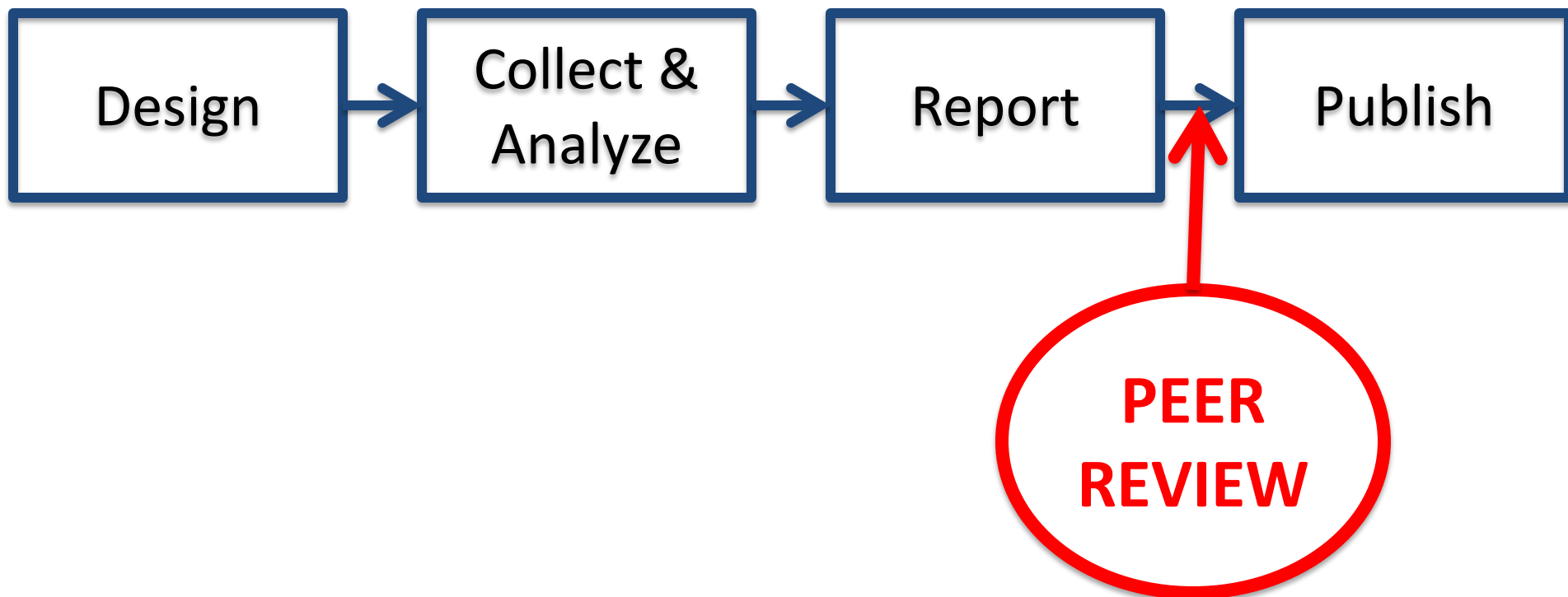
16 self-
replications

48
independent
replications



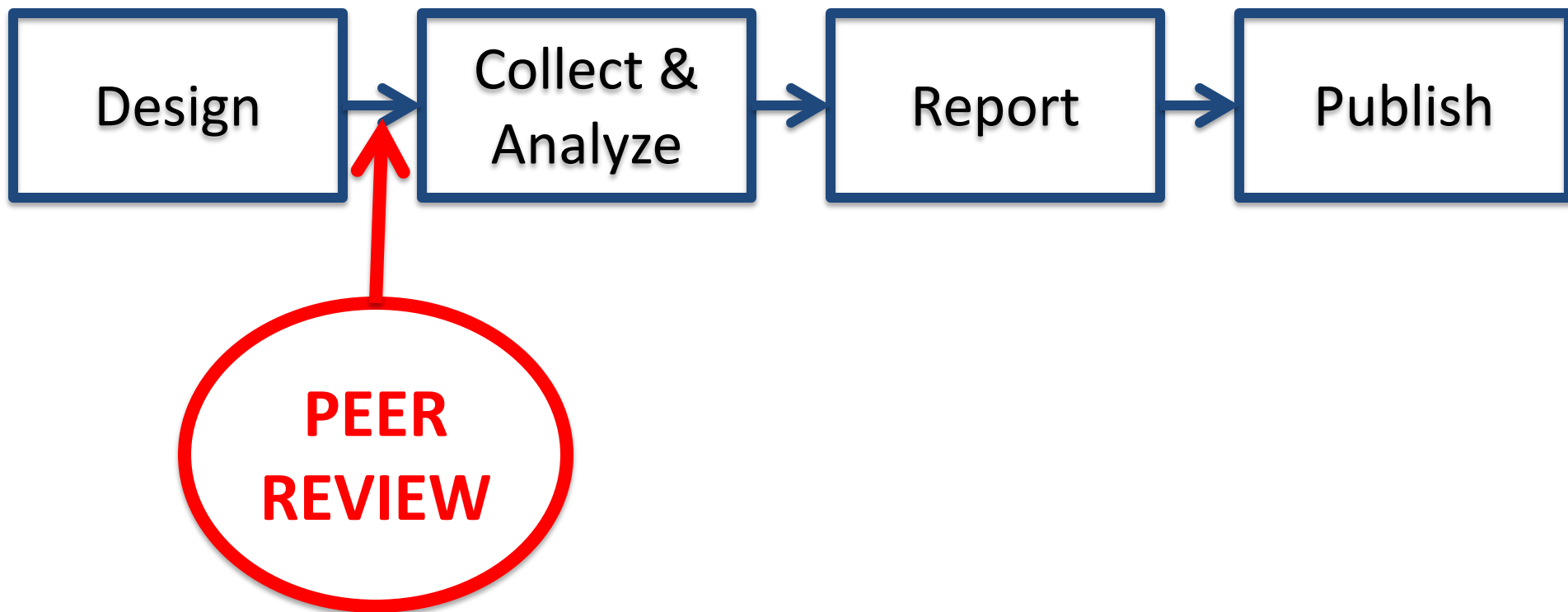
Registered Reports

<http://cos.io/rr>

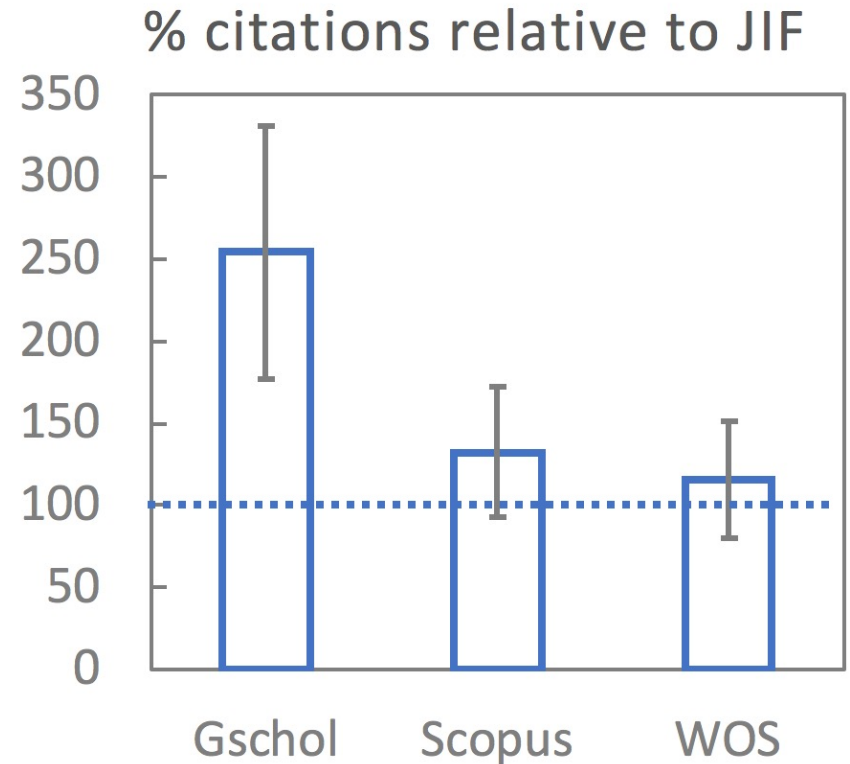
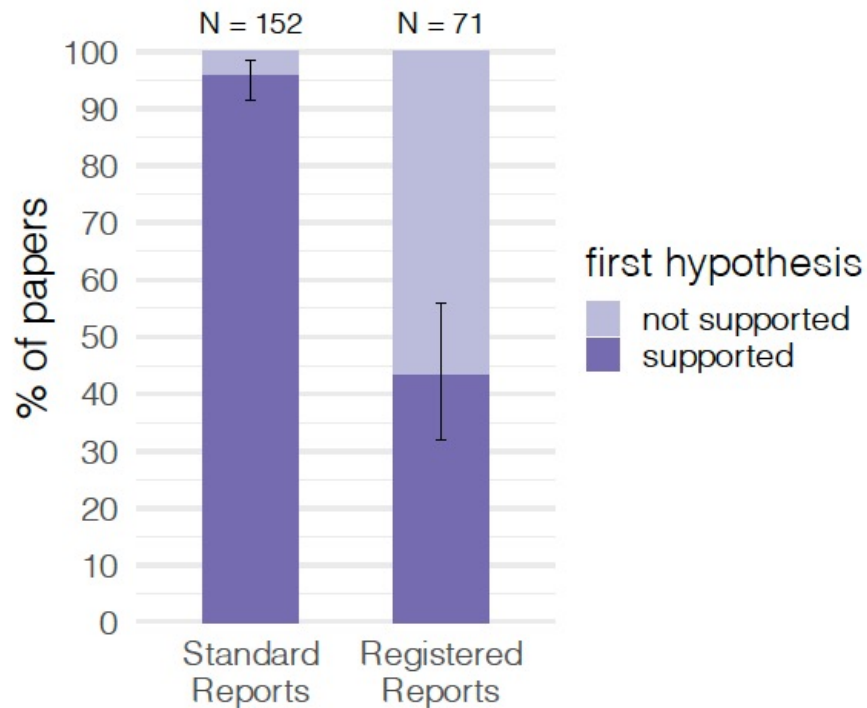


Registered Reports

<http://cos.io/rr>



Registered Reports are working as intended



More likely to discover that our hypotheses are **wrong**...

...while the articles are well cited by scientists

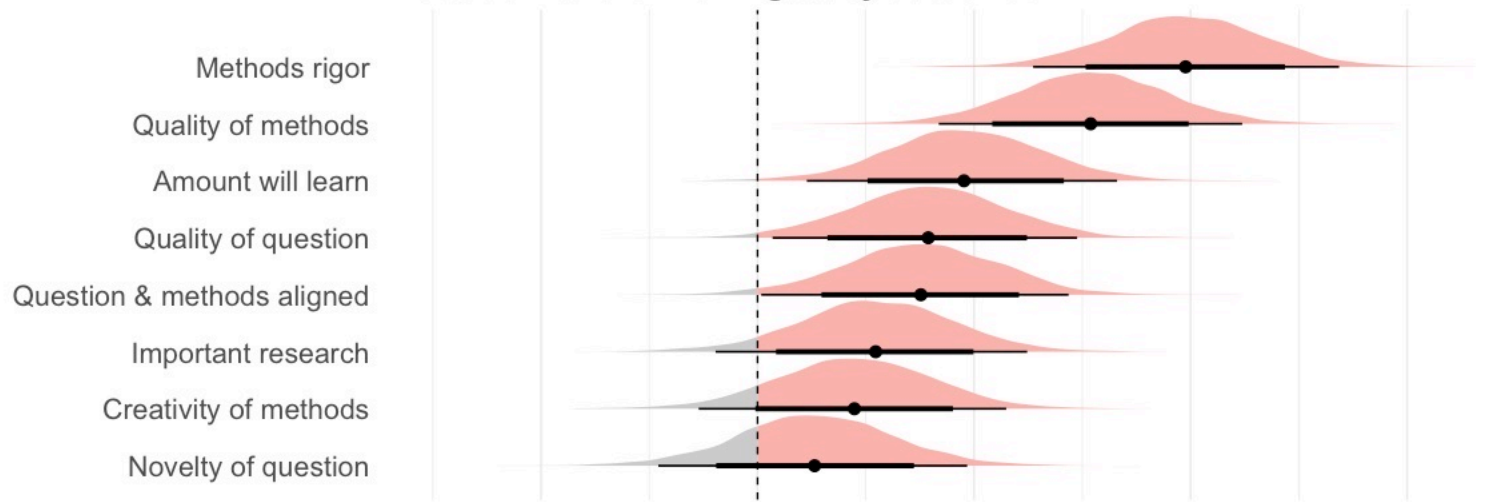
Scheel et al., 2021

<https://tinyurl.com/RR-citations>

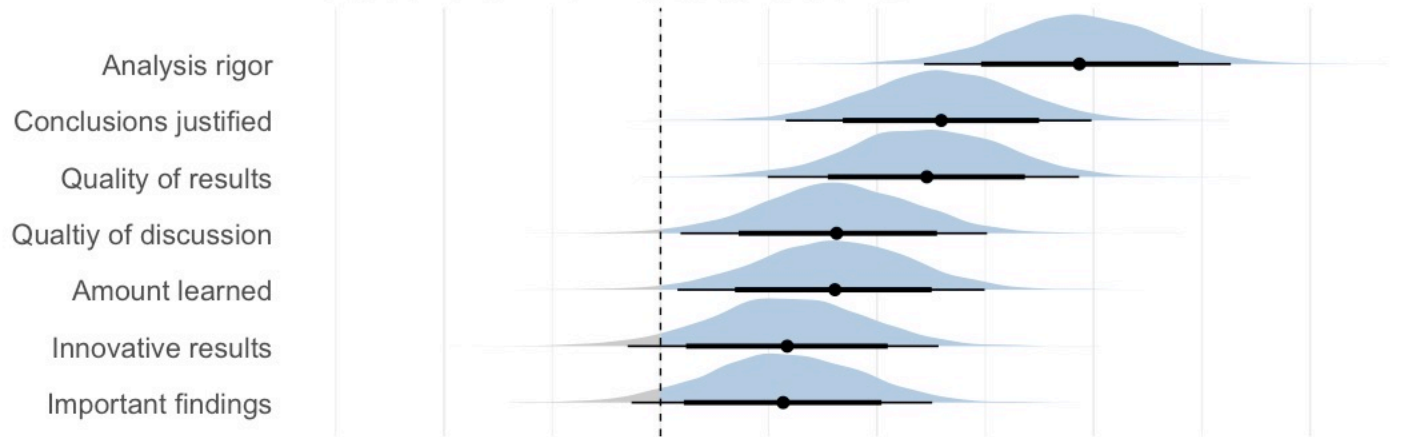
Evaluating Registered Reports

- 29 Registered Reports
- 57 comparison articles: Same topic area, 28 same lead author, 29 same journal
- 353 peer reviewers matched on relevant expertise
- 19 outcome criteria

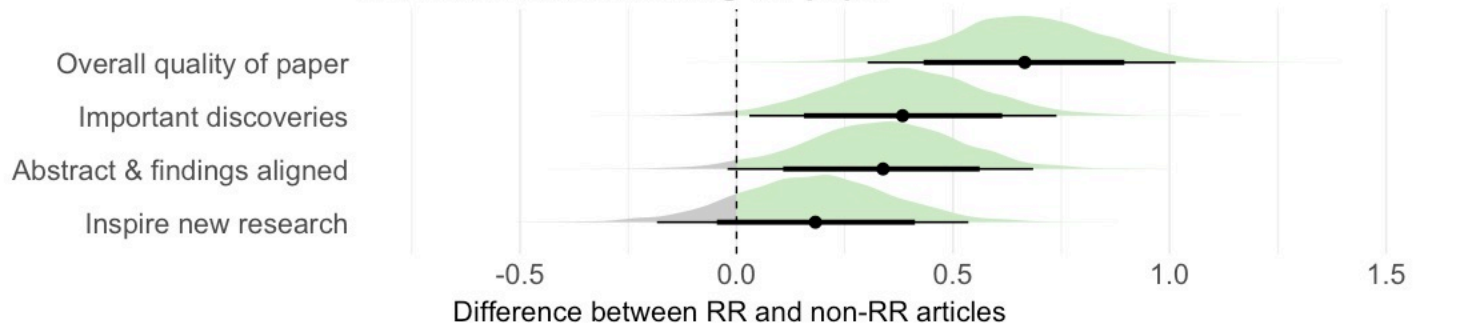
Evaluation before knowing study outcomes



Evaluation after knowing study outcomes

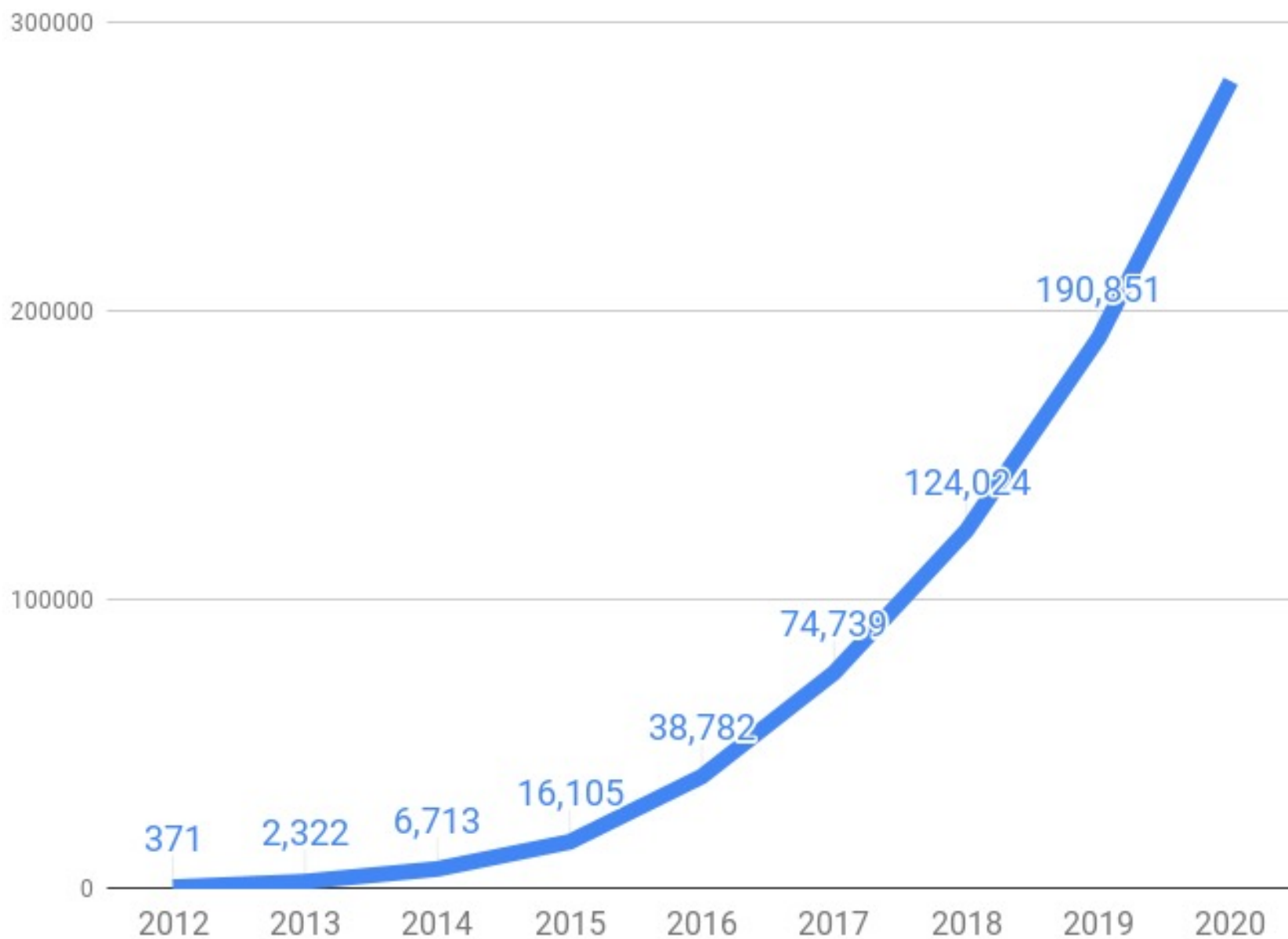


Evaluation after finishing the paper

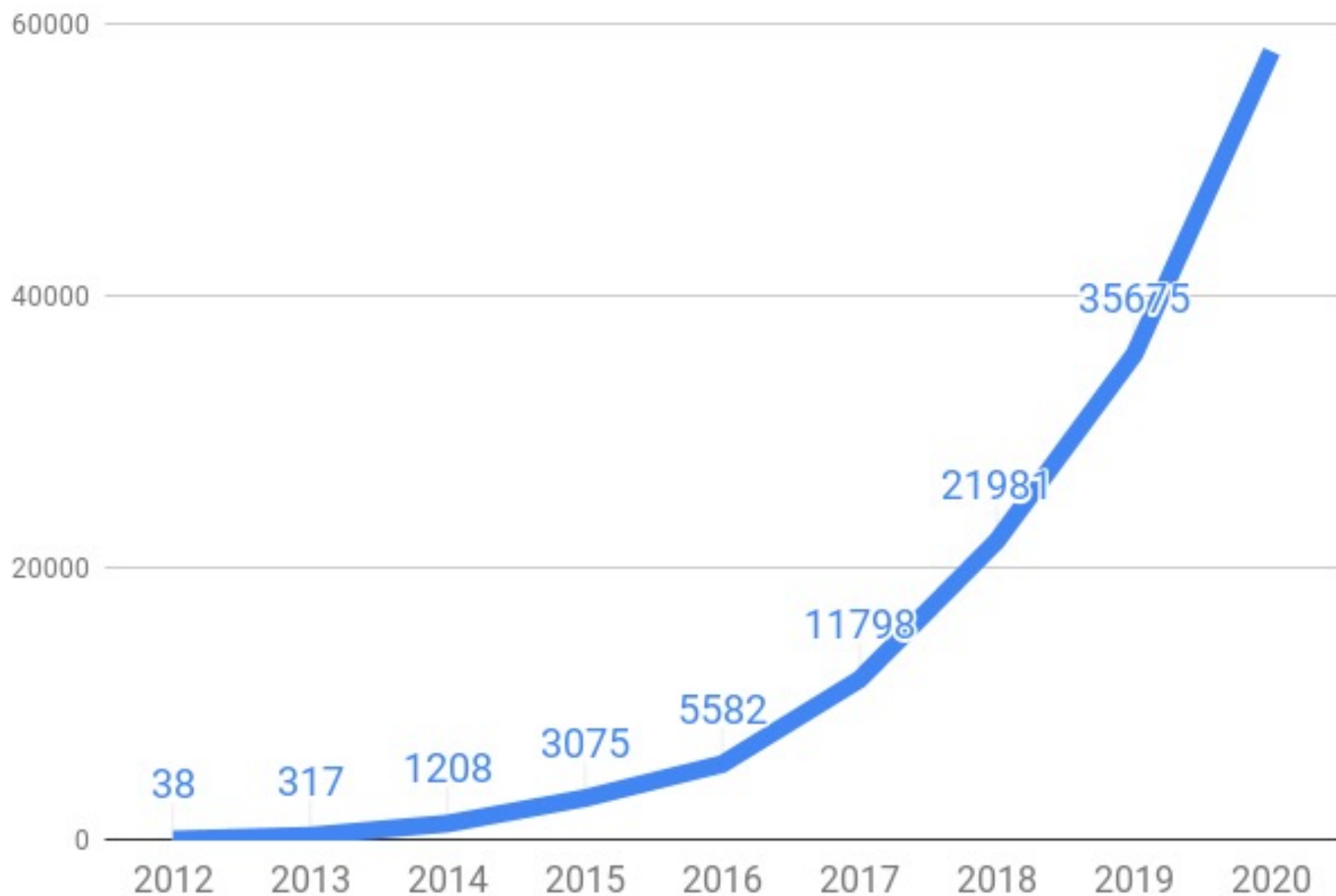


-0.5 0.0 0.5 1.0 1.5
Difference between RR and non-RR articles

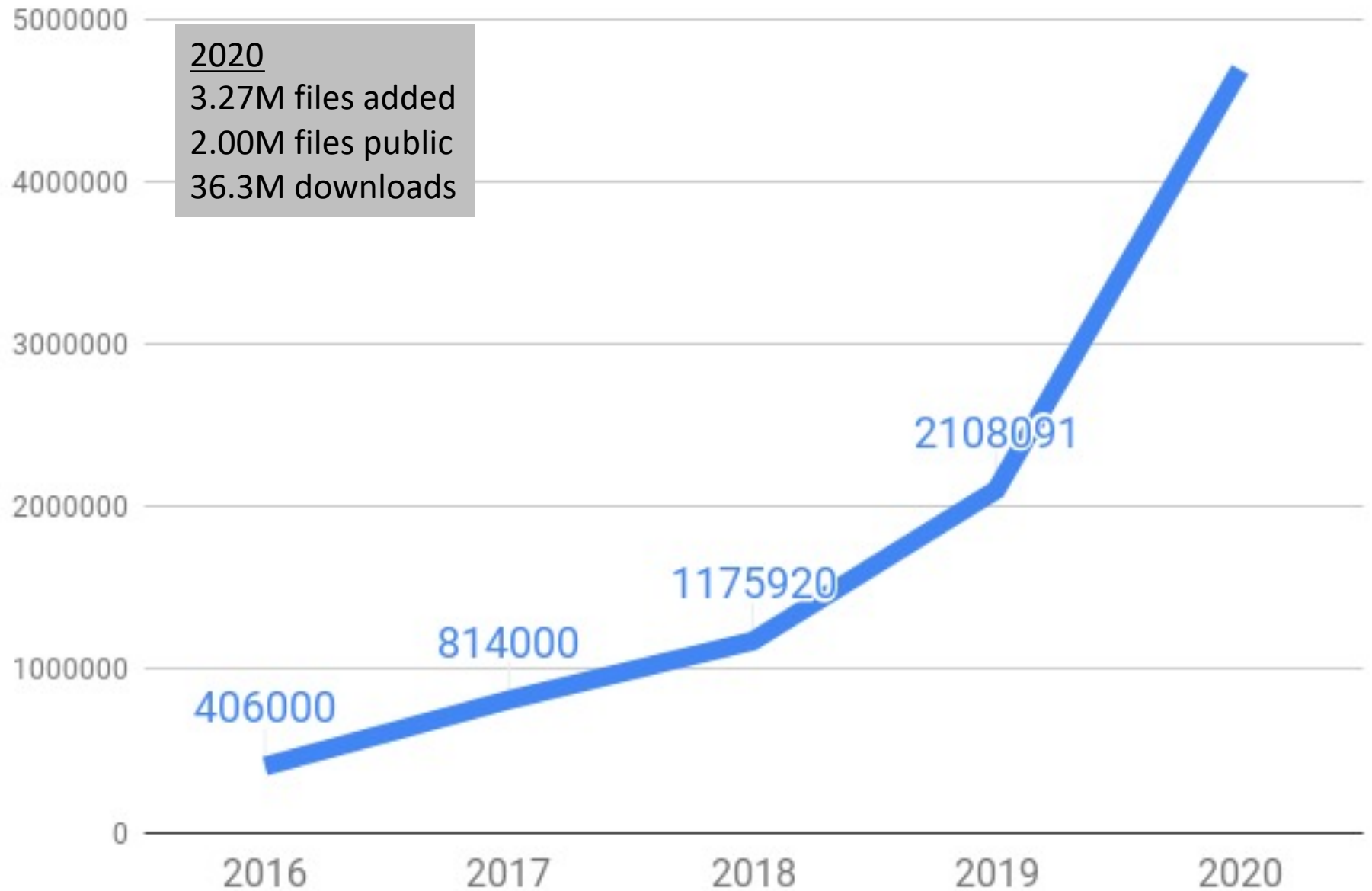
Number of Registered OSF Users



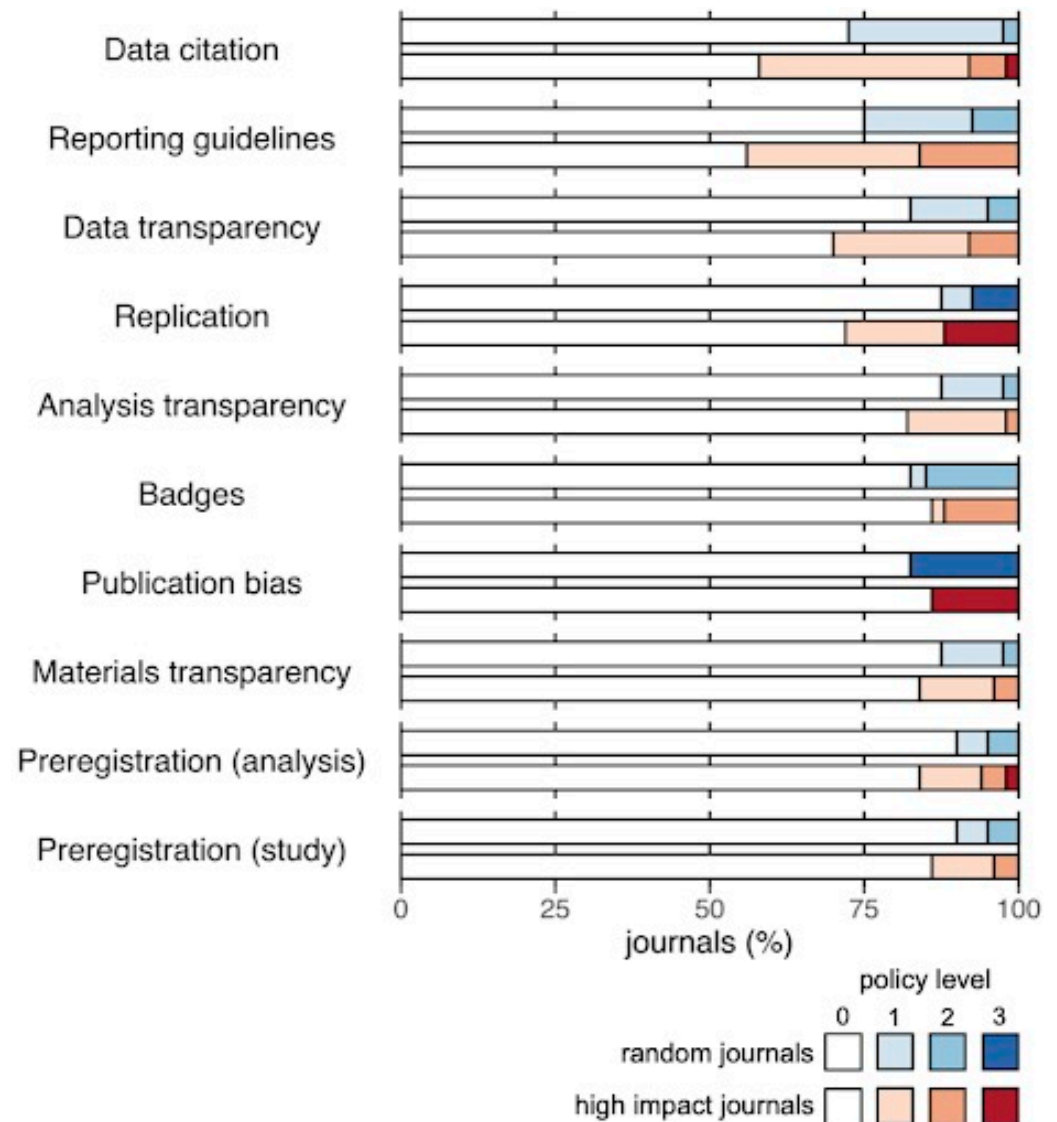
Number of OSF Study Registrations



Yearly Unique Visitors to OSF



Changing Journal Policies





Being a “good scientist”
is an exercise in
continuous self-
improvement

Embrace incrementalism

Getting Started



7 Easy Steps to Open Science – Annotated Reading List (Cruwell et al. 2019):

<https://psyarxiv.com/cfzyx/>



Replicability, Robustness, & Reproducibility (Nosek et al. 2021, *Annual Review of Psychology*): <https://psyarxiv.com/ksfvq/>



Share a preprint (Moshontz et al. 2021,

<https://psyarxiv.com/dp4x9/>)



Share data and materials (Practical tips for ethical data sharing: [Meyer, 2018](#))



Preregister a study (<http://cos.io/prereg/>)



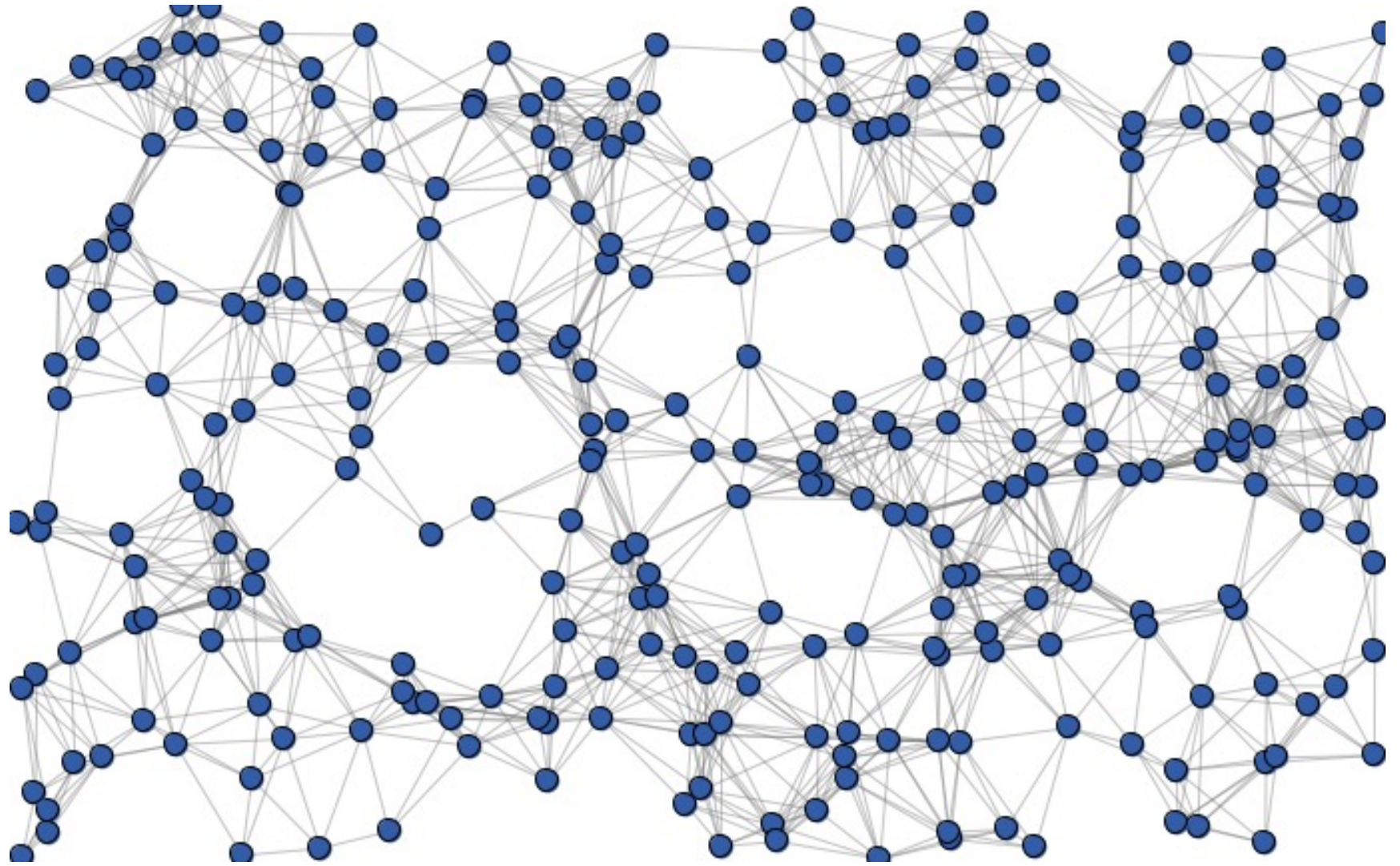
Submit a Registered Report

(<http://cos.io/rr/>)



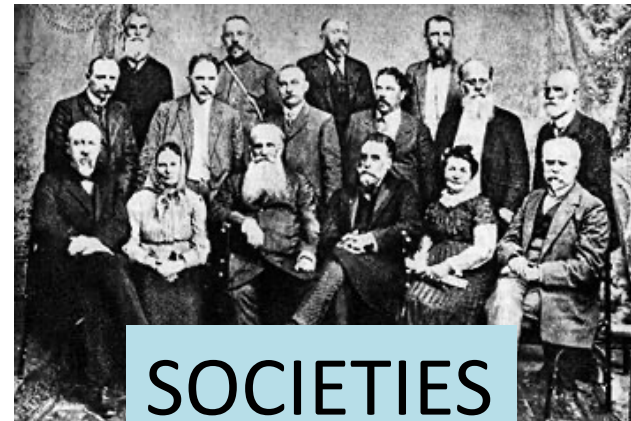
Keep Exploring for teaching and learning

(<https://www.oercommons.org/hubs/OSKB>)





ecosystem



More information

Take a picture

OSF: <http://osf.io/>

TOP Guidelines: <http://cos.io/top/>

Preregistration: <http://cos.io/prereg/>

Registered Reports: <http://cos.io/rr/>

Badges for open practices: <http://cos.io/badges/>

OSF Registries: <http://cos.io/registries/>

These slides: <https://osf.io/3ztr9/>

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Q & A Session

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**Webinar recording, slides, & transcript will be posted
within the week at:**

www.apa.org/members/your-focus/science

www.apa.org/research

APA's YouTube channel (recording only)