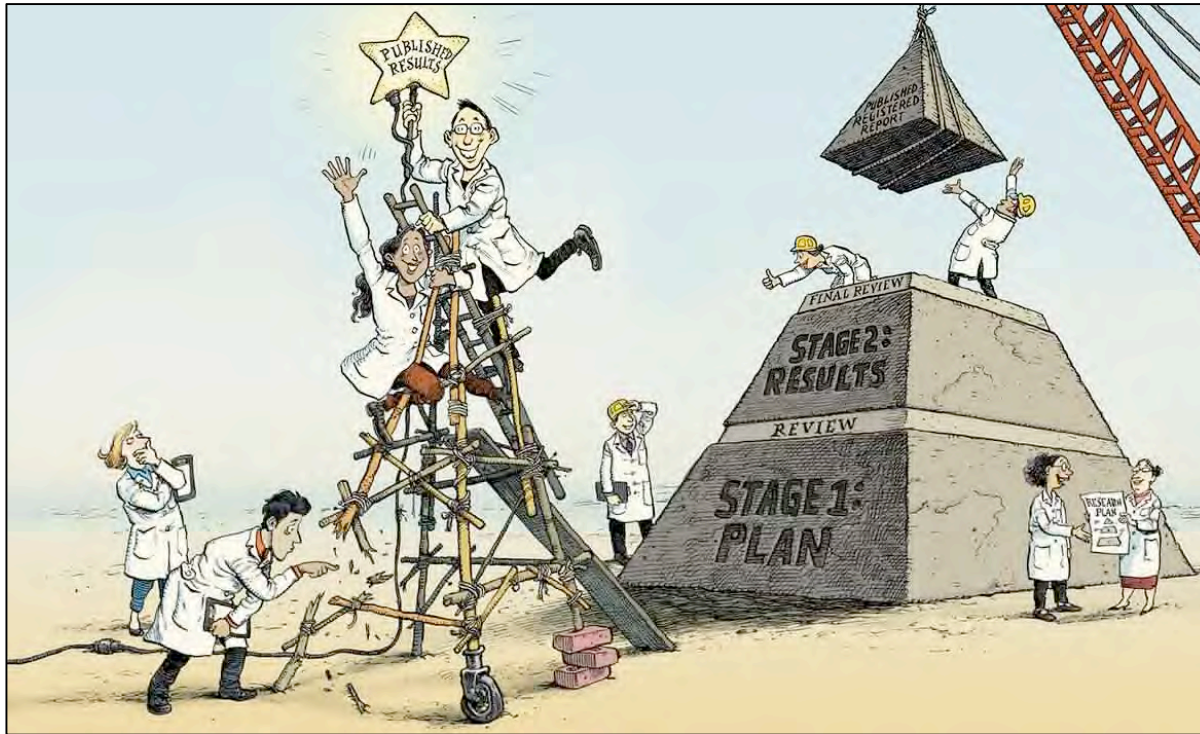


Registered Reports & PCI Registered Reports



Slides from Chris Chambers
School of Psychology, Cardiff University

A paradox

Which part of a research study do you believe should be beyond your control as a scientist?

A paradox

Which part of a research study do you believe should be beyond your control as a scientist?

The results

A paradox

Which part of a research study do you believe should be beyond your control as a scientist?

The results

Which part of a research study do you believe is most important for advancing your career?

A paradox

Which part of a research study do you believe should be beyond your control as a scientist?

The results

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The results

Don't touch THIS

Which part of a research study do you believe should be beyond your control as a scientist?



The results

Which part of a research study do you believe is most important for advancing your career?

Don't touch THIS

Which part of a research study do you believe should be beyond your control as a scientist?



The results

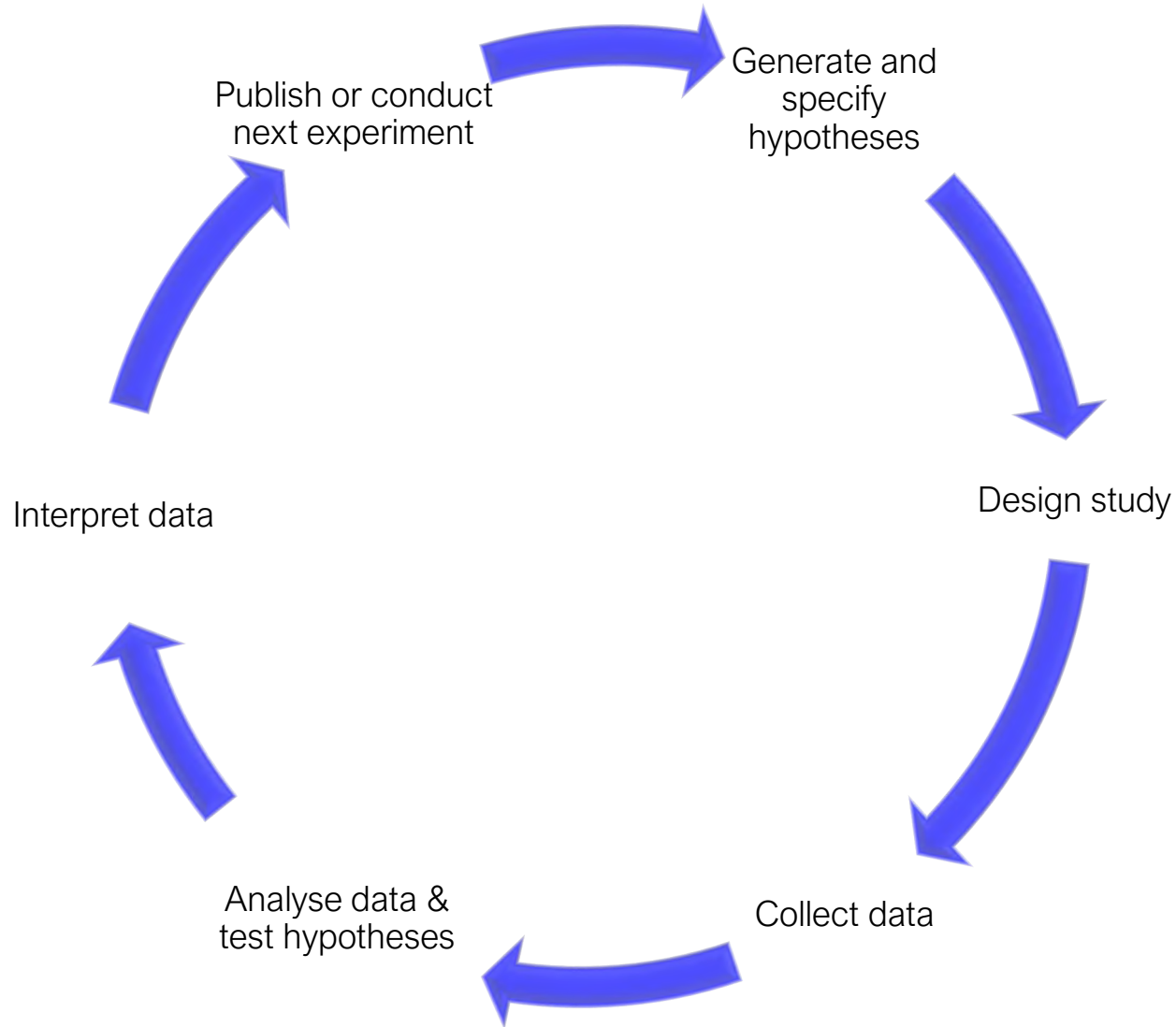
But make sure THIS is amazing

Which part of a research study do you believe is most important for advancing your career?

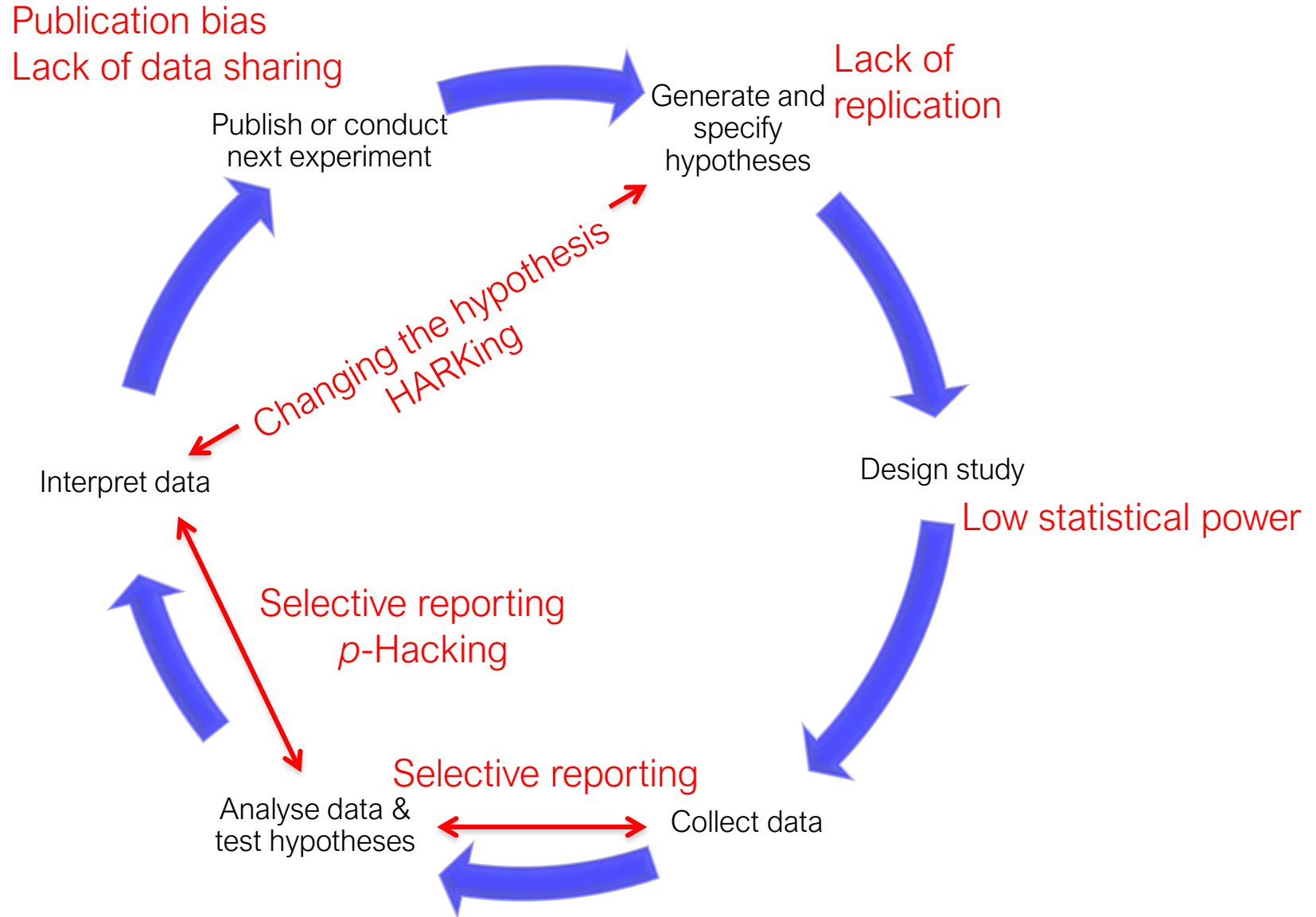


The results

Designing, running and publishing a study



What happens when we put researchers under pressure to get “great results”?



Imagine a future in which ...



- Research quality would be determined solely based on *scientific validity* (question and method), and never the **results** that studies produce
- All research of sufficient quality would enter the scientific record, organised by topic/discipline
- All publicly funded research would be free to publish and free to read, and associated with open peer review (signed or anonymous)
- Journals and academic publishers would exist only to editorialize studies of note, not as curators of science or “managers” of peer review that “add value” by extracting billions in profits from (our) labour

Academic pipe-dream?

**Chris Chambers et al. and PCI
already started building it**

Registered Reports 1.0

CORTEX 49 (2013) 609–610



Available online at www.sciencedirect.com

SciVerse ScienceDirect

Journal homepage: www.elsevier.com/locate/cortex



Editorial

Registered Reports: A new publishing initiative at Cortex

Christopher D. Chambers

Cardiff University Brain Research Imaging Centre (CUBRIC), School of Psychology, Cardiff University, United Kingdom

Four central aspects of the Registered Reports model:

- Researchers decide hypotheses, study procedures, and main analyses *before* data collection
- Part of the peer review process takes place before studies are conducted
- Passing this stage of review virtually guarantees publication
- Original studies and high-value replications are welcome

How it works

Authors submit **STAGE 1** manuscript with Introduction, Proposed Methods & Analyses, and Pilot Data (if applicable)



Stage 1 peer review

Reviewers assess validity of research question and rigour of the methodology according to specific criteria



If reviews are positive then journal offers **in-principle acceptance (IPA)**, regardless of study outcome
(protocol archived)

How it works

Authors do the research



Authors resubmit completed **STAGE 2** manuscript:

- **Introduction** and **Methods** (virtually unchanged)
- **Results (new)**: Registered confirmatory analyses + unregistered exploratory analyses
- **Discussion (new)**
- **Data and materials deposited in a public archive**



Stage 2 peer review



Manuscript published!

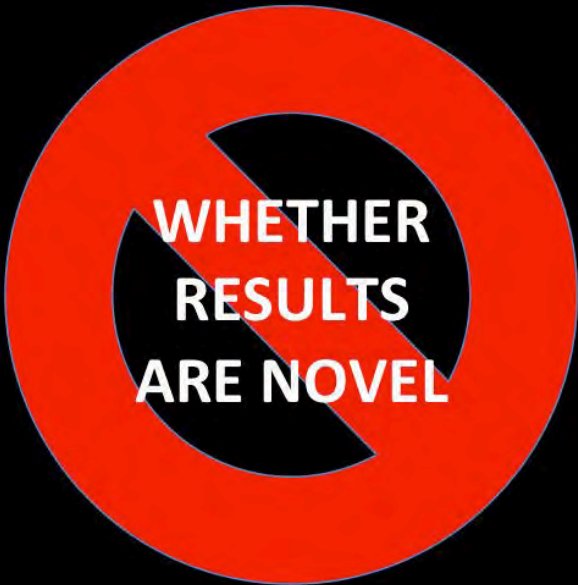
Reviewers assess compliance with study protocol, whether pre-specified quality checks were passed, and whether conclusions are evidence-based



**WHETHER
HYPOTHESIS
SUPPORTED**



**WHETHER
 $p < .05$**



**WHETHER
RESULTS
ARE NOVEL**

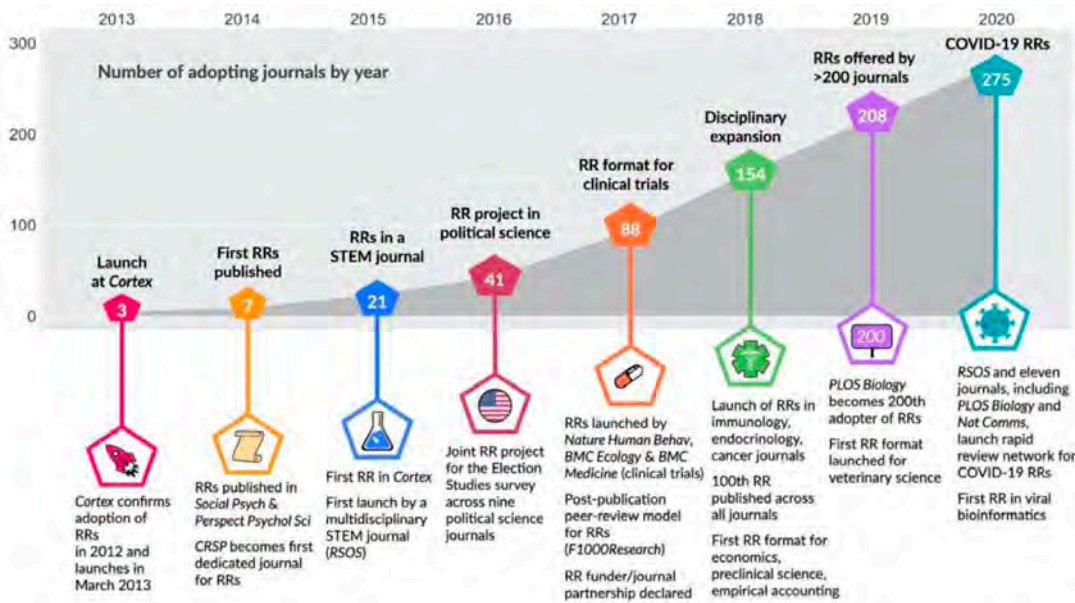


**WHETHER
RESULTS
HAVE
"IMPACT"**

Ten years later...

Registered Reports are now mainstream

- **Over 350** journals have adopted them so far
- Fields covered
 - **Life/medical sciences:** neuroscience, nutrition, psychology, psychiatry, biology, botany, cancer research, ecology, endocrinology, clinical medicine, preclinical science, veterinary science, agricultural & soil sciences
 - **Social sciences:** education, political science, economics, finance and accounting research
 - **Physical sciences:** chemistry, physics, computer science



>800 fully completed RRs have been published so far



Chambers, C. D., & Tzavella, L. (2022). The past, present, and future of Registered Reports. <https://www.nature.com/articles/s41562-021-01193-7>

But they aren't perfect. 5 known limitations include:

1. Stage 1 review time
2. Not well suited to programmatic research where one Stage 1 protocol could lead to multiple Stage 2 outputs (current model is one S1 → one S2)
3. Inconsistent editorial standards and levels of training/experience
4. Unclear policies on applicability of RRs for analysis of existing data
5. Power resides with journals and (largely for-profit) publishers to shape RR policies and practices, not with authors and the broader scientific community

**Fixing these problems requires taking Registered
Reports ABOVE and BEYOND journals**

Peer Community in

PCI, a free recommendation process of scientific preprints based on peer reviews and a journal



**Discipline *non-specific*
Registered Reports only**

- PCI Animal Science
- PCI Archaeology
- PCI Evolutionary Biology
- PCI Ecology
- PCI Ecotoxicology and Environmental Chemistry
- PCI Forest & Wood Sciences
- PCI Genomics
- PCI Health & Movement Sciences
- PCI Infections
- PCI Mathematical & Computational Biology
- PCI Microbiology
- PCI Network Science
- PCI Neuroscience
- PCI Organization Studies
- PCI Paleontology
- PCI Zoology



**Discipline-specific
Standard
reports/preprints
only**



Free and transparent pre- and post-study
recommendations across research fields



Founders: Corina Logan, Emily Sena, Zoltan Dienes, Chris Chambers, Ben Pujol

Web: <https://rr.peercommunityin.org/>

Twitter: [@PCI_RegReports](https://twitter.com/PCI_RegReports)

Email: contact@rr.peercommunityin.org

- [Peer Community in Registered Reports](https://rr.peercommunityin.org/) (PCI RR) is a free, non-commercial platform dedicated to reviewing and recommending Registered Reports *preprints* across STEM, medicine, the social sciences and humanities
- Once a submission is recommended by PCI RR following peer review, the revised manuscript is posted at the preprint server where the preprint is hosted, and the peer reviews and recommendation are published at the PCI RR website
- Authors then have the option to publish the preprint in *Peer Community Journal* or in a traditional journal, including a growing list of [PCI RR-friendly journals](#) that have committed to accepting PCI RR recommendations *without further peer review*



There are current lists of journals in spreadsheet and PDF format, and details of each journal are available in the links below.

For open access journals, there is a dedicated website for latest information concerning article processing charges.

Journals interested in becoming PCI RR

- [Addiction Research & Theory](#)
- [Advances in Cognitive Psychology](#)
- [Advances in Methods and Practices in Psychology](#)
- [Biollinguistics](#)
- [Brain and Neuroscience Advances](#)
- [Cambridge Educational Research e-Journal](#)
- [Collabra: Psychology](#)
- [Communications in Kinesiology](#)
- [Cortex](#)
- [Experimental Psychology](#)
- [F1000Research](#)
- [Human Population Genetics and Genomics](#)
- [Imaging Neuroscience](#)
- [In&Vertebrates](#)
- [Infant and Child Development](#)
- [International Review of Social Psychology](#)
- [Journal for Reproducibility in Neuroscience](#)
- [Journal of Cognition](#)
- [Meta-Psychology](#)
- [NeuroImage: Reports](#)
- [Peer Community Journal](#)
- [PeerJ](#)
- [PeerJ Computer Science](#)
- [PeerJ Physical Chemistry](#)
- [PeerJ Organic Chemistry](#)
- [PeerJ Inorganic Chemistry](#)
- [PeerJ Analytical Chemistry](#)
- [PeerJ Materials Science](#)
- [Psychology of Consciousness: Theory, Research, and Practice](#)
- [Royal Society Open Science](#)
- [Social Psychological Bulletin](#)
- [Studia Psychologica](#)
- [Swiss Psychology Open](#)
- [WiderScreen](#)



Peer Community In

Free and transparent pre- and post-study recommendations across research fields

Registered Reports

List of



Where authors recommend they accept a PCI RR review, the evidence strength

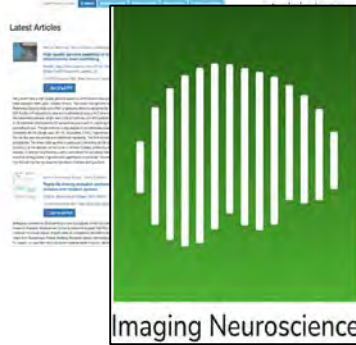
is provided by the PCI RR

picked up by a PCI RR-interested journal, we recommend that authors should meet conditions that may need to be met, over and above the more stringent requirement on pre-planned statistical power or Bayes factors) while others may only consider RRs where data do not exist prior to in-principle acceptance (in line with [Level 6 of the PCI RR bias-control taxonomy](#)).

The list of PCI RR-interested outlets below includes a link to each journal's RR author guidelines.

- [i-Perception \[RR author guidelines\]](#)
- [Journal of Experimental Psychology: Learning, Memory, and Cognition \[RR author guidelines\]](#)
- [Nature Human Behaviour \[RR author guidelines\]](#)
- [Perception \[RR author guidelines\]](#)
- [PLOS Biology \[RR author guidelines\]](#)
- [Psychology of Addictive Behaviors \[RR author guidelines\]](#)
- [Sport, Exercise, and Performance Psychology \[RR author guidelines\]](#)

Peer Community Journal



PCI RR-friendly journals commit to accepting PCI RR recommendations without further peer review. **Authors decide which journal gets to publish their Stage 2 RR**

https://rr.peercommunityin.org/about/pci_rr_friendly_journals



Free and transparent pre- and post-study recommendations across research fields

Other unique features

Programmatic RRs: One Stage 1 manuscript leading to multiple Stage 2 outputs

See: https://rr.peercommunityin.org/help/guide_for_authors#h_52492857233251613309610581

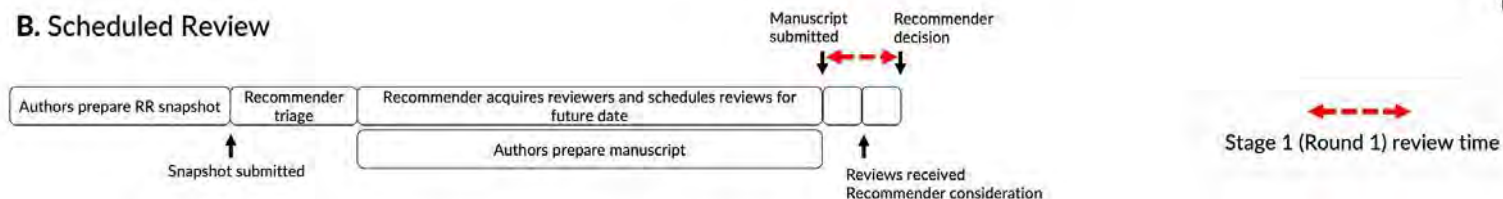
Scheduled Review: Following submission of a one-page Stage 1 “snapshot”, peer review is scheduled in advance so that the Stage 1 review time following full manuscript submission = days rather than weeks

See: https://rr.peercommunityin.org/help/guide_for_authors#h_61998243643551613309672490

A. Standard Review



B. Scheduled Review



Recent example of a programmatic scheduled submission

The screenshot shows a Peer Community In (PCI) RR recommendation page. At the top, there is a blue header with the PCI logo and the word "Recommendation". Below this, there are social media sharing options for Facebook, Twitter, and a "Printable page" link. The main title of the recommendation is "Neurocognitive insights on instructed extinction in the context of pain", written by Chris Chambers, based on reviews by Tom Beckers, Gaëtan Mertens, and Karita Ojala. It is noted as a recommendation of a Stage 1 submission titled "Modulatory effects of instructions on extinction efficacy in appetitive and aversive learning: A registered report" by Busch et al. (2023). The submission was posted on 15 October 2022, and the recommendation was posted on 13 July 2023, with a validated date of 13 July 2023. The recommendation text discusses the importance of rapid learning in response to pain and the current programmatic submission by Busch et al. (2023), which will undertake two Registered Reports to test a verbal instruction intervention. The Stage 1 manuscript was evaluated over two rounds of in-depth review and was awarded in-principle acceptance (IPA). A list of eligible PCI RR-friendly journals is provided at the bottom, including Advances in Cognitive Psychology, Brain and Neuroscience Advances, Cortex, Experimental Psychology, iObResearch, Imaging Neuroscience, InMammbrates, Journal of Cognition, NeuroImage Reports, Peer Community Journal, PLoS, Royal Society Open Science, and Swiss Psychology Open.

Two Stage 2 RRs from one Stage 1 protocol:

- Behavioural (study 1)
- Neuroimaging (study 2)

Three expert reviewers provided detailed feedback over two rounds of in-depth evaluation

Review duration for the Stage 1

Round 1 (scheduled 8 weeks in advance): 9 days

Round 2 (standard): 28 days

Round 3 (desk evaluation): 7 days

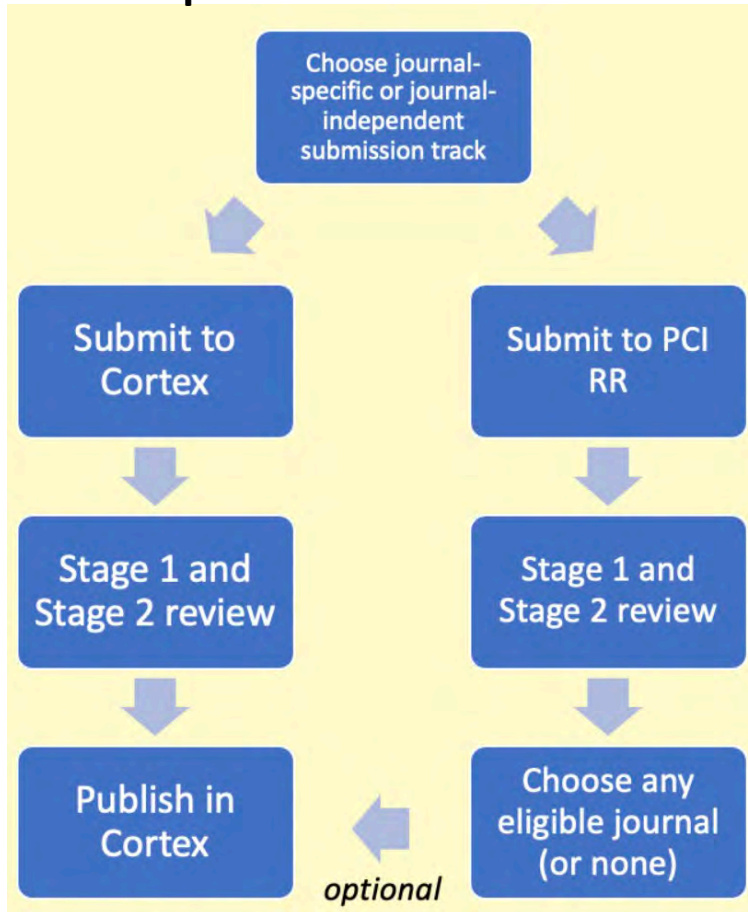
Total time in Stage 1 review: ~6 weeks

<https://rr.peercommunityin.org/articles/rec?id=327>

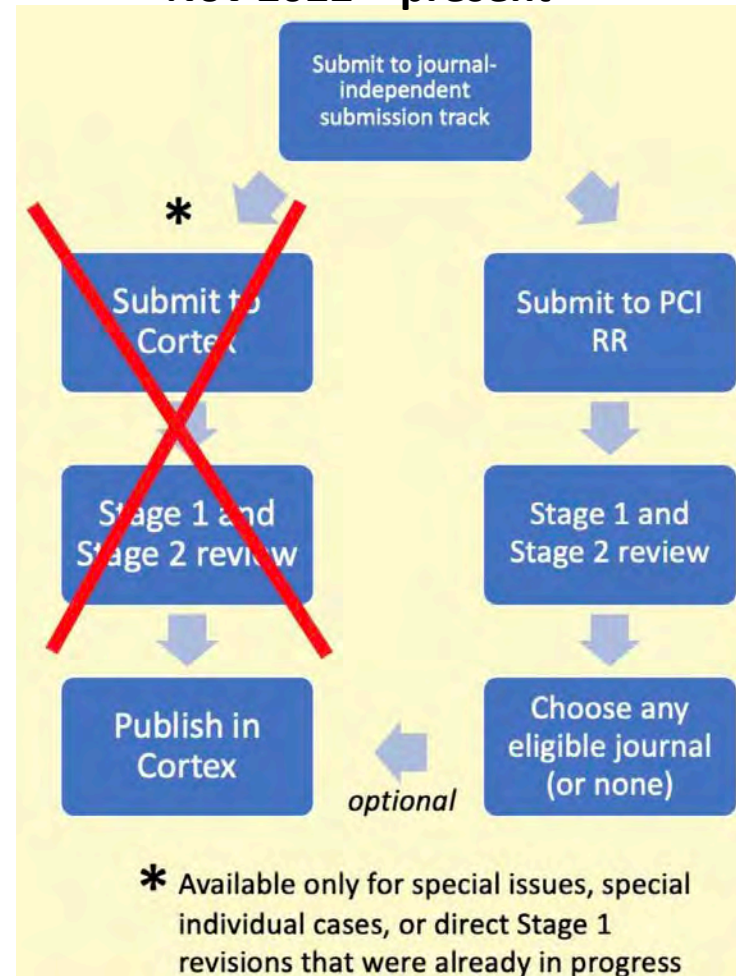
Taking Registered Reports FAR BEYOND journals

Going further: *Replacing* journal-based RR review with PCI RR

Apr 2021 – Nov 2022



Nov 2022 – present



Further information about PCI RR

Guide for Authors https://rr.peercommunityin.org/help/guide_for_authors

General Information <https://rr.peercommunityin.org/about/about>

FAQs <https://rr.peercommunityin.org/help/faq>

Information for adopting journals https://rr.peercommunityin.org/about/become_journal_adopter

~400 submissions so far

Stage 1 and Stage 2
recommendations →

<https://rr.peercommunityin.org>



Psychology, neuroscience,
economics, ecology, public
health, law

Quantitative and qualitative
studies

All with open review

**Merci pour votre
attention!**

Example: post doc or PhD student planning to do a series of independent RRs

1. Design RRs and complete Stage 1 Snapshot



2. Post Snapshot on the OSF, either publicly or under private embargo



3. Submit the snapshot URL to PCI RR via the "Scheduled Review" track



4. Select future date for review (e.g. 8 weeks ahead), and once passed the recommender triage process, set to work writing a full "programmatic RR"



5. While designing & writing the Stage 1 RR, consult the list of PCI RR-friendly journals to ensure that you meet any additional requirements for whatever target journals you have in mind (e.g. concerning evidence strength, bias control, etc)



6. Submit your full Stage 1 manuscript by the due date. Because review is planned in advance, reviews & an interim recommendation can be expected in ~2 weeks

7. If, likely following revision, you gain in-principle acceptance (IPA), **PCI RR will tell you which journals are eligible outlets** and will auto-endorse the IPA decision. You can also ask us for a provisional steer prior to IPA. PCI RR makes this decision.

8. With IPA in hand, you now have an approved programme of multiple Stage 2 RRs accepted in advance which you can eventually choose to publish in any eligible PCI RR-friendly journal (or you can submit anywhere else as you see fit). Each Stage 2 RR can go in a different journal.

9. Do research and publish each Stage 2 output as you go without further peer review, in journal of your choice

Are Registered Reports working as intended?

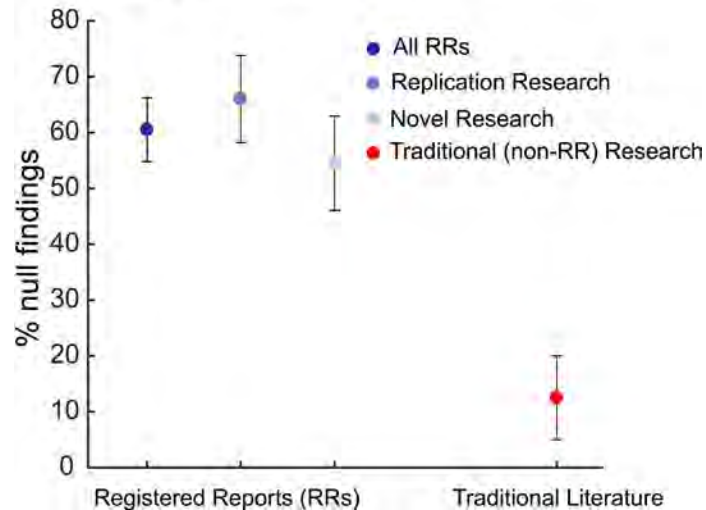
NEWS • 24 OCTOBER 2018

First analysis of 'pre-registered' studies shows sharp rise in null findings

Logging hypotheses and protocols before performing research seems to work as intended: to reduce publication bias for positive results.

Matthew Warren

Percentage of null findings



Hypotheses are ~5 times more likely to be **unsupported** in Registered Reports compared with regular articles

Allen C, Mehler DMA (2019) Open science challenges, benefits and tips in early career and beyond. PLOS Biol 17(5): e3000246. <https://doi.org/10.1371/journal.pbio.3000246>

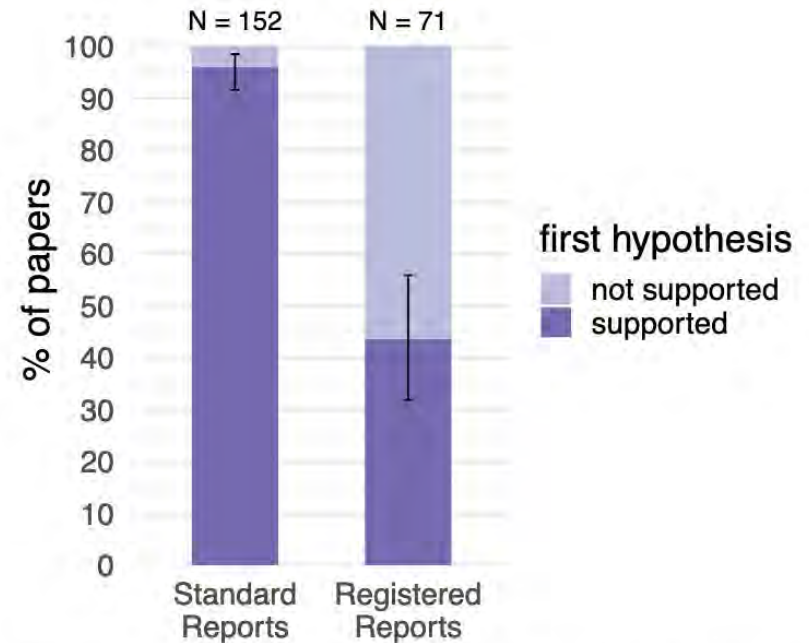


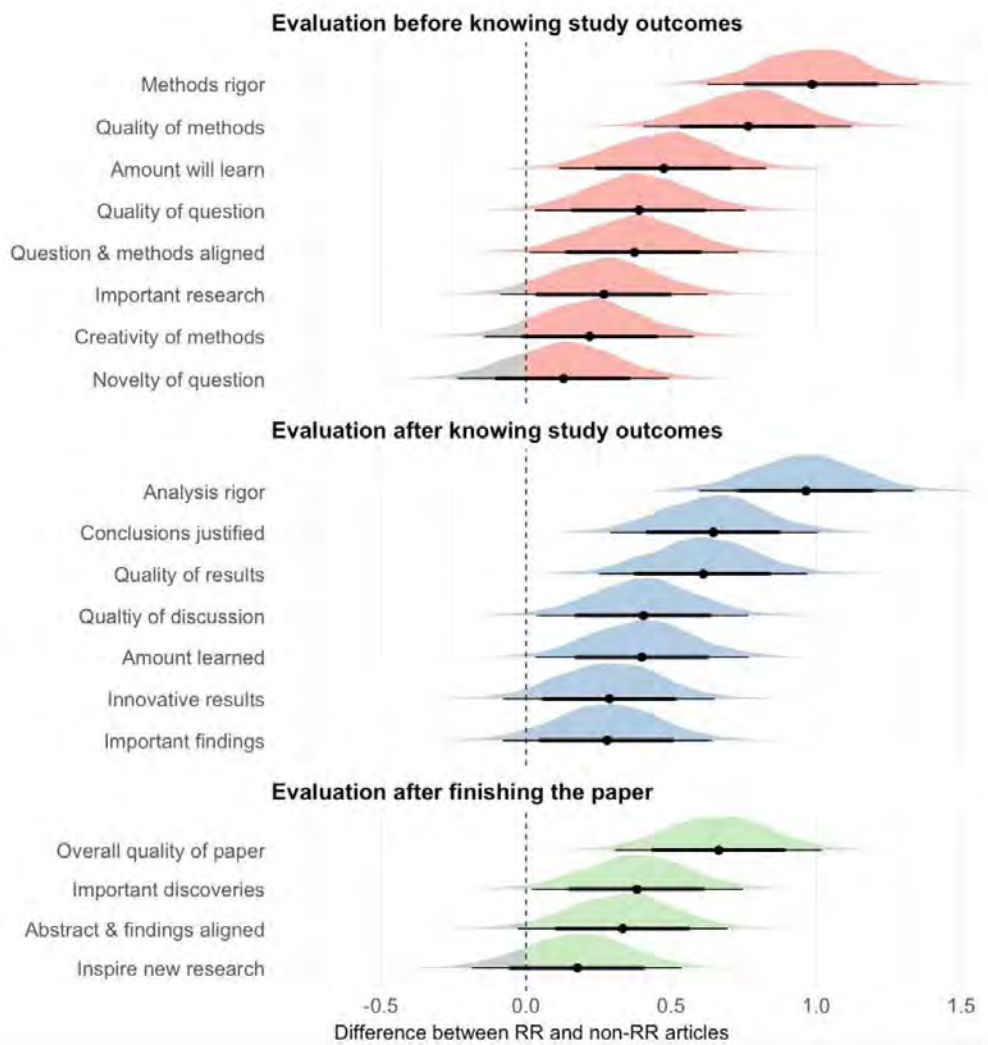
Figure 2. Positive result rates for standard reports and Registered Reports. Error bars indicate 95% confidence intervals around the observed positive result rate.

Same observation in RRs within psychology specifically

Scheel, Schijen & Lakens (2021)

<https://journals.sagepub.com/doi/full/10.1177/25152459211007467>

Are Registered Reports working as intended?



ARTICLES

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

nature
human behaviour

Check for updates

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. Schiavone², Julia Bottesini², Felix Singleton Thorn², Simine Vazire^{2,3}, Kevin M. Esterling⁴ 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.

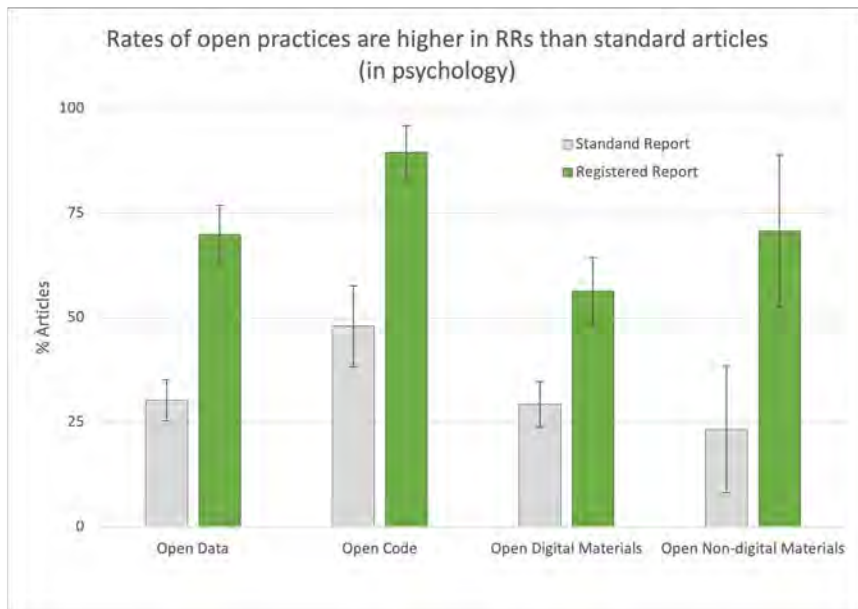
Soderberg, C. K., Errington, T. M., Schiavone, S. R., Bottesini, J. G., Singleton Thorn, F., Vazire, S., ... Nosek, B. A. (2021). Initial evidence of research quality of registered reports compared with the standard publishing model. *Nature Human Behaviour* <https://doi.org/10.1038/s41562-021-01142-4>

Well cited – on average, cited same or slightly higher than regular articles

See Hummer, L. T., Singleton Thorn, F., Nosek, B. A. & Errington, T. M. Preprint:

<https://doi.org/10.31219/osf.io/5y8w7>

Are Registered Reports working as intended?



Analysis of 170 RRs and 340 standard reports in psychology
From O'Mahony et al. (in preparation)

Advances in Methods and Practices in Psychological Science
Volume 7, Issue 2, June 2020, Pages 229-237
© The Author(s) 2020, Article reuse guidelines:
<https://doi.org/10.1177/2515245920918872>

SAGE
journals

General Article

Analysis of Open Data and Computational Reproducibility in Registered Reports in Psychology

Pepijn Obels¹, Daniel Lakens¹, Nicholas A. Coles², Jaroslav Gottfried³, and Seth A. Green⁴

Abstract

Ongoing technological developments have made it easier than ever before for scientists to share their data, materials, and analysis code. Sharing data and analysis code makes it easier for other researchers to reuse or check published research. However, these benefits will emerge only if researchers can reproduce the analyses reported in published articles and if data are annotated well enough so that it is clear what all variable and value labels mean. Because most researchers are not trained in computational reproducibility, it is important to evaluate current practices to identify those that can be improved. We examined data and code sharing for Registered Reports published in the psychological literature from 2014 to 2018 and attempted to independently computationally reproduce the main results in each article. Of the 62 articles that met our inclusion criteria, 41 had data available, and 37 had analysis scripts available. Both data and code for 36 of the articles were shared. We could run the scripts for 31 analyses, and we reproduced the main results for 21 articles. Although the percentage of articles for which both data and code were shared (36 out of 62, or 58%) and the percentage of articles for which main results could be computationally reproduced (21 out of 36, or 58%) were relatively high compared with the percentages found in other studies, there is clear room for improvement. We provide practical recommendations based on our observations and cite examples of good research practices in the studies whose main results we reproduced.

Computational reproducibility of RRs:
58% (compared to 31% in regular literature)

Room to improve!

Level-based taxonomy of bias control due to prior data observation:

https://rr.peercommunityin.org/help/guide_for_authors#h_95790490510491613309490336

Level	Data already exist or will exist prior to IPA	Data are accessible to the authors	Data have been accessed by the authors	At least some data have already been observed by the authors	Key variables in the data have been observed by the authors	Authors have already analysed key variables in the data	Risk of bias due to prior data observation	Multi-disciplinary inclusivity
6	<i>Level 6 description:</i> No part of the data or evidence that will be used to answer the research question yet exists and no part will be generated until after IPA (so-called "primary RR")							
	✗	✗	✗	✗	✗	✗	Zero	Very low
5	<i>Level 5 description:</i> ALL of the data or evidence that will be used to answer the research question already exist but are currently inaccessible to the authors and thus unobservable prior to IPA (e.g. held by gatekeeper)							
	✓	✗	✗	✗	✗	✗	Very low	Very low
4	<i>Level 4 description:</i> At least some of the data/evidence that will be used to answer the research question already exists AND is accessible in principle to the authors (e.g. residing in a public database or with a colleague) BUT the authors certify that they have not yet accessed any part of that data/evidence							
	✓	✓	✗	✗	✗	✗	Low	Low
3	<i>Level 3 description:</i> At least some data/evidence that will be used to answer the research question has been previously accessed by the authors (e.g. downloaded or otherwise received), but the authors certify that they have not yet observed ANY part of the data/evidence							
	✓	✓	✓	✗	✗	✗	Moderate	Moderate
2	<i>Level 2 description:</i> At least some data/evidence that will be used to answer the research question has been accessed and partially observed by the authors, but the authors certify that they have not yet sufficiently observed the key variables within the data to be able to answer the research question AND they have taken additional steps to maximise bias control and rigour (e.g. conservative statistical threshold; recruitment of a blinded analyst; robustness testing, multiverse/specification analysis, or other approach)							
	✓	✓	✓	✓	✗	✗	High – additional steps required to control bias	High
1	<i>Level 1 description:</i> At least some of the data/evidence that will be used to answer the research question has been accessed and the authors HAVE sufficiently observed the key variables to be able to answer the research question, but the authors certify that they have not yet performed ANY of their preregistered analyses, and, in addition, they have taken stringent steps to reduce risk of bias. Such measures will be similar to the countermeasures required for Level 2 but even more intensive, including an extremely conservative statistical threshold, recruitment of a blinded analyst, comprehensive robustness testing, the use of a broad multiverse/specification analysis, or other approaches for controlling risk of bias.							
	✓	✓	✓	✓	✓	✗	Very high – stringent steps required to control bias	Very high

Level 6: Data do not yet exist. Maximum bias control

Greater bias control

Levels 5 to 1:
Data already exist

Greater multi-disciplinary inclusivity

