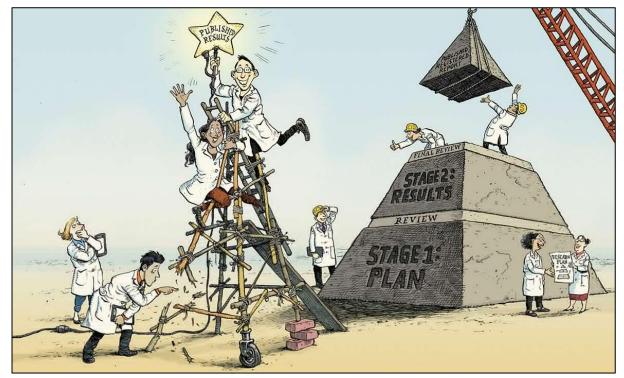






Registered Reports 2.0

Introducing the Peer Community in Registered Reports



Chris Chambers

School of Psychology, Cardiff University

Email: chambersc1@cardiff.ac.uk

Twitter/Mastodon: @chrisdc77

These slides: https://osf.io/wurhs

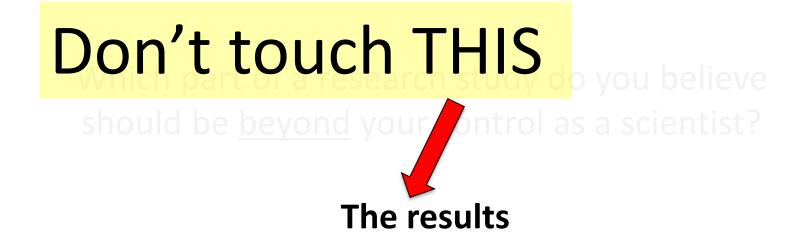
A paradox

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

The results

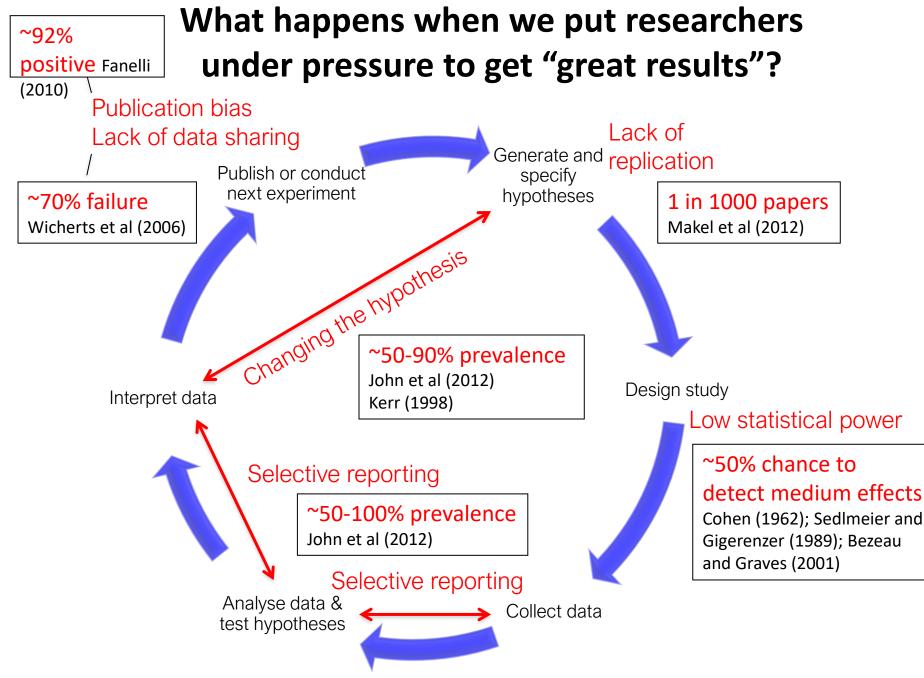
Which part of a research study do you believe is <u>most</u> <u>important</u> for advancing your career?

The results



But make sure THIS is amazing

The 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?

We 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

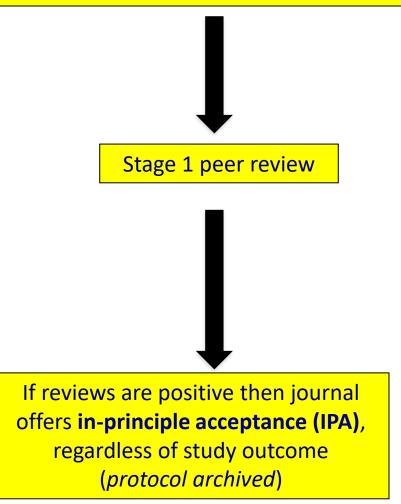
Cardiff University Brain Research Imaging Centre (CUBRIC), School of Psychology, Cardiff University, United Kingdom

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

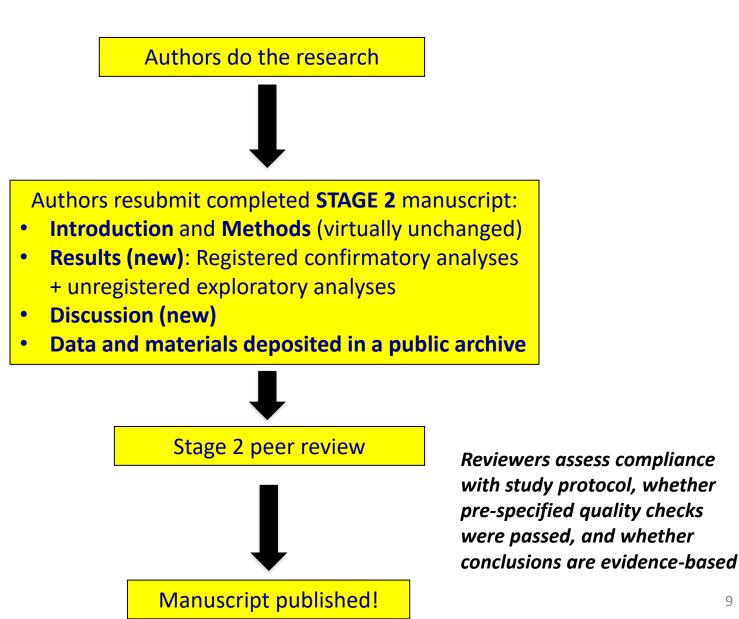
How it works

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



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

How it works



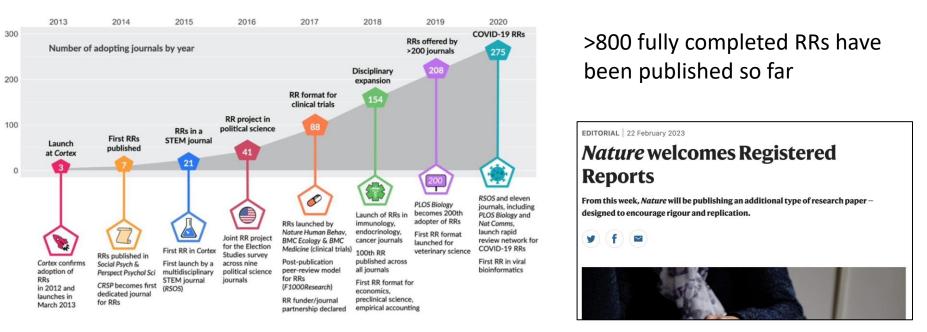
None of these things matter



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



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

Are Registered Reports working as intended?

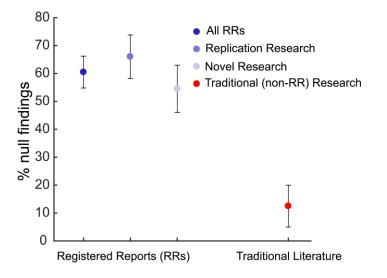
NEWS · 24 OCTOBER 2018

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 Warrer

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. <u>https://doi.org/10.1371/journal.pbio.3000246</u>

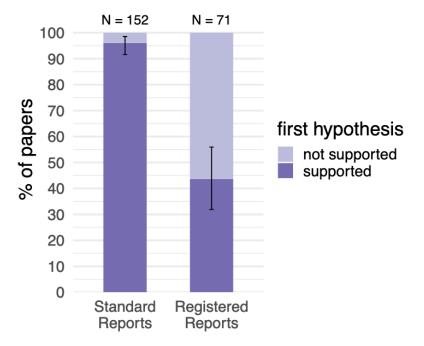


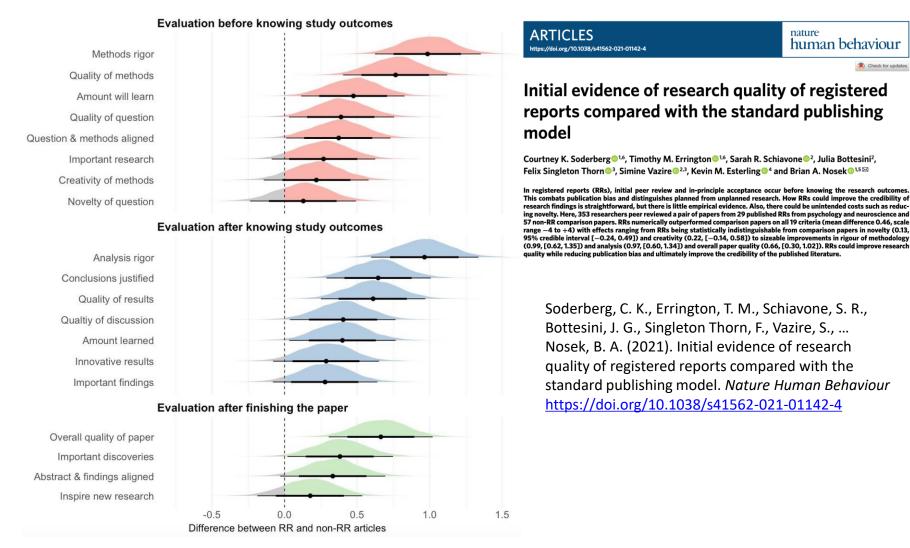
Figure 2. Positive result rates for standard reports and Registered Reports. Error bars indicate 95% confidence intervals around the observed positive result rate.

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?

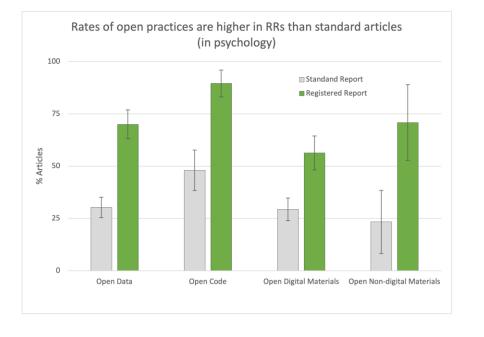
Check for updates



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?



(S)SAGE

iournals

(c) (i)

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 3, Issue 2, June 2020, Pages 229-237 © The Author(s) 2020, Article Reuse Guidelines https://doi.org/10.1177/2515245920918872

General Article

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

Pepijn Obels¹, Daniël Lakens (¹)¹, Nicholas A. Coles (¹)², 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!

But they aren't perfect. 9 known limitations include:

- 1. Stage 1 review time
- 2. Needing to commit to a journal before results are known
- 3. Not well suited to programmatic research where one Stage 1 protocol could lead to multiple Stage 2 outputs (current model is one S1 \rightarrow one S2)
- 4. Inconsistent editorial standards and levels of training/experience
- 5. Inconsistent transparency of accepted Stage 1 protocols (Hardwicke et al. 2018)
- 6. Inconsistent policies on open peer review
- 7. Inconsistent policies on open access and availability of Stage 2 articles
- 8. Unclear policies on applicability of RRs for analysis of existing data
- 9. Power resides with journals and (largely corporate) publishers to decide which RRs enter the peer-reviewed scientific record, 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

Peer Community In Registered Reports

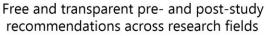
Discipline *non-specific* Registered Reports only

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 only



Reports





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

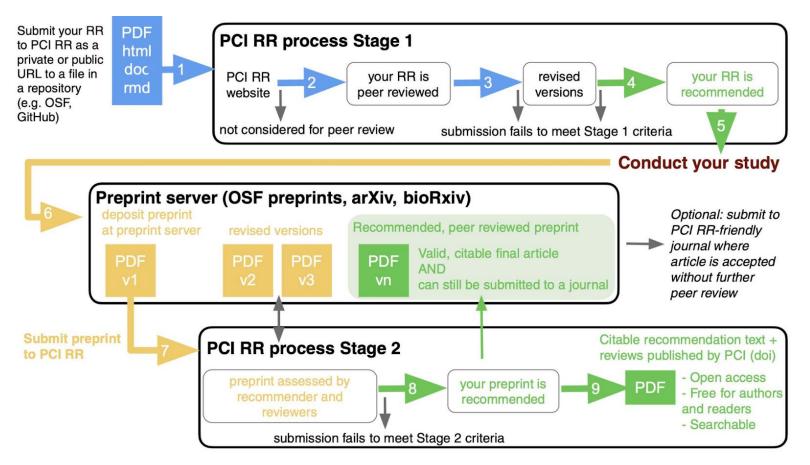
Web: <u>https://rr.peercommunityin.org/</u> Twitter: <u>@PCI_RegReports</u> Email: <u>contact@rr.peercommunityin.org</u>

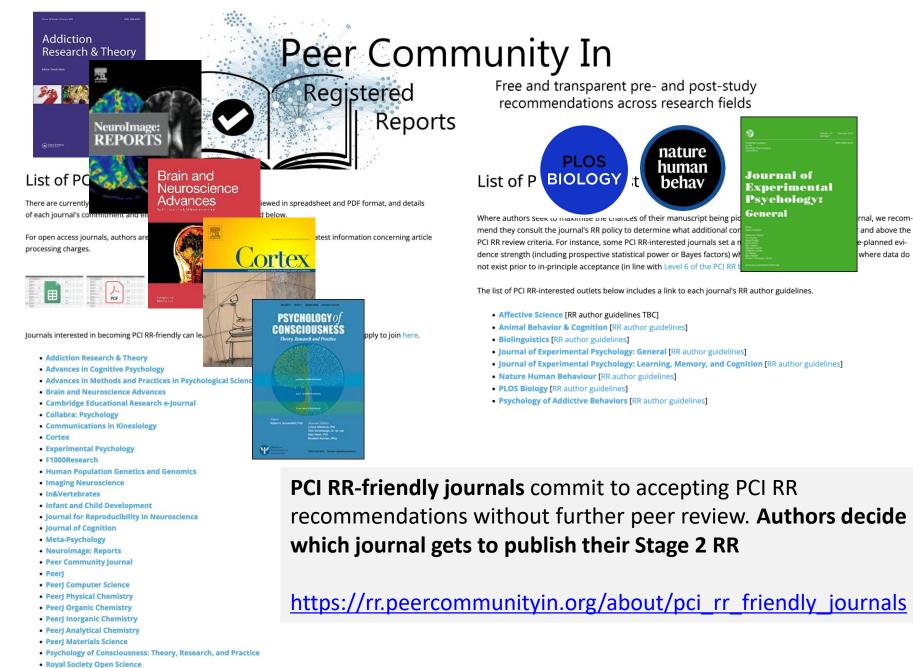
- Peer Community in Registered Reports (PCI RR) is a free, non-commercial platform dedicated to reviewing and recommending Registered Reports preprints across STEM, medicine, the social sciences and humanities
- Once a submission is recommended by PCI RR following peer review, the revised manuscript 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 a traditional journal, including a growing list of <u>PCI RR-friendly journals</u> that have committed to accepting PCI RR recommendations without further peer review



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

How it works





- Royal Society Open Scie
- Swiss Psychology Open
- WiderScreen



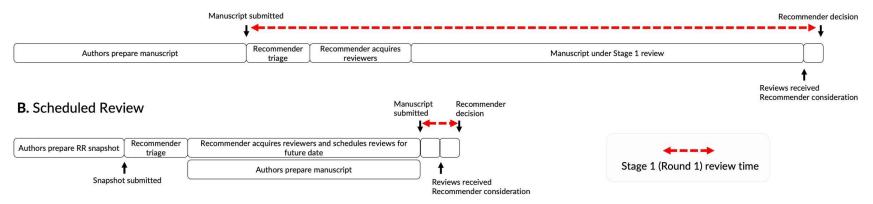
Other unique features

Programmatic RRs: One Stage 1 manuscript leading to multiple Stage 2 outputs See: <u>https://rr.peercommunityin.org/help/guide_for_authors#h_52492857233251613309610581</u>

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



Peer Community In

Reports

Registered

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

Peer Community in Registered Reports: Stage 1 Snapshot

Briefly summarise the study protocol using this template (1 page max, A4). Please use Arial font size 10, singlespaced, with a 0.5 inch (1.27cm) margin. All italicised text should be deleted from the submitted template. All bold text, including the header above, must be included.

- 1. Provisional title. Choose a title for the submission. If a full Stage 1 submission is invited, this can be updated.
- 2. Authors and affiliations. List all submitting authors and affiliations. If a full Stage 1 submission is invited, this can be changed. For submissions involving a large group of authors, and where listing them all would use too much of the space allocation, it is acceptable to list only the corresponding author and their affiliation, and link to a google doc or other accessible file containing the full list of contributors.
- 3. Field and keywords. State the general field of research and any specific keywords that identify the sub-field and the research topic.
- 4. Research question(s) and/or theory. Briefly summarise the research question(s) that will be addressed, and where relevant, the theoretical basis of the proposal. For a Programmatic RR, anticipate which questions will produce which Stage 2 outputs.
- 5. Hypotheses (where applicable). Where relevant, state any predictions of the study. These can be stated in less precise terms than is required for a full Stage 1 submission, for instance, by referring to specific concepts rather than variables or measurements. If a full Stage 1 submission is invited, this will be updated and refined.
- Study design and methods. Summarise in broad terms the study design, including (as applicable), key conditions and controls, data acquisition procedures, and variables.
- 7. Key analyses that will test the hypotheses and/or answer the research question(s). Summarise in broad terms how the data will be analysed. A detailed analysis plan is not required, but the clearer the link between the research question, hypotheses (as applicable), and analysis plans, the more likely the submission is to pass triage.
- 8. Conclusions that will be drawn given different results. Anticipate a range of possible/plausible results, what they would mean for theory or applications, and how they would answer the research question(s). For example, how would a particular hypothesis being supported vs. unsupported influence theory?
- 9. Key references. These must be numbered and include DOI URLS. To save space, the reference list can be presented succinctly in a single body of text using the following style: 1. Surname et al. (Year), https://doi.org/DOI. 2. Surname et al. (Year), https://doi.org/DOI. etc.

RR 'Snapshot' used in the Scheduled Review track

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	Level 6 description: 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	Level 5 description: 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)								
	1	×	×	×	×	×	Very low	Very low	
4	Level 4 description: 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								
	1	1	×	×	×	×	Low	Low	
3	Level 3 description: At least some data/evidence that will be used to the 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								
	1	1	~	×	×	×	Moderate	Moderate	
2	Level 2 description: 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)								
	1	1	1	1	×	×	High – additional steps required to control bias	High	
1	Level 1 description: At least some of the data/evidence that will be used to the 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.								
	1	1	1	1	1	×	Very high – stringent steps required to control bias	Very high	

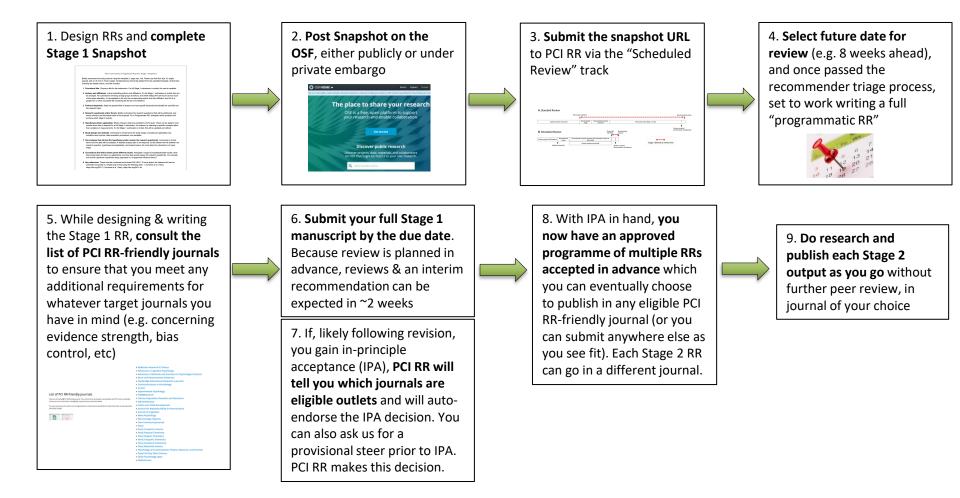
Level 6: Data do not yet exist. Maximum bias control

Greater bias control

Levels 5 to 1: Data already exist

Greater multi-disciplinary inclusivity

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



Recent example of a programmatic scheduled submission



Recommendation

📑 Share 🍏 Tweet

Printable page

Neurocognitive insights on instructed extinction in the context of pain

Chris Chambers based on reviews by Tom Beckers, Gaëtan Mertens and Karita Ojala

A recommendation of:



Modulatory effects of instructions on extinction efficacy in appetitive and aversive learning: A registered report Lea Busch, Kutja Wiech, Matthias Gamer, Balint Kincses, Tamas Spisak, Katharina Schmidt, Ulrike Bingel https://org/arc/759 version 3

Keywords

Submission: posted 15 October 2022 Recommendation: posted 13 July 2023, validated 13 July 2023

Recommendation

Rapid learning in response to pain is a crucial survival mechanism, relying on forming associations between cues in the environment and subsequent pain or injury. Existing evidence suggests that associations between conditioned stimuli (cues) and unconditioned aversive stimuli (such as pain) are learned faster than for appetitive stimuli that signal pain relief. In addition, when the link between a conditioned and unconditioned stimulus is broken (by unpairing them), the extinction of this learning effect is slower for aversive that appetitive stimuli. resulting in a flatter extinction slope. Understanding why extinction slopes are reduced for aversive stimuli is important for advancing theoretical models of learning, and for devising ways of increasing the slope (and thus facilitating extinction learning) could help develop more effective methods of pain relief, particularly in the treatment of chronic pain.

In the current programmatic submission, Busch et al. (2023) will undertake two Registered Reports to test whether a werbal instruction intervention that explicitly informs participants about contingency changes between conditioned and unconditioned Simuli facilitates extinction learning: especially for aversive (painful) stimuli, and how changes in extinction learning relate to neural biomarkers of functional connectivity. In the first Registered Report, they will initially seek to replicate previous findings including faster acquisition of aversive than appetitive conditioned stimuli as well as incomplete extinction of aversive conditioned stimuli without verbal instruction. They will then test how the instruction intervention alters extinction slopes and the completeness of extinction for appetitive and aversive stimuli, using a range of behavioral measures (expectancy and valence ratings) and physiological measures (pupliometry, skin conductance responses). To shed light on the neural correlates of these processes, in the second Registered Report the authors will use functional magnetic resonance imaging (fMR) to ask firstly how acquisition and extinction of aversive and appetitive conditioned responses are related to resting state brain connectivity within a network. Instruction neuring is associated with differences in resting state connectivity arcons this network.

The Stage 1 manuscript was evaluated over two rounds of in-depth review. Based on detailed responses to the reviewers' comments, the recommender judged that the manuscript met the Stage 1 criteria and therefore awarded inprinciple acceptance (IPA).

URL to the preregistered Stage 1 protocol: https://osf.io/cj75p (under temporary private embargo)

Level of bias control achieved: Level 6. 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.

List of eligible PCI RR-friendly journals

- Advances in Cognitive Psychology
- Brain and Neuroscience Advances (for RR #2 only)
- Cortex
- Experimental Psychology (for RR #1 only) *pending editorial consideration for disciplinary fit
 E1000Research
- FTOUDResearch
 Imaging Neuroscience (for RR #2 only)
- Imaging Neuroscie
 In&Vertebrates
- Insvertebrates
 Journal of Cognition (for RR #1 only)
- NeuroImage: Reports (for RR #2 only)
- Peer Community Journal
- Peerj
- Royal Society Open Science
 Swiss Psychology Open (for RR #1 only)

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

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

Peer Community In

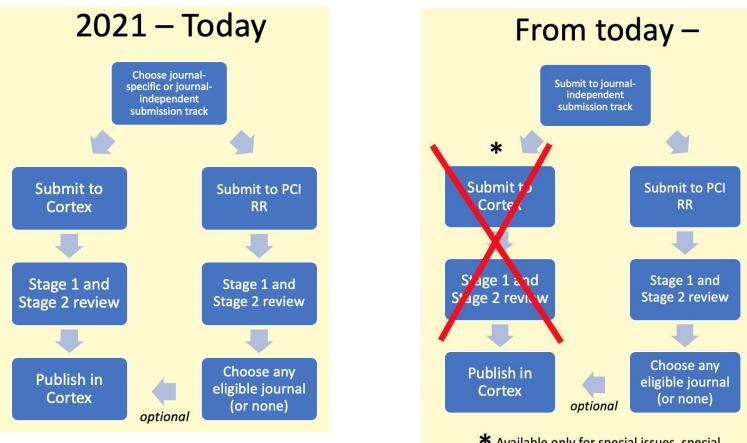


Free and transparent pre- and post-study recommendations across research fields

What are the benefits of PCI RR?	Regular non-RR article at a traditional journal	RR at a traditional journal	RR at PCI RR
Offers pre-study peer review	×	✓	✓
Offers in-principle acceptance before results are known	×	✓	✓
Offers programmatic RRs : one Stage 1 RR leading to multiple Stage 2 manuscripts	×	×	✓
Offers scheduled review to accelerate the Stage 1 review process	×	×	✓
Requires handling editor (or recommender) to have proven their knowledge of RRs by passing an entrance test, which serves as useful training of a rarely taught skill	×	×	✓
Peer review undertaken independently of any journal	×	×	✓
Author has the power to decide their destination journal (if any)	×	Very rare	✓
No need for author to decide on destination journal until after Stage 2 acceptance by PCI RR	×	Very rare	✓
Peer reviews for accepted manuscripts published online and free to read	×	Very rare	✓
Free for authors and readers	Depends on journal	Very rare	✓

Taking Registered Reports FAR BEYOND journals

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



Available only for special issues, special individual cases, or direct Stage 1 revisions that were already in progress

https://neurochambers.blogspot.com/2022/11/changing-culture-of-scientific.html

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/fag

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

~300 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

For more info, email contact@rr.peercommunityin.org or chambersc1@cardiff.ac.uk

Slides: <u>https://osf.io/wurhs</u>