

DRIVERS Journal Club Presentation:

ddle: a tool to combat publication bias by getting research out of the file drawer and into the scientific community

René Bernard, PhD

rene.bernard@charite.de

Twitter: @tombern

NeuroCure Excellence Cluster

QUEST Center of the BIH

**BIH QUEST**
Transforming Biomedical Research

 **NEUROCURE**
Cluster of Excellence

 **BIH** Berlin Institute
of Health
Charité & MDC

Aus Forschung wird Gesundheit

How would we classify this article type?

Not an IMRD paper.

Presentation of a (Community) Problem

Presentation of a Solution

Garnished with additional recommendations or conditions that need to be met

“Tracey Weissgerber style”: Question header – paragraph with direct answer

Research Waste

1. Research without a public record
2. Research that cannot be build on (no data availability)

Ressources for

- Application for funding
- Production of preliminary data
- Actual funding (taxpayer money)
- Study execution and evaluation
- life of animals sacrificed; health of patients affected
- Manuscript production (in some cases)

Estimated 85% of all the money invested in biomedical research is wasted

[https://doi.org/10.1016/S0140-6736\(13\)62329-6](https://doi.org/10.1016/S0140-6736(13)62329-6) (2014)



Publication as research with value

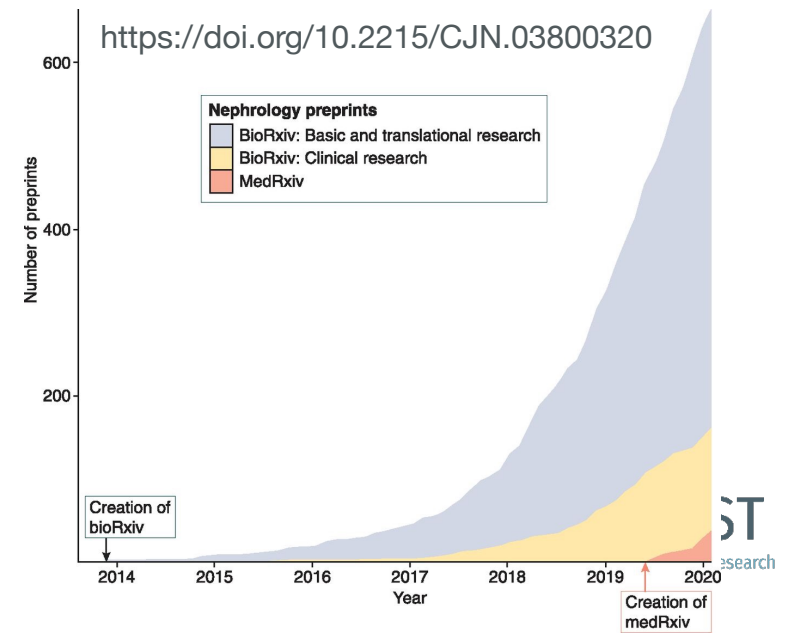
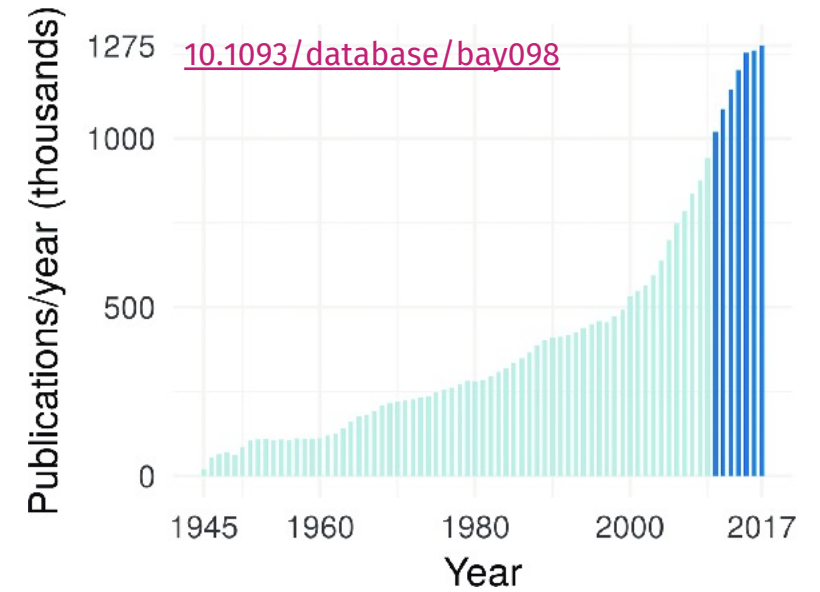
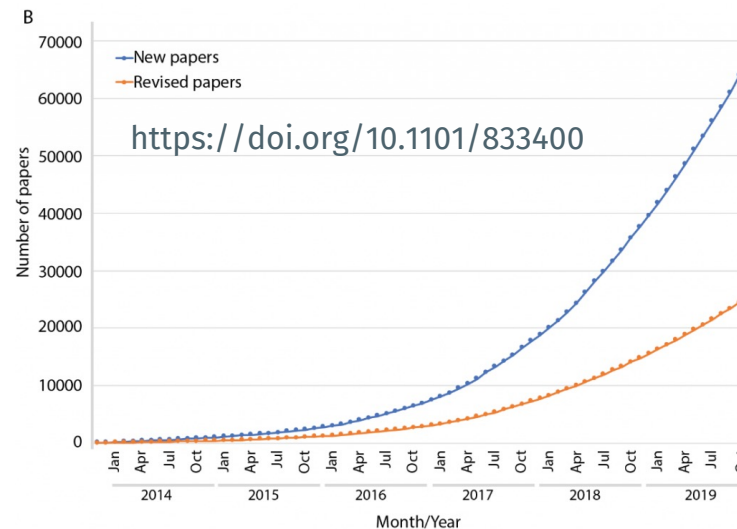
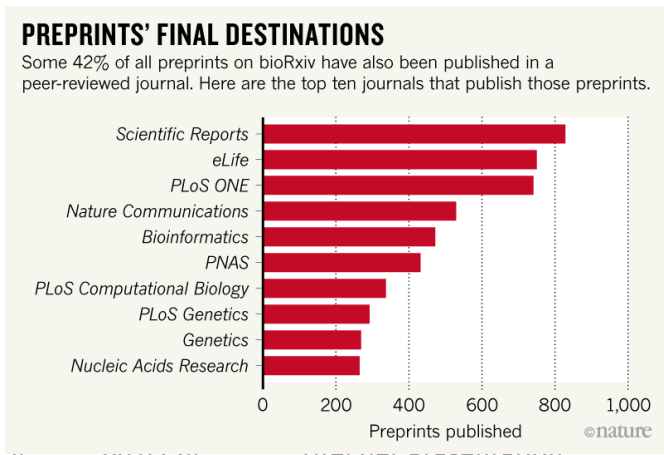
Rise in biomedical publications – do we really need more?

Isn't publishability a necessary factor to keep garbage out of the literature?

How many papers are never cited?

- The ten-year uncited rate across all disciplines, minus self-citation, is about 18% (accessability)

Is the rise in preprints a reaction to the failure of peer review



Contributors to publication bias

Publication bias occurs when study results influence decisions by authors, reviewers or editors about whether to publish a study, independent of the quality of the research.

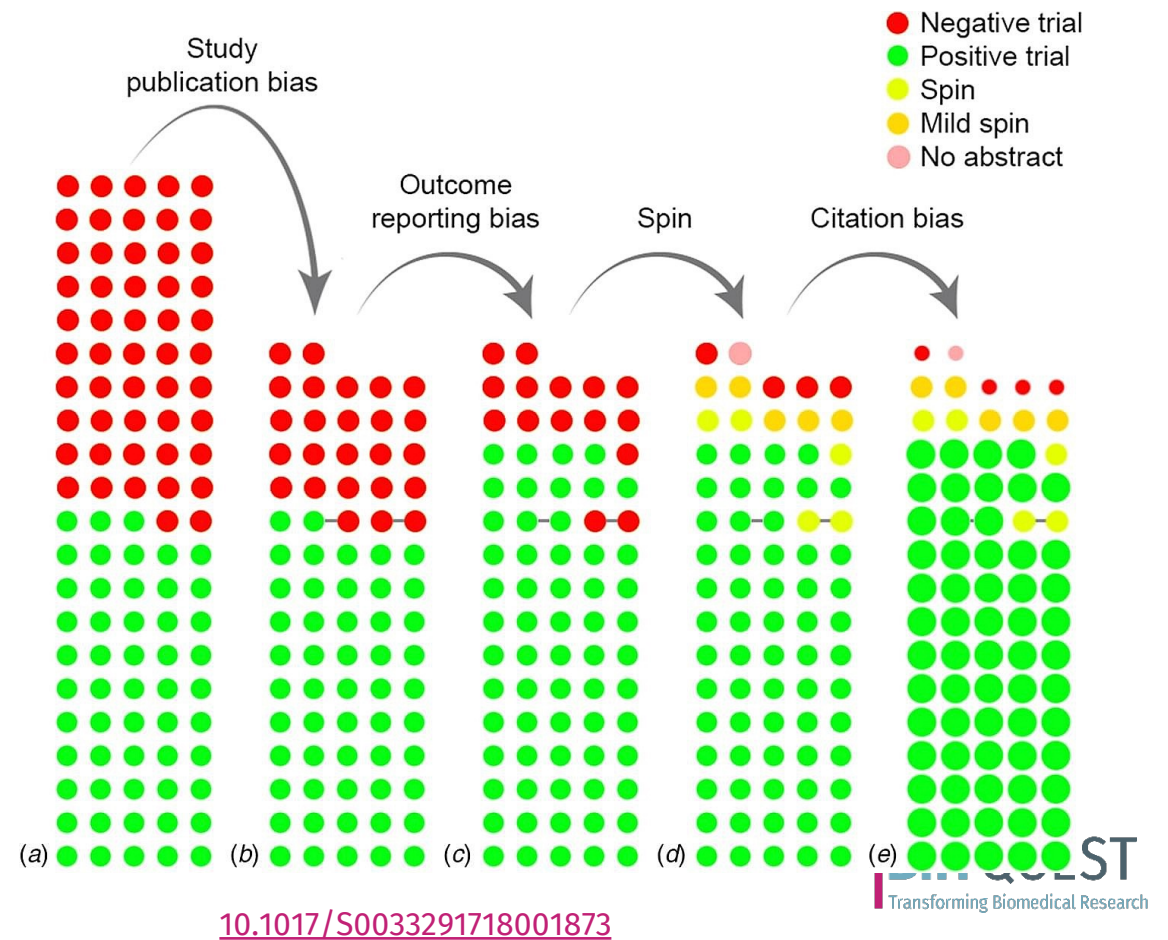
- **Prioritizing statistical significance:** statistically significant findings are important, relevant and therefore publishable
- **Prior publications:** a previously published effect is not found in the current study
- **Effect size:** A small effect size goes along with less confidence in the results and study design.
- **Statistical power:** small, underpowered studies vs. large, high-powered studies
- **Data distribution:** data with a certain degree of variance

We are conditioned to expect positive, stat. sign. results in publications that agree with prior findings. Data display little variance and have a reasonable effect. → **Finding**

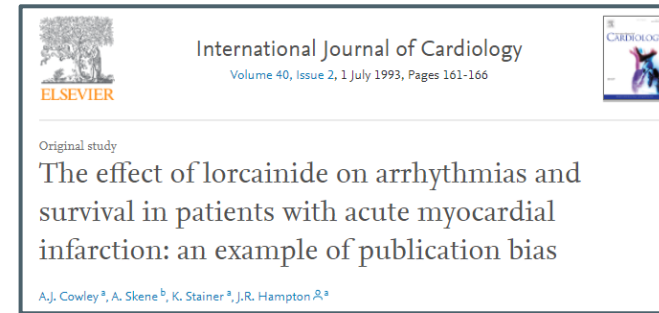
Null results – have a value but are absent from the literature

- **Null results**
 - Inconclusive results are hard to communicate
 - Preclinic: often viewed as „bad study design“
 - Large effort to be published (many revisions and rejections, years)
 - Less cited → little value for publishers
 - Little value for grant support
- **Line of unethical publishing behaviors can have real consequences**

The cumulative effect of reporting and citation biases on the apparent efficacy of treatments: The case of depression



Over 100,000 deaths before the unpublished study was brought to light and the prescriptions stopped



- In 1993, Cowley and his colleagues reported a controlled trial of the anti-arrhythmic drug lorainide in heart attack (N=100; 50 placebo; 50 drug). Nine men allocated to the drug had died compared with only one man allocated placebo in a trial that had been completed in 1980.
- *“On completing our study we tried to publish our results. Full of enthusiasm we started with The Lancet and then tried two or three cardiology journals. The result was always the same – immediate rejection...At a coffee break in 1993, someone remembered our old lorainide study and we realised that it was a perfect example of many of the failings of clinical trials. I suppose we had always felt that we had a moral duty to publish it...so we tried again, [and] again, the high-impact factor journals were not interested. It was perhaps as a final throw of the dice that we added the words ‘publication bias’ to the title, and so finally found a home for the paper.”*

But there is addition edge/extension to the the paper's definition of publication bias

That's why the file drawer narrative....

The science career traveler – another contributor to publication bias

Master's study (2-3 years)

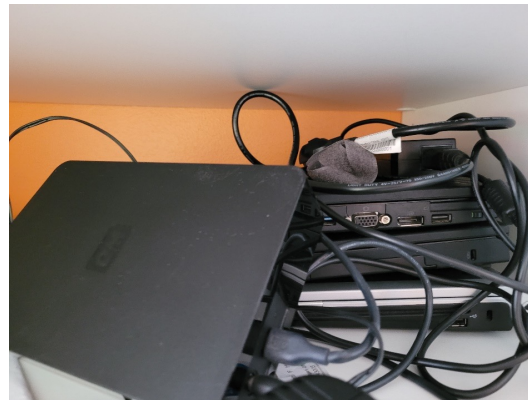
PhD study (4-5 years)

First postdoc (2-3 years)

Second postdoc (2-3 years)

Senior Scientist

- **At every station more data are produced and analyzed than published**
- **Data either remain at the institution or are carried on to the next with the promise to be published**
- **In reality, not everything gets published; it accumulates on electronic data carriers**



Confession time: My own publication bias story

Altered expression of glutamate signaling, growth factor, and glia genes in the locus coeruleus of patients with major depression

Bernard, R. ; Kerman, I. A. ; (...); Watson, S. J.

Published 2011 | [Molecular Psychiatry](#)

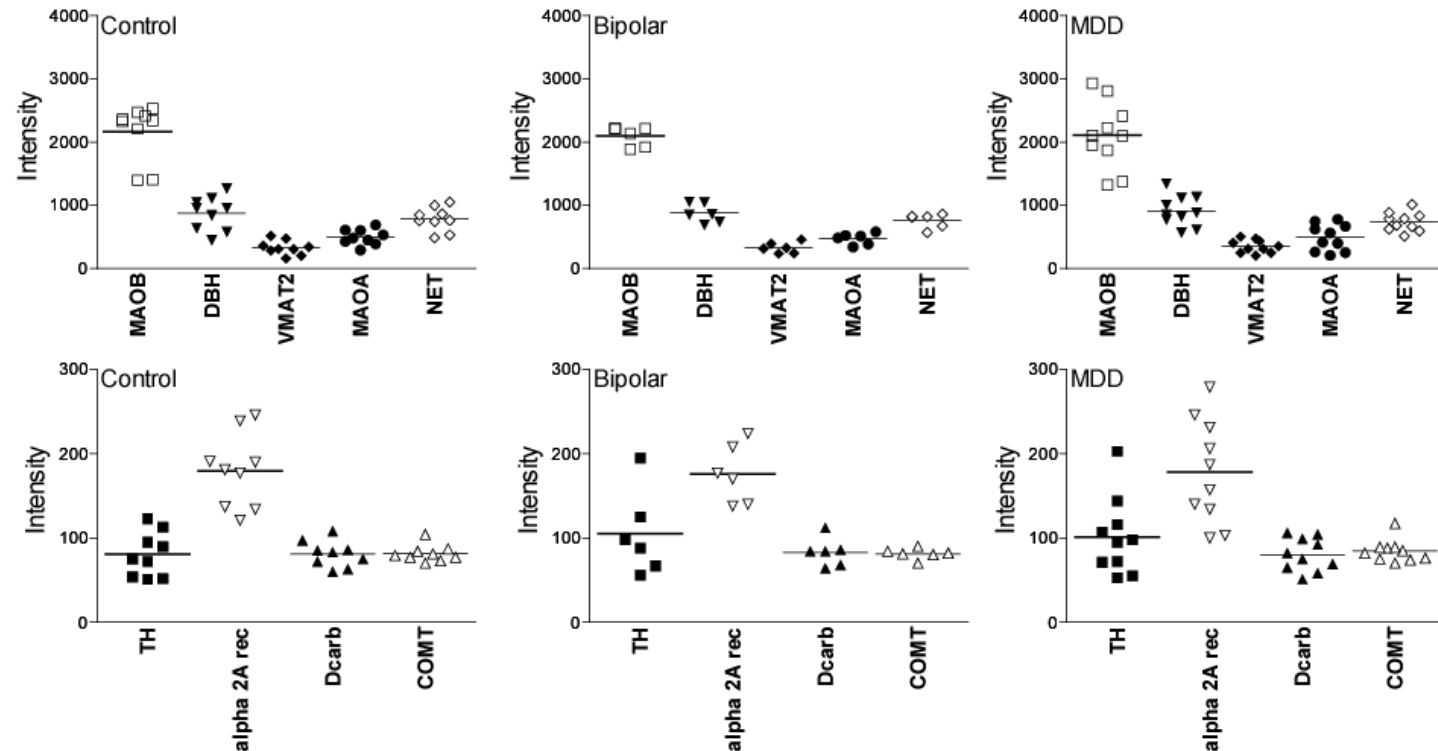
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Times
Cited

Null results and selective reporting:

- Senior authors
- Story telling focus
- Word limit
- Easier peer review

Signature transcript expression in the Locus Coeruleus



Alzheimer – fake data polute literature and don't get removed if there are no studies to counter them!



<https://www.science.org/content/article/potential-fabrication-research-images-threatens-key-theory-alzheimers-disease>

This kind of publishing of “negative results”—papers that don't give good news about a potentially promising idea—is not always encouraged, because **scientists have more reason to leave those results on the shelf** and spend time writing papers about things that do work.

But if no one knows that an effort to reproduce a scientific discovery has failed, then other scientists could spin their wheels driving down a blind alley.

„amyloid mafia“ bullied researchers that challenged the dogma—just doing their job: to be critical!

(Positive) Publication(s) as centerpiece of scientific career

[Published: 26 October 2016](#)

Fewer numbers, better science

[Rinze Benedictus](#), [Frank Miedema](#)  & [Mark W. J. Ferguson](#) 

Nature **538**, 453–455 (2016) | [Cite this article](#)

3461 Accesses | **67** Citations | **947** Altmetric | [Metrics](#)

Scientific quality is hard to define, and numbers are easy to look at. But bibliometrics are warping science – encouraging quantity over quality. Leaders at two research institutions describe how they do things differently.

Currently: Journal publication as practically the only measure of productivity and career promotion

The ideas behind fiddle

Not to leave researchers alone with their traditionally „unpublishable data“ in their file drawers

Show that other outlets exist but at the same time steer them towards a fitting solution:

- **Researchers should identify the situation that they are in (Why are these data not published?)**
- **Researchers should be able to select an scenario of properties they want for their data (If I publish these data they need to be...)**
- **Empower researchers! Get credit for scientific work! My work has merit!**
- **Catchy acronym: file drawer data liberation effort**

Possible Outlets for data

- **Datasets**
- **Micropublications**
- **Preprints**
- **Data journals**
- **Publishing Platforms**
- **Journals open to null results**

Criteria of importance

- **Publishable format of the data**
- **Publication funds?**
- **Outcome indexing?**
- **Peer review?**
- **Is time of the essence?**

Nine Scenarios – Why are data in the file drawer

- **I don't have enough time to prepare a publication**
- **My experiment or dataset is incomplete**
- **I have data that may be useful to others, but I am not able to analyze everything**
- **I have neutral or null results from a small, underpowered study or an explorative study**
- **I have neutral or null results from a larger, adequately powered study**
- **My study is completed but the findings are not novel or exciting**
- **I need the research to be published quickly**
- **I have no funding to pay for open access charges**
- **None of these describe my situation – show me the table of all options**

Outlet criteria for comparison

Description

Examples for providers

Effort

Publication Cost in \$/€

Time to publication

Recognition

**Publishing venue can have Impact
Factor**

Peer-Review

DOI

Versioning

Indexing:

Pubmed

PMC

Web of Science

Scopus

CrossRef

Google Scholar

Additional information

<https://s-quest.bihealth.org/fiddle/>

Quality of Reporting Data and Study Design

Garbage problem or what makes data “valuable“:

Research question: clearly stated

Participants, subjects, specimens or samples: who, how obtained, approval, consent

Study design: exploratory or confirmatory; assess and report risk of bias, sample size justification, inclusion & exclusion criteria, flow chart

Data: enriched with metadata, FAIR data principles, use of repositories

Results: what was measured, sample size for each group and/or analyses

Analysis: transparent, include code, description detailed enough for reproduction

Limitations: especially when study is small and maybe underpowered

Contact person: one, better two

Use reporting guidelines: <https://www.equator-network.org/>

Another use of fiddle – ERC projects

Research data generated during:

- **Lab rotations**
- **Internships**
- **Undergraduate biomedical research classes**

Journal publication is just one measure of productivity

Teaches the important of data ownership and what is needed to turn data into publication

Fair to both data producer and the principle investigator

Thank you very much!

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René Bernard   ; Tracey L. Weissgerber  ; Evgeny Bobrov  ; Stacey J. Winham  ; Ulrich Dirnagl  ; Nico Riedel 



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<https://s-quest.bihealth.org/fiddle/>