Open Citations as Academic & Cultural Capital

Reducing inequality in the communication & evaluation of science

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Bologna Sept 2018

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Hindawi

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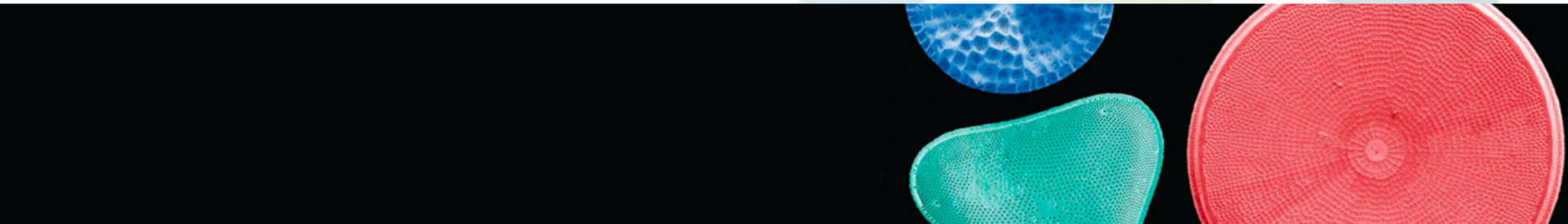

Transitioning Subscription Journals: The Hindawi–Wiley OA Partnership Pilot

Richard Bennett November 17th, 2016

The scholarly journals market has undergone huge transformations in recent years; print subscriptions gave way to electronic distribution, the big deal (for better or worse) came to be the dominant business model used to purchase journals, and open access moved from a small radical movement to become a core part of a scholarly publishers journal strategy.

November 2016

Hindawi signs publishing partnership agreement with AAAS

Richard Bennett September 11th, 2017

September 2017

Hindawi today announced the signing of a publishing partnership agreement with the American Association for the Advancement of Science (AAAS). Hindawi will support AAAS by providing post-acceptance publishing services for AAAS's new *Science* Partner Journal publishing program. AAAS anticipates its first partner journal will launch in early 2018.

Welcome to *Research*

The open access journal *Research*, the official journal of CAST, publishes innovative, wide-ranging research in life sciences, physical sciences, engineering and applied science. More

About *Research*

The journal *Research*, launching in 2018 as the first journal in the **Science Partner Journal (SPJ) program**, is the official journal of the **China Association for Science and Technology (CAST)**. *Research* is distributed by the American Association for the Advancement of Science (AAAS) in association with Science and Technology Review Publishing House, the official publishing house of CAST.

Submit Manuscript

MORE FROM *RESEARCH*

Health Warning

ABC news: http://www.abc.net.au/news/2018-04-13/cultural-capital/9613460 (not sure about copyright)

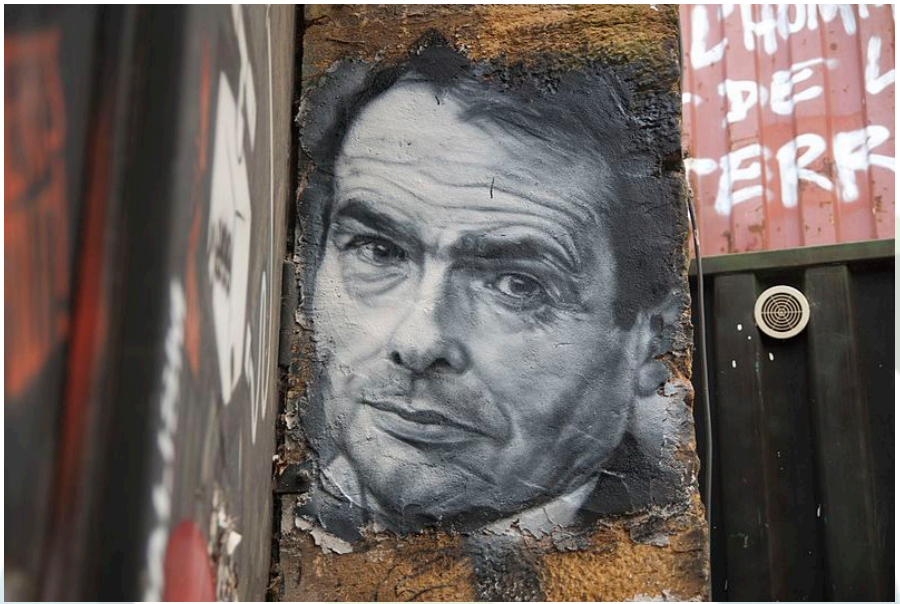

Photo of Pierre Bourdieu painting by Thierry Ehrmann (CC BY): https://commons.wikimedia.org/wiki/File:Pierre_Bourdieu,_painted_portrait_DDC_8931.jpg

Academic capital is the potential of an individual's education and other academic experience to be used to gain a place in society. … academic capital … is made up of many different factors, including the individual's academic transmission from his/her family, status of the academic institutions attended, and publications produced by the individual.

Academic qualifications
Institutional rank & publications

https://en.wikipedia.org/wiki/Academic_capital

Cultural capital refers to assets, e.g., competencies, skills, qualifications, which enable holders to mobilise cultural authority and can also be a source of misrecognition and symbolic violence. … A key part of this process is the transformation of people's symbolic or economic inheritance (e.g., accent or property) into cultural capital (e.g., university qualifications).

Academic Status
Prestige & Reputation
cultural assets that promote academic mobility

https://en.wikipedia.org/wiki/Cultural_capital

Cultural Capital

The objective mechanisms which enable the ruling class to keep the monopoly of the most prestigious educational establishments, while continually appearing at least to put the chance of possessing that monopoly into the hands of every generation, are concealed beneath the cloak of a perfectly democratic method of selection which takes into account only merit and talent, and these the members of the dominated classes whom they eliminate in the same way as they convert those whom they elect, and which ensures that those who are 'miraculously elected' may experience as miraculous an exceptional destiny which is the best testimony of academic democracy.

The current evaluation system prides itself on a system based on meritocracy when it is not based on real merit at all

Bourdieu, P. (1973). Cultural Reproduction and Social Reproduction. In R. Brown (Ed.), Knowledge, Education, and Cultural Change (pp. 71-112). London: Tavistock Publications Limited.

Open citations is about increasing equality of opportunity

ISSI Dec 2017

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Open citations: A letter from the scientometric community to scholarly publishers

December 5th, 2017

Openness is central to the research endeavor. It is essential to promote reproducibility and appraisal of research, reduce misconduct, and ensure equitable access to and participation in science. Yet, calls for increased openness in science are often met with initial resistance. The introduction of pre-print servers, open access repositories, and open data sets were, for example, initially resisted, but eventually adopted without adverse effects to the scholarly ecosystem. The launch of the Initiative for Open Citations (I4OC) is facing similar obstacles. This initiative has campaigned for scholarly publishers to make openly available the references found in articles from their journals. Many publishers, including most of the large ones, support the initiative and have opened their references. However, the initiative still lacks support from a minority of the large publishers.

"References are a product of scholarly work and represent the backbone of science—demonstrating the origin and advancement of knowledge—and provide essential information for studying science and making decisions about the future of research. References are generated by the academic community and should be freely available to this community."

Why do we need open citations?

I4OC

The ability to undertake large-scale and generalizable bibliometric research … is limited to a few well-funded centers that can afford to pay for full access to the raw data of Web of Science or Scopus.

…scientometricians need a data source that is freely available and comprehensive. This is a matter of scientific integrity, scientific progress, and equity

Scientometrics is widely used to support science policy and research evaluation, with consequences for the entire scientific community. *There is a need for specialized organizations, both commercial and non-commercial, that offer scientometric services.*

...to guarantee full transparency and reproducibility of scientometric analyses, ***these analyses need to be based on open data sources.***

advocating for open references is critical to ensure replicable and equitable research practices.

We should use our relationships with journals—as authors, reviewers, and editorial board members—to advocate for openness and should expect scientometric journals to be leaders in this respect.

Open Science

"Open science is about the way researchers work, collaborate, interact, share resources and disseminate results.

….will bring huge benefits for science itself, as well as for its connection with society. "

Amsterdam Call For Action April 2016
https://english.eu2016.nl/latest/news/2016/04/05/eu-action-plan-for-open-science

Open Science?

Jeff Rouder

@JeffRouder

What is Open Science? It is endeavoring to preserve the rights of others to reach independent conclusions about your data and work.

8:47 PM - 5 Dec 2017

Why

Open Science = Open Outputs + Open Infrastructure X Culture (change)

OPEN ACCESS

(& Open Standards)

How

Access, reuse & discoverability

Evaluation & Researcher behaviour

Opportunities

- Technological: to create a truly open and reusable technical infrastructure for scholarly communication.
- Economic: to fundamentally shift the business relationships between scholarly publishers and the research community from a model based on ownership, control, and journal brands to one based on value-added services, collaborative partnerships, and community engagement.
- Cultural: to decouple the communication of scholarly work from its evaluation, in particular removing journal competition and evaluation as a proxy of the quality of individual outputs and researchers, which has been a key barrier to realising these technological and economic opportunities.

MacCallum, CJ (2018) An Open Science future – Europe leads the way, Hindawi Blog https://about.hindawi.com/blog/an-open-science-future-europe-leads-the-way/

The Oligopoly of Academic Publishers in the Digital Era

Disciplines	1973	Mid 1990s	2013	Relative Share 2013
Natural and Medical Sciences	20%	30%	53%	• 47% by Reed-Elsevier, Springer, Wiley-Blackwell • ~6% T&F and Am. Chem. Society
Social Sciences & Humanities	10%	15%	51%	• Elsevier 16.4% • T&F 12.4% • Wiley-Blackwell 12.1% • Springer 7.1% • Sage 6.4%

Larivière V, Haustein S, Mongeon P (2015) The Oligopoly of Academic Publishers in the Digital Era. PLOS ONE 10(6): e0127502. doi:10.1371/journal.pone.0127502
http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0127502

Open Access by publisher

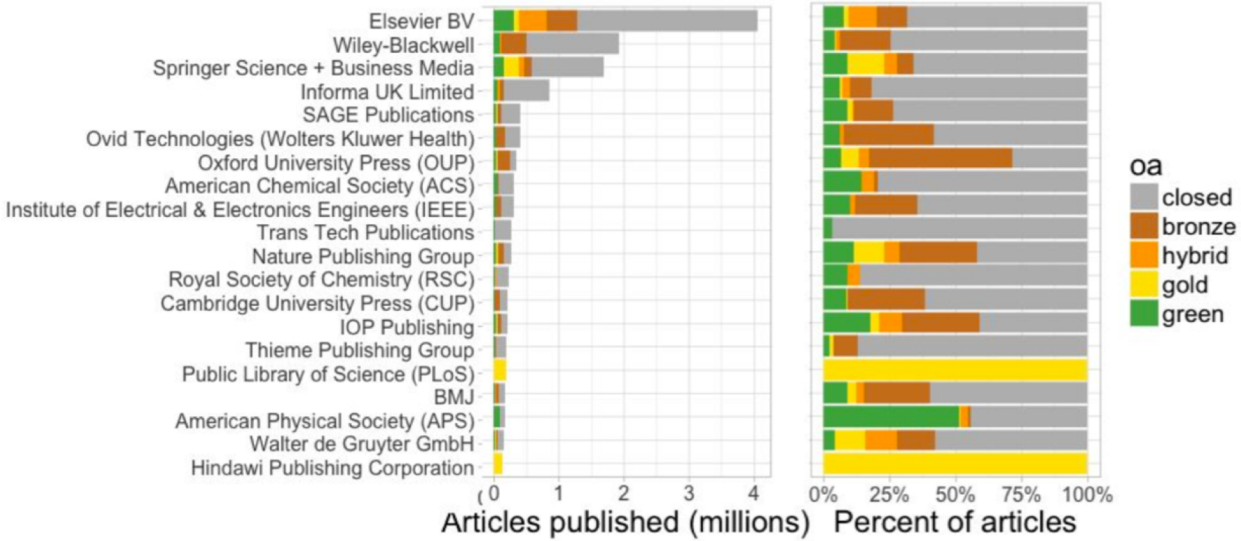
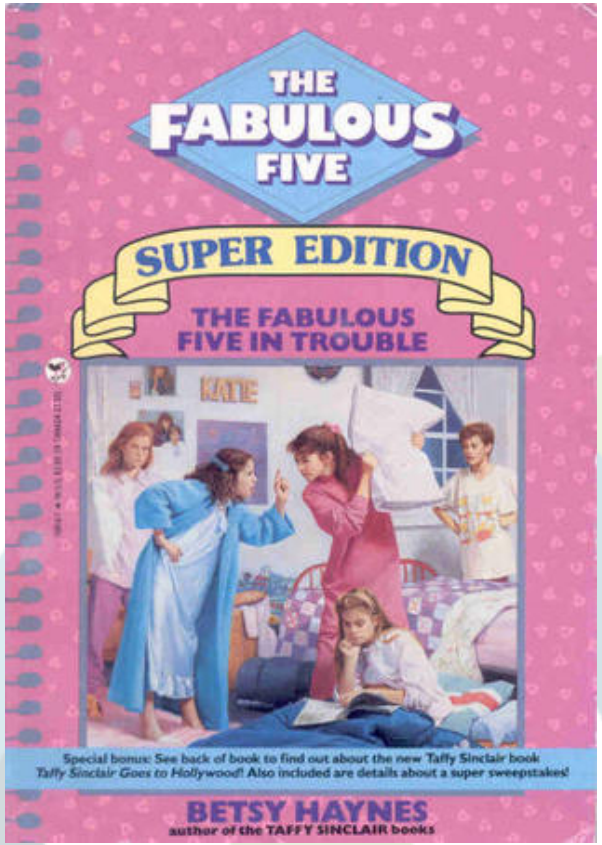


Figure 3: Number (left panel) and proportion (right panel) of articles with OA copies by publisher for the 20 most prolific publishers. Estimated based on a sample of 100,000 Crossref DOI-assigned articles.

Of the top-20 biggest publishers with citation data, all but five now make these data open via Crossref.

Three represent Scholarly Societies…



I4OC

Higher Education Network
Occam's corner

It's time for academics to take back control of research journals

The evolution into a highly-profitable industry was never planned. Academics must make the case for lower-cost journals

Academic publishing originated as a vehicle for communication for the gentlemen scholars. Photograph: David Levene for the Guardian

Stephen Curry
Professor of structural biology at Imperial College London
@Stephen_Curry

Thursday 25 May 2017 07.30 BST

"Publish or perish" has long been the mantra of academics seeking to make a success of their research career. Reputations are built on the ability to communicate something new to the world. Increasingly, however, they are determined by numbers, not by words, as universities are caught in a tangle of management targets composed of academic journal impact factors, university rankings and scores in the government's research excellence framework.

Untangling academic publishing: a history of the relationship between commercial interests, academic prestige and the circulation of research

Research output: Book/Report › Other report

Overview | Citation formats | Activities and awards | Funded projects

Standard

Untangling academic publishing : a history of the relationship between commercial interests, academic prestige and the circulation of research. / Fyfe, Aileen; Coate, Kelly; Curry, Stephen; Lawson, Stuart; Moxham, Noah; Rostvik, Camilla Mork.

St Andrews : University of St Andrews, 2017. 26 p.
Research output: Book/Report › Other report

Harvard

Fyfe, A, Coate, K, Curry, S, Lawson, S, Moxham, N & Rostvik, CM 2017, *Untangling academic publishing: a history of the relationship between commercial interests, academic prestige and the circulation of research.* University of St Andrews, St Andrews. DOI: 10.5281/zenodo.546100

APA

Fyfe, A., Coate, K., Curry, S., Lawson, S., Moxham, N., & Rostvik, C. M. (2017). *Untangling academic publishing: a history of the relationship between commercial interests, academic prestige and the circulation of research.* St Andrews: University of St Andrews. DOI: 10.5281/zenodo.546100

DOI

10.5281/zenodo.546100
Final published version

Open Access permissions

Open

Links

Open Access version in St Andrews Research Repository

394

Open Source

- prevents monopolistic control
- requires an active community of users and service providers to develop and maintain infrastructure

Open Data

- metadata about the research process itself, such as funding data, publication and citation data, and “altmetrics” data

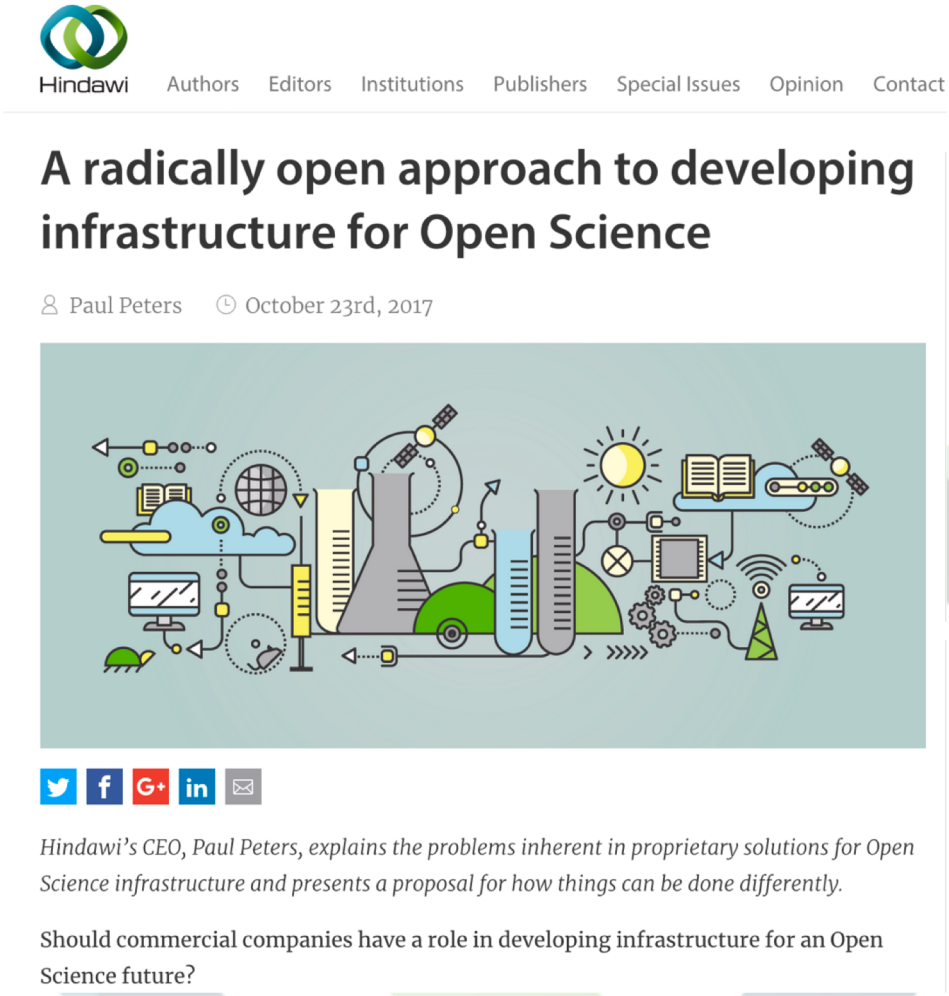
Open Integrations

- standard metadata formats and open APIs

Open Contracts

- completely open (public) and no lock-in (e.g. Non-Disclosure Agreements, multi-year contract terms, and privately negotiated prices)

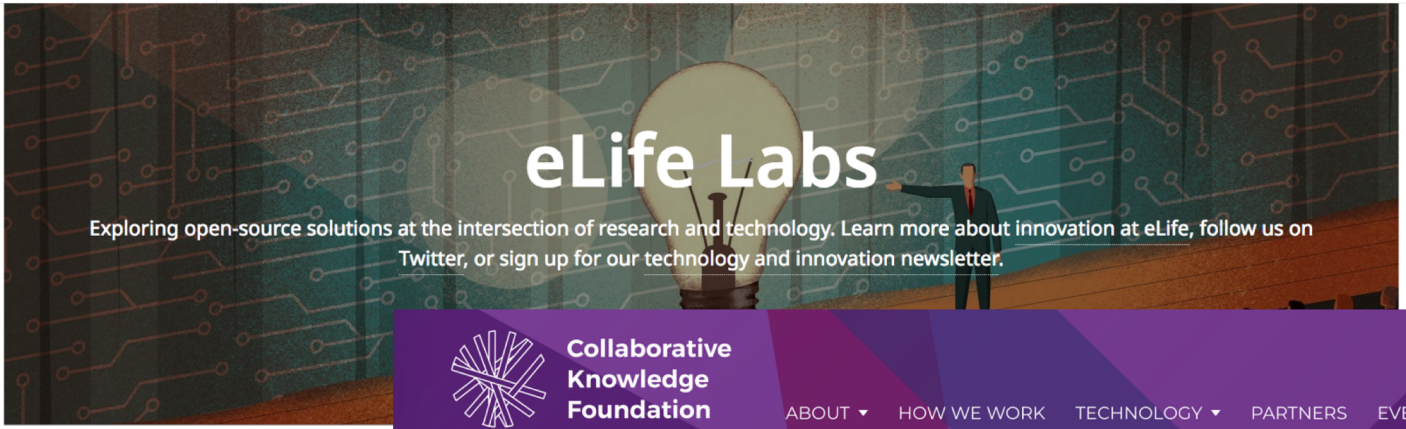
most of the data needed to support Open Science is controlled by commercial companies, both big and small. This growing reliance on a handful of companies to provide proprietary analytics and decision tools for research funders and universities poses serious risks for the future



eLIFE

ABOUT LABS COMMUNITY SUBMIT MY RESEARCH LOG IN/REGISTER

MENU HOME MAGAZINE



Collaborative Knowledge Foundation

ABOUT HOW WE WORK TECHNOLOGY PARTNERS EVENTS BLOG CONTACT

Open source publishing technology.

The Coko Foundation is a non-profit organization transforming how knowledge is created, improved, and shared. Our goal – to replace current scholarly communication technologies with open, shared infrastructure.

Publisher as service provider

- Open Access (CC BY)
- Encourage and facilitate better forms of credit
  - ORCID
  - CRediT taxonomy
  - Data /software citations
  - Protocols
- Preprints
- Encourage data / software / materials sharing
- Provide high quality metadata
- Open Citations
- Reduce friction
  - Enable connections and discovery
  - Adopt relevant persistent identifiers
  - Reduce the burden on researchers
  - Reduce the burden for funders and institutions
  - Enable a machine readable ecosystem
- An Open Infrastructure
- Charge for services not outputs

Project FREYA

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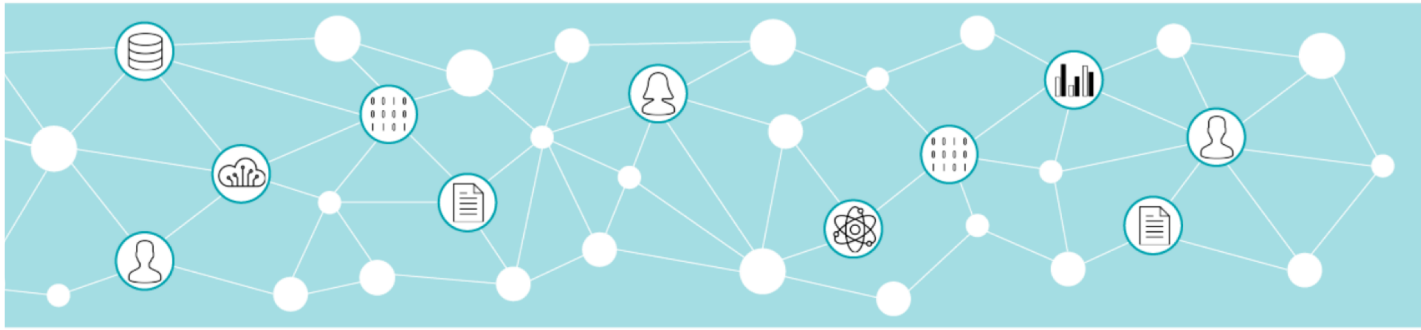


Welcome to FREYA

Connected Open Identifiers for Discovery, Access and Use of Research Resources

Read more about the project

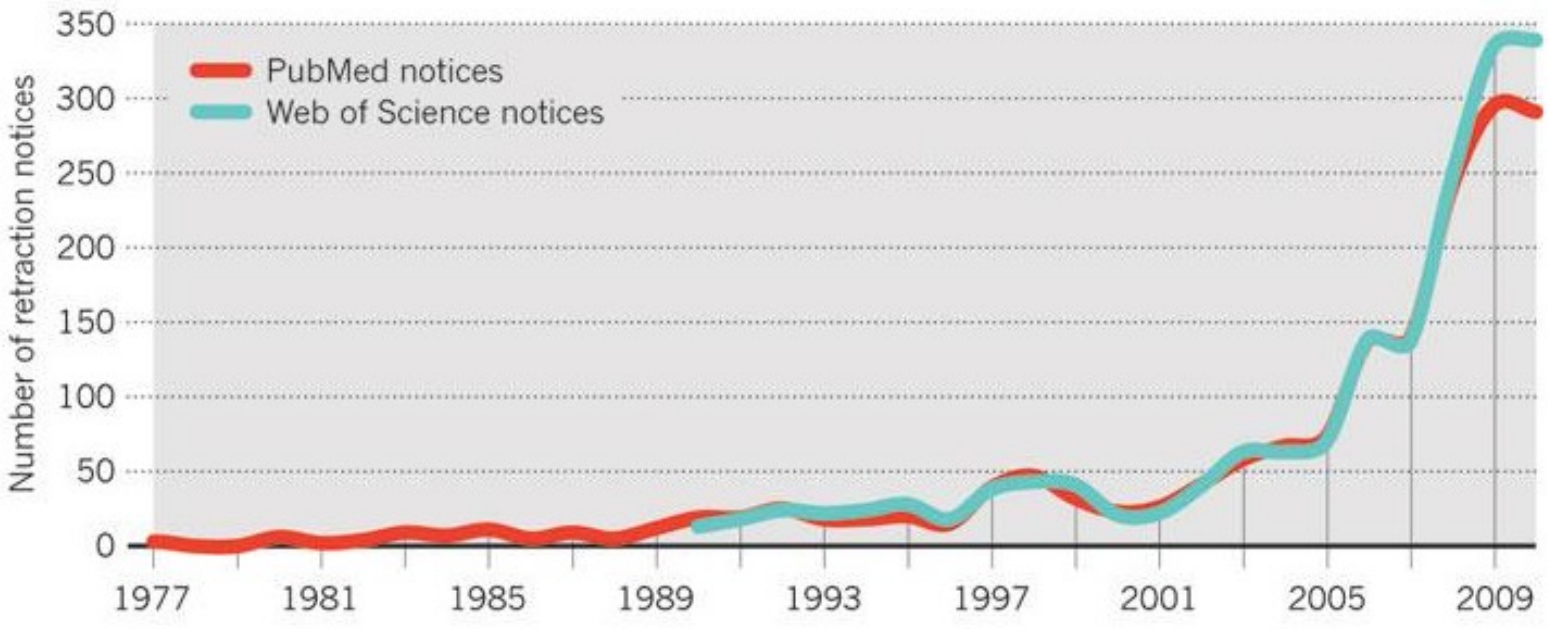
Join our Ambassador Programme

Follow FREYA's news & blog

“Current incentive structures in science, combined with existing conventions such as a significance level of 5%, encourage rational scientists to adopt a research strategy that is to the detriment of the advancement of scientific knowledge.“

Higginson AD, Munafò MR (2016) Current Incentives for Scientists Lead to Underpowered Studies with Erroneous Conclusions. PLoS Biol 14(11): e2000995. https://doi.org/10.1371/journal.pbio.2000995

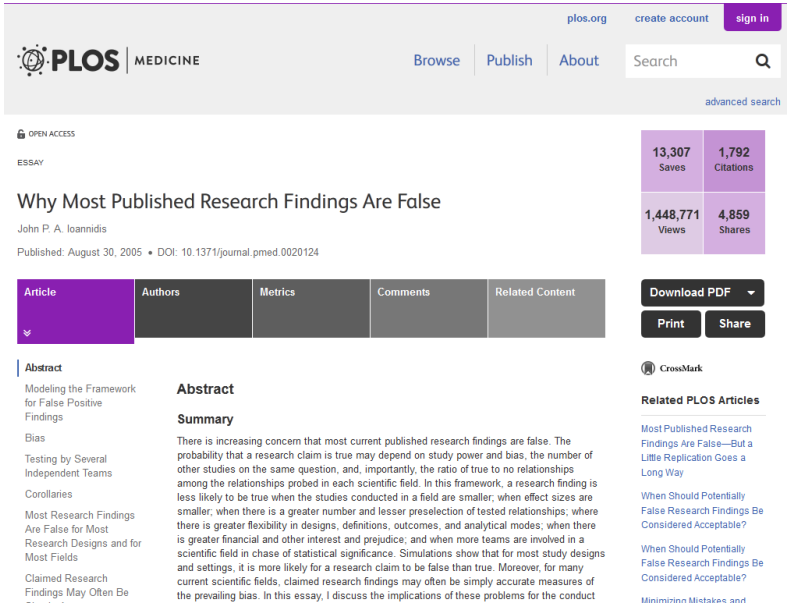
Retraction trends



In same period, volume of papers increased by 44%

Van Noorden, Nature 478, 26-28 (2011)

Is science (communication) trustworthy?



Science Communication

- Poorly Designed studies
  - small sample sizes, lack of randomisation, blinding and controls
- ‘p-hacking’ (selective analyses) widespread[1]
- Poorly reported methods & results[2]
- Negative/inconclusive results are not published
- **Data not available to scrutinise/replicate**

[1]Head ML, Holman L, Lanfear R, Kahn AT, Jennions MD (2015) The Extent and Consequences of P-Hacking in Science. PLoS Biol 13(3): e1002106. doi:10.1371/journal.pbio.1002106

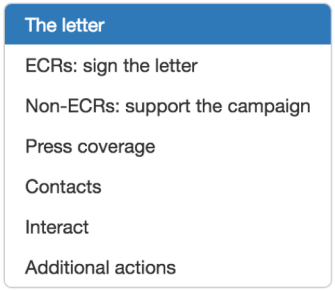
[2]Landis SC, et al. (2012) A call for transparent reporting to optimize the predictive value of preclinical research. Nature 490(7419): 187–191.

Does prestige ensure ‘quality’?

- Higher ranked journals have more papers retracted[1]
- Papers in higher ranked journals are more likely to report either no or inappropriate statistics[2,3]
- Papers from highly ranked institutions have poorer reporting standards[3]

[1]*Fang, Ferric C., and Arturo Casadevall. “Retracted Science and the Retraction Index.” Infection and Immunity 79, no. 10 (October 1, 2011): 3855–59. doi:10.1128/IAI.05661-11.*
[2]*Tressoldi PE, Giofre D, Sella F, Cumming G. High impact = high statistical standards? Not necessarily so. PLOS ONE 2013; 8(2):e56180. doi: 10.1371/journal.pone.0056180 PMID: 23418533*
[3] *Macleod MR, et al. (2015) Risk of Bias in Reports of In Vivo Research: A Focus for Improvement. PLOS Biol 13(10): e1002273. doi:10.1371/journal.pbio.1002273*

Bullied into bad science



The *Bullied Into Bad Science* campaign is an initiative by early career researchers (ECRs) for early career researchers who aim for a fairer, more open and ethical research and publication environment.

(University of Cambridge)

http://bulliedintobadscience.org/

We are postdocs and a reader in the humanities and sciences at the University of Cambridge. **We are concerned about the desperate need for publishing reform** to increase transparency, reproducibility, timeliness, and academic rigour of the production and dissemination of scholarly outputs (see Young et al. 2016, Smaldino & McElreath 2016).

We have identified actions that institutions and managers can take to better support ECRs (below). These actions are crucial for our success because we are eager to publish openly and at places that keep profits inside academia in accordance with many modern online publication venues (Logan 2017). However, **ECRs are often pressured into publishing against their ethics** through threats that we would not get a job/grant unless we publish in particular journals (Carter et al. 2014, Who is going to make change happen?, Kent 2016; usually these journals are older and more familiar, have a print version, a high impact factor, and are not 100% open access). These out of date practices and ideas hinder ECRs rather than help us: evidence shows that publishing open access results in increased citations, media attention, and job/funding opportunities (McKiernan et al. 2016). Open dissemination of all research outputs is also a fundamental principle on which ECRs rely to fight the ongoing reproducibility crisis in science and thus improve the quality of their research.

To support ECRs in this changing publishing landscape, we encourage funders, universities, departments, and politicians to

"As competition for jobs and promotions increases, the inflated value given to publishing in a small number of so-called "high impact" journals has put pressure on authors to rush into print, cut corners, exaggerate their findings, and overstate the significance of their work.

Such publication practices, abetted by the hypercompetitive grant system and job market, are changing the atmosphere in many laboratories in disturbing ways."

Rescuing US biomedical research from its systemic flaws
Bruce Alberts , Marc W. Kirschner , Shirley Tilghman, and Harold Varmus
PNAS | April 22, 2014 | vol. 111 | no. 16 | 5773–5777
doi: 10.1073/pnas.1404402111

Hypercompetition 1

- Selection for high output leads to poorer methods and increasingly high false discovery rates.
- Replication slows but does not stop methodological deterioration.
- Common methodologies can change over time not only because established researchers are strategically changing their methods, but also because certain researchers are more successful in transmitting their methods to younger generations.
- between 1974 and 2014, the frequency of the words ‘innovative’, ‘groundbreaking’ and ‘novel’ in PubMed abstracts increased by 2500% or more.

Smaldino, Paul E., and Richard McElreath. “The Natural Selection of Bad Science.” Royal Society Open Science 3, no. 9 (September 21, 2016). https://doi.org/10.1098/rsos.160384. and refs within

Hypercompetition 2

- volume alone is often perceived as a measure of researcher quality, particularly for early-career researchers (who don’t have citations).
- since the adoption of the h-index, researchers have been observed to artificially inflate their indices through self-citation.
- positive results in support of some novel hypothesis are more likely to be published than negative results, particularly in high-impact journals.
- researchers who can obtain more positive results—whatever their truth value—will have an advantage
- Researchers don't publish negative research
- even firmly discredited research is often cited by scholars unaware of the discreditation.

Smaldino, Paul E., and Richard McElreath. “The Natural Selection of Bad Science.” Royal Society Open Science 3, no. 9 (September 21, 2016). https://doi.org/10.1098/rsos.160384. and refs within

Perverse Incentives

The more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor.

Donald T. Campbell (1976, p. 49)

I've been on a number of search committees. I don't remember anybody looking at anybody's papers. Number and IF [impact factor] of pubs are what counts.

Terry McGlynn (realscientists) (21 October 2015, 4:12 p.m. Tweet.)

Quotes at start of Smaldino, Paul E., and Richard McElreath. "The Natural Selection of Bad Science." Royal Society Open Science 3, no. 9 (September 21, 2016). https://doi.org/10.1098/rsos.160384.

Incentives drive culture & create inequality

The biggest barriers to Open Science are the perverse incentives in the reward and evaluation systems that make authors and other stakeholders reluctant to share

- The primacy of publications and the journal as a proxy of quality with which to award grants and assign tenure (the impact factor…)
  - Financial bonuses
- Lack of reward for data and other outputs
  - Lack of transparency & poor reporting
  - Publication bias

Perverse Incentives…

TABLE 1. GROWING PERVERSE INCENTIVES IN ACADEMIA

Incentive	*Intended effect*	*Actual effect*
"Researchers rewarded for increased number of publications."	"Improve research productivity," provide a means of evaluating performance.	"Avalanche of" substandard, "incremental papers"; poor methods and increase in false discovery rates leading to a "natural selection of bad science" (Smaldino and Mcelreath, 2016); reduced quality of peer review
"Researchers rewarded for increased number of citations."	Reward quality work that influences others.	Extended reference lists to inflate citations; reviewers request citation of their work through peer review
"Researchers rewarded for increased grant funding."	"Ensure that research programs are funded, promote growth, generate overhead."	Increased time writing proposals and less time gathering and thinking about data. Overselling positive results and downplay of negative results.
Increase PhD student productivity	Higher school ranking and more prestige of program.	Lower standards and create oversupply of PhDs. Postdocs often required for entry-level academic positions, and PhDs hired for work MS students used to do.
Reduced teaching load for research-active faculty	Necessary to pursue additional competitive grants.	Increased demand for untenured, adjunct faculty to teach classes.
"Teachers rewarded for increased student evaluation scores."	"Improved accountability; ensure customer satisfaction."	Reduced course work, grade inflation.
"Teachers rewarded for increased student test scores."	"Improve teacher effectiveness."	"Teaching to the tests; emphasis on short-term learning."
"Departments rewarded for increasing U.S. News ranking."	"Stronger departments."	Extensive efforts to reverse engineer, game, and cheat rankings.
"Departments rewarded for increasing numbers of BS, MS, and PhD degrees granted."	"Promote efficiency; stop students from being trapped in degree programs; impress the state legislature."	"Class sizes increase; entrance requirements" decrease; reduce graduation requirements.
"Departments rewarded for increasing student credit/contact hours (SCH)."	"The university's teaching mission is fulfilled."	"SCH-maximization games are played": duplication of classes, competition for service courses.

Modified from Regehr (pers. comm., 2015) with permission.

Marc A. Edwards and Siddhartha Roy.Environmental Engineering Science.Jan 2017.ahead of print http://doi.org/10.1089/ees.2016.0223

Italian scientists increase self-citations in response to promotion policy

Study reveals how research evaluations can lead to self-serving behaviour.

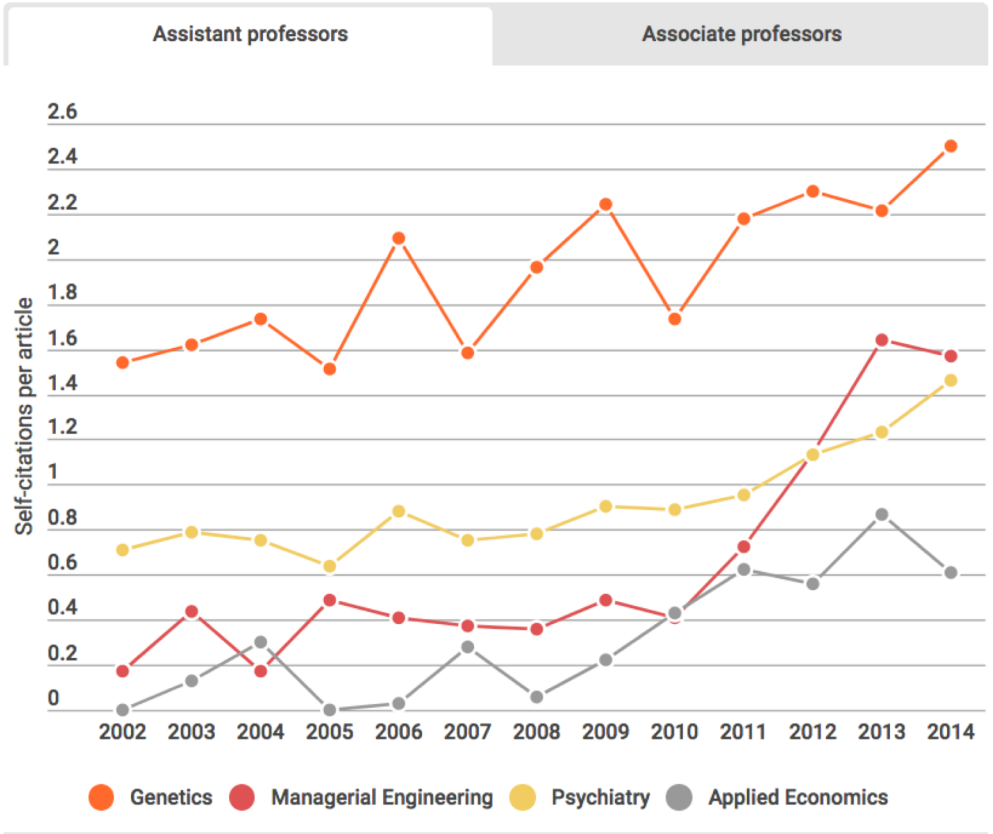
4 June 2018

Dalmeet Singh Chawla

Topp_Yimgrimm/iStock/Getty

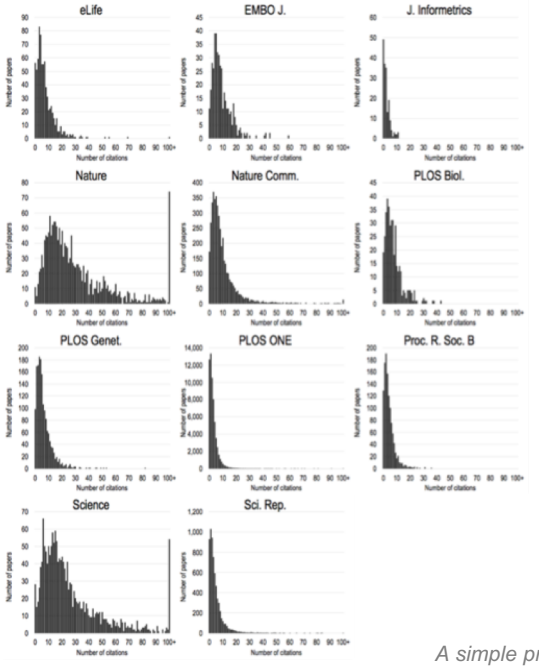
Citation selfies

Italian researchers cite more of their own work following a 2010 law that links promotions to citation metrics in certain fields in the natural and social sciences. Quantitative measures are used to assess researchers in genetics, psychiatry and managerial engineering, but not in applied economics.



Impact factors mask huge variation in citations - if you use it you are dishonest and statistically illiterate @Stephen_Curry #COASP

COASP7 'Research and researcher evaluation' (2015), Stephen Curry (Imperial College London) – available soon from OASPA website



Reciprocal Space

Home About Stephen

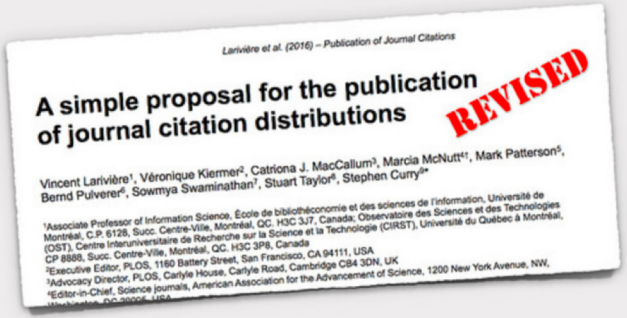
← ICYMI No.7: a day in the life of a naked scientist

Ways of Seeing →

Pride and Prejudice and journal citation distributions: final, peer reviewed version

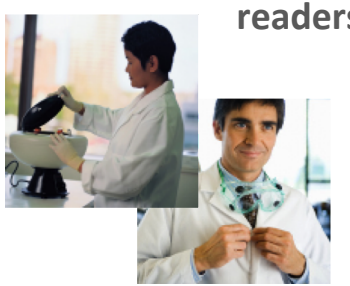
Posted on September 12, 2016 by Stephen

Today sees the publication on bioRxiv of a revised version of our preprint outlining "A simple proposal for the publication of journal citation distributions." Our proposal, explained in more detail in this earlier post, encourages publishers to mitigate the distorting effects on research assessment of journal impact factors (JIFs) by providing a simple method for publishing the citation distributions that are so incompletely characterized by the JIF.



A simple proposal for the publication of journal citation distributions, 2016 Vincent Lariviere et al bioRxiv 062109; doi: https://doi.org/10.1101/062109

Researchers
(authors and readers)



Policy Makers

Institutions

University of Glasgow

UNIVERSITY OF GOTHENBURG

UNIVERSITY of CALIFORNIA

Who cares about measuring research impact?

Publishers

PLoS BIOLOGY

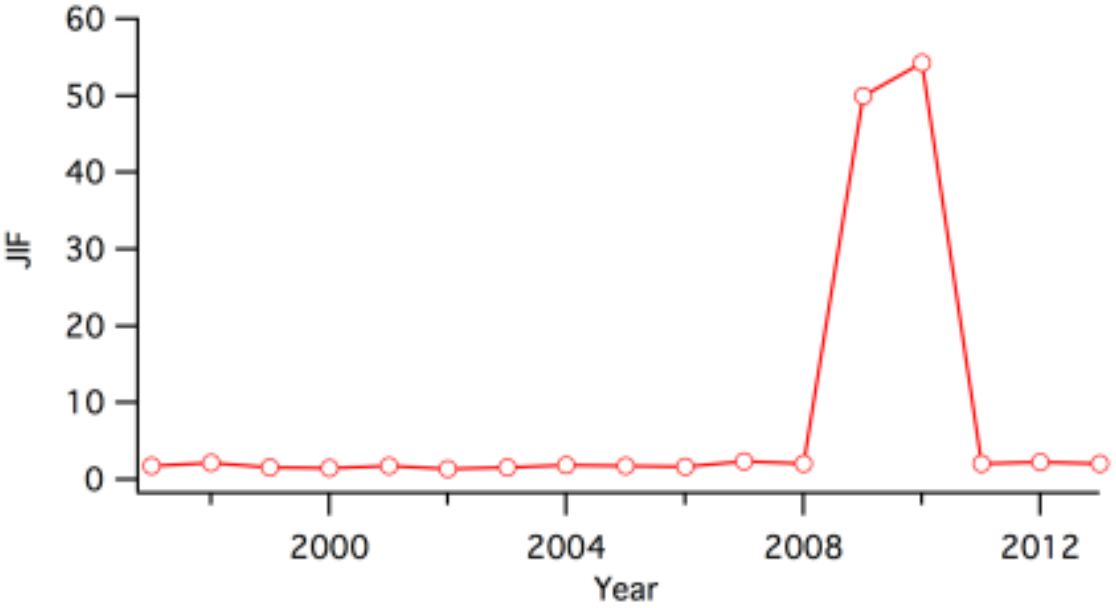
Science

Funders

wellcome trust

NATIONAL INSTITUTES OF HEALTH

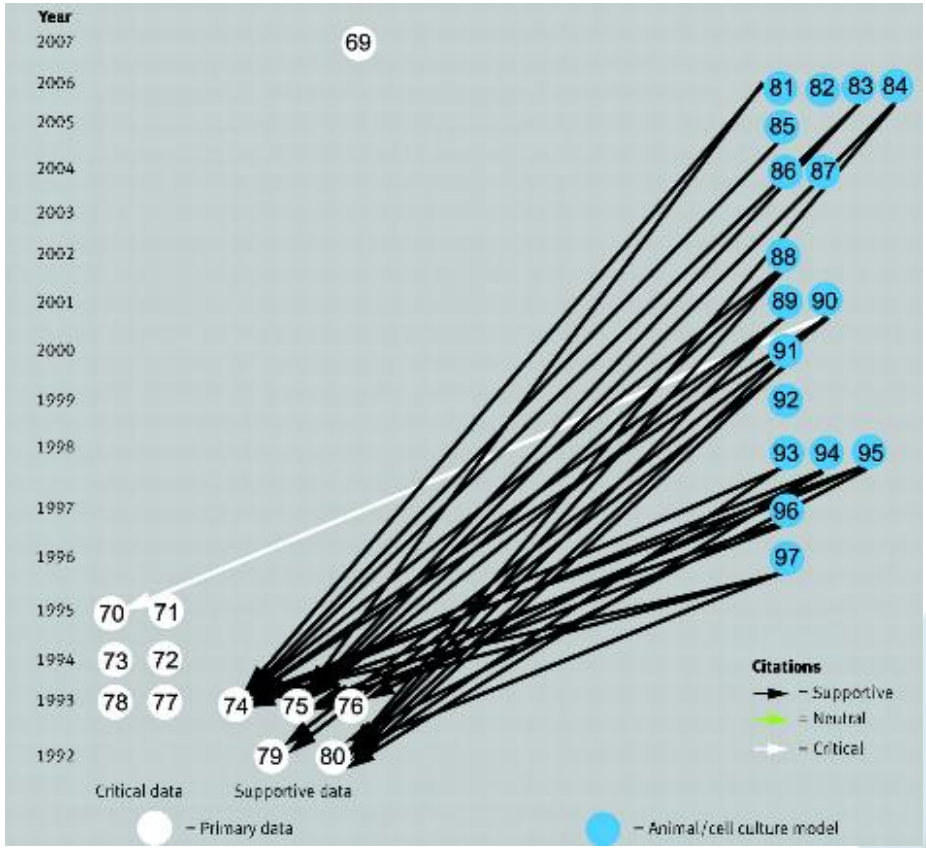
The public



The *Acta Crystallographica Section A* effect. The plot shows that **this journal had a JIF of 2.051 in 2008 which jumped to 49.926 in 2009 due to a single highly-cited paper.** Did every other paper in this journal suddenly get amazingly awesome and highly-cited for this period? Of course not.

Steve Royle. "Wrong Number: A Closer Look at Impact Factors." Quantixed, May 2015. https://quantixed.wordpress.com/2015/05/05/wrong-number-a-closer-look-at-impact-factors/

Citation Bias 1



- Citations to papers supporting rationale for overproduction of β amyloid precursor protein mRNA as a valid model of inclusion body myositis.

- **The supportive papers received 94% of the 214 citations to these primary data, whereas the six papers containing data that weakened or refuted the claim received only 6% of these citations**

Citation Bias 2

- Affiliation matters - both to get your paper published and in terms of the number of citations received
- As the number of countries represented in the author list increases, articles are more likely to be published in journals with higher impact factors and accrue more citations
  - In ecology - US and Chinese co-authors publish articles in higher-tier journals than do Chinese authors alone (US alone receive most).
  - Franco-American collaborations fare better than papers published by either country independently
- The publication and citation share of countries in the Global North are decreasing over time, while those of China, India and South Korea are increasing.

Smith MJ, Weinberger C, Bruna EM, Allesina S (2014) The Scientific Impact of Nations: Journal Placement and Citation Performance. PLoS ONE 9(10): e109195. doi:10.1371/journal.pone.0109195

Citation Bias 3

- existing multidisciplinary journals preferentially concentrate most-cited papers from scientific fields with high citation densities.
    - They have no or minimal share in the most influential scientific articles of 1/3 of fields examined (8 of the 21), including Mathematics [and...] other sciences with very strong mathematical methodology and rigorous theoretical and applied methods such as Computer Science, Engineering, Space Science, Agricultural Sciences and practically all social sciences (General, Psychiatry/Psychology, Economics)

- the journal is the most important factor for a paper to receive citations - even more important than newsworthiness and quality that are also important for predicting future citation impact [13].

Ioannidis, John P. A. "Concentration of the Most-Cited Papers in the Scientific Literature: Analysis of Journal Ecosystems." PLoS ONE 1, no. 1 (December 20, 2006). https://doi.org/10.1371/journal.pone.0000005.

Imperfect Impact

Clinical trial registration: Looking back and moving ahead

(Published mid 2007)

New Eng. J. Med. 45 (53.298)

Lancet 24 (38.278)

J. Am. Med. Assoc. 21 (30.026)

Annals Int. Med. 11 (16.733)

Brit. Med. J. 7 (14.093)

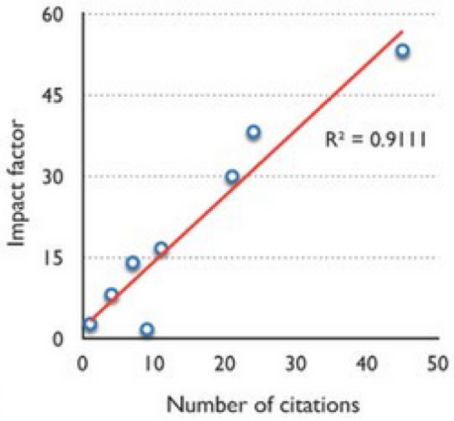
Can. Med. Assoc. J. 4 (8.217)

Med. J. Aust. 1 (2.813)

Croat. Med. J. 9 (1.796)

Total citations until the end of 2011

(2011 Impact Factor)



Stuart Cantrill January 23, 2016 **Imperfect impact** Chemical connections

https://stuartcantrill.com/2016/01/23/imperfect-impact/

Citation Bias 4

- The motives for citing a paper are domain-specific. Affected by
  - geographic location of authors and citers
  - number of authors
  - direction of results
  - the length of a paper and potentially other factors as well [14], [15]
  - they are almost chaotic to investigate in detail [16]–[18].
- there is no guarantee that the most-cited papers would even be “correct” or truly the “best” ones in the field. Controversy and refutation may also sometimes attract debate and citations [22].
- In science, most-cited papers may be large tents where hundreds and thousands of scientists are flocking to.

Ioannidis, John P. A. “Concentration of the Most-Cited Papers in the Scientific Literature: Analysis of Journal Ecosystems.” PLoS ONE 1, no. 1 (December 20, 2006). https://doi.org/10.1371/journal.pone.0000005. and refs within

Can Scientists Assess Merit or Predict Impact?

Analysed subjective rankings of papers from two different data sets over five years

- Faculty of 1000
- Welcome Trust (data from Allen et al. of 2 assessor rankings within 6 months of publication)
- In relation to citations and impact factor

Eyre-Walker A, Stoletzki N (2013) The Assessment of Science: The Relative Merits of Post-Publication Review, the Impact Factor, and the Number of Citations. PLoS Biol 11(10): e1001675. doi:10.1371/journal.pbio.1001675

http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.1001675

Subjective assessments of science are poor:

Very weak correlation between assessors

Strongly biased by the journal in which the paper was published

Number of citations or the impact factor exaggerates differences between papers

Scientists are also poor at predicting the future impact:

Because they are not good at assessing merit

Similar articles accumulate citations essentially by chance.

"What this paper shows is that whatever merit might be, scientists can't be doing a good job of evaluating it when they rank the importance or quality of papers. From the (lack of) correlation among assessor scores, most of the variation in ranking has to be due to 'error' rather than actual quality differences."

Carl Bergstrom , 2013

Eisen JA, MacCallum CJ, Neylon C (2013) Expert Failure: Re-evaluating Research Assessment. PLoS Biol 11(10): e1001677. doi:10.1371/journal.pbio.1001677

What is Quality?

- Context dependent
  - Discipline
  - Stage of your career
  - Different levels
    - Individual
    - Project
    - Institutional (rankings…)
    - National and International
- Cannot be distilled into a single number or proxy
  - Multi-variate
- Metrics need to be qualitative as well as quantitative


‘qualities…’
Nicolas Raymond https://www.flickr.com/photos/82955120@N05/8691488200/in/photostream/ CC BY


not ‘quality’

We need to apply the scientific method to the process of scholarly communication itself

bioRxiv preprint first posted online Jul. 5, 2016; doi: http://dx.doi.org/10.1101/062109. The copyright holder for this preprint (which was not peer-reviewed) is the author/funder. It is made available under a CC-BY 4.0 International license.

Larivière et al. (2016) – Publication of Journal Citation Distributions

A simple proposal for the publication of journal citation distributions

Vincent Larivière[1], Véronique Kiermer[2], Catriona J. MacCallum[3], Marcia McNutt[4†], Mark Patterson[5], Bernd Pulverer[6], Sowmya Swaminathan[7], Stuart Taylor[8], Stephen Curry[9*]

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[5]Executive Director, eLife, 24 Hills Road, Cambridge CB2 1JP, UK
[6]Chief Editor, The EMBO Journal, Meyerhofstrasse 1,69117 Heidelberg, Germany
[7]Head of Editorial Policy, Nature Research, Springer Nature, 225 Bush Street, Suite 1850, San Francisco 94104, USA
[8]Publishing Director, The Royal Society, 6-9 Carlton House Terrace, London SW1Y 5AG, UK
[9]Professor of Structural Biology, Department of Life Sciences, Imperial College, Exhibition Road, London, SW7 2AZ, UK

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This is a revised version of the preprint that was first published on bioRxiv 06 Jul 2016 (doi: 10.1101/062109). We have made additions to address many comments received on the original version. These changes are summarized along with our replies to Comments document (Supplemental File 4).

Abstract

Although the Journal Impact Factor (JIF) is widely acknowledged to be a poor indicator of the quality of individual papers, it is used routinely to evaluate research and researchers. Here, we present a simple method for generating the citation distributions that underlie JIFs. Application of this straightforward protocol reveals the full extent of the skew of these distributions and the variation in citations received by published papers that is characteristic of all scientific journals. Although there are differences among journals across the spectrum of JIFs, the citation distributions overlap extensively, demonstrating that the citation performance of individual papers cannot be inferred from the JIF. We propose that this methodology be adopted by all journals as a move to greater transparency, one that should help to refocus attention on individual pieces of work and counter the inappropriate usage of JIFs during the process of research assessment.

Introduction

The problem of over-reliance on the Journal Impact Factor (JIF)[1] for research and researcher assessment has grown markedly in the 40 years since its original conception in 1972 as a tool for librarians in making decisions on the purchase of journal subscriptions (1). Many stakeholders in academia and academic publishing have recognized that JIFs exert an undue influence in judgements made about individual researchers and individual research papers (2-5).

The main deficiencies of the JIF have been discussed in detail elsewhere (2, 3, 6, 7) but may be summarized as f calculated inappropriately as the arithmetic mean distribution of citations[2]; it contains no measure o distribution; it obscures the high degree of overlap citation distributions of most journals; it is not rep data that support it are not publicly available (8, 9 higher level of precision (three decimal places) th the underlying data; it is based on a narrow two-y that is inappropriate for many disciplines and take large variation in citation levels across disciplines citations to 'non-citable' items, and citations to pr papers are conflated with citations to reviews – m to gaming and subject to negotiation with Thomso 12); its relationship with citations received by ind questionable and weakening (13).

We welcome the efforts of others to highlight the of JIFs on research assessment (notably, the San F Declaration on Research Assessment (DORA) (14 Manifesto (15), and the Metric Tide report (16)) – concrete steps to mitigate their influence. We also statements by funders around the world (*e.g.* Rese (17), the Wellcome Trust (18), the European Mole Organisation (EMBO) (19), the Australian Resear and the Canadian Institutes of Health Research (2 should be taken of JIFs in assessing grant applicat encouraged by those journals that have cautioned misappropriation of JIFs in researcher assessment.

[1] *The JIF is formally defined as the mean number of citations received in a given year by papers published in a journal over the two previous ye*

[2] *Although the JIF is presented as an arithmetic mean, the numerator is the total number of citations received by all documents published in the denominator is the subset of documents that Thomson Reuters classifies as 'citable' (i.e. 'Articles' and 'Reviews').*

recommendations:

- *We encourage journal editors and publishers that advertise or display JIFs to publish their own distributions using the above method, ideally alongside statements of support for the view that JIFs have little value in the assessment of individuals or individual pieces of work (see this example at the Royal Society). Large publishers should be able to do this through subscriptions to Web of Science™ or Scopus™; smaller publishers may be able to ask their academic editors to generate the distributions for their journals.*
- *We encourage publishers to make their citation lists open via Crossref, so that citation data can be scrutinized and analyzed openly.*
- *We encourage all researchers to get an ORCID iD, a digital identifier that provides unambiguous links to published papers and facilitates the consideration of a broader range of outputs in research assessment.*

These recommendations represent small but feasible steps that should improve research assessment. This in turn should enhance the confidence of researchers in judgements made about them and, possibly, the confidence of the public in the judgements of

Sowmya Swaminathan: writing – review and editing
Stuart Taylor: methodology, formal analysis, investigation, writing – original draft preparation, visualization
Stephen Curry: conceptualization, investigation, writing – original draft preparation, review and editing

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Larivière et al. (2016) – Publication of Journal Citation Distributions

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References are Data

- Between scholars, fields and science & society
- A source with which to validate a scholarly work
- One of the most expertly curated sources of scholarly recommendations…

Current culture embeds status quo

- Researchers gain from publishing in ‘designer’ journals
  - Citation bias (conscious & sub-conscious)
  - Evaluation bias
- Journals gain financially from their brand/ Journal Impact factor
- Institutions gain financially by hiring and firing based on where researchers publish, not on what they publish (or the mission of the University)
- Research assessment by funders often based on very few publications and brand/impact factor (some are changing)

Cultural Capital

In short, an institution officially entrusted with the transmission of the instruments of appropriations of the dominant culture which neglects methodically to transmit the instruments indispensable to the success of its undertaking is bound to become the monopoly of those social classes capable of transmitting by their own means, that is to say by that diffuse and implicit continuous educational action which operates within cultured families (often unknown to those responsible for it and to those who are subjected to it), the instruments necessary for the reception of its message, and thereby to confirm their monopoly of the instruments of appropriation of the dominant culture and thus their monopoly of that culture ….

Lack of transparency about evaluation and what constitutes merit maintains the power imbalance and inequity of opportunity in academia
'the rich get richer'

Bourdieu, P. (1973). Cultural Reproduction and Social Reproduction. In R. Brown (Ed.), Knowledge, Education, and Cultural Change (pp. 71-112). London: Tavistock Publications Limited.
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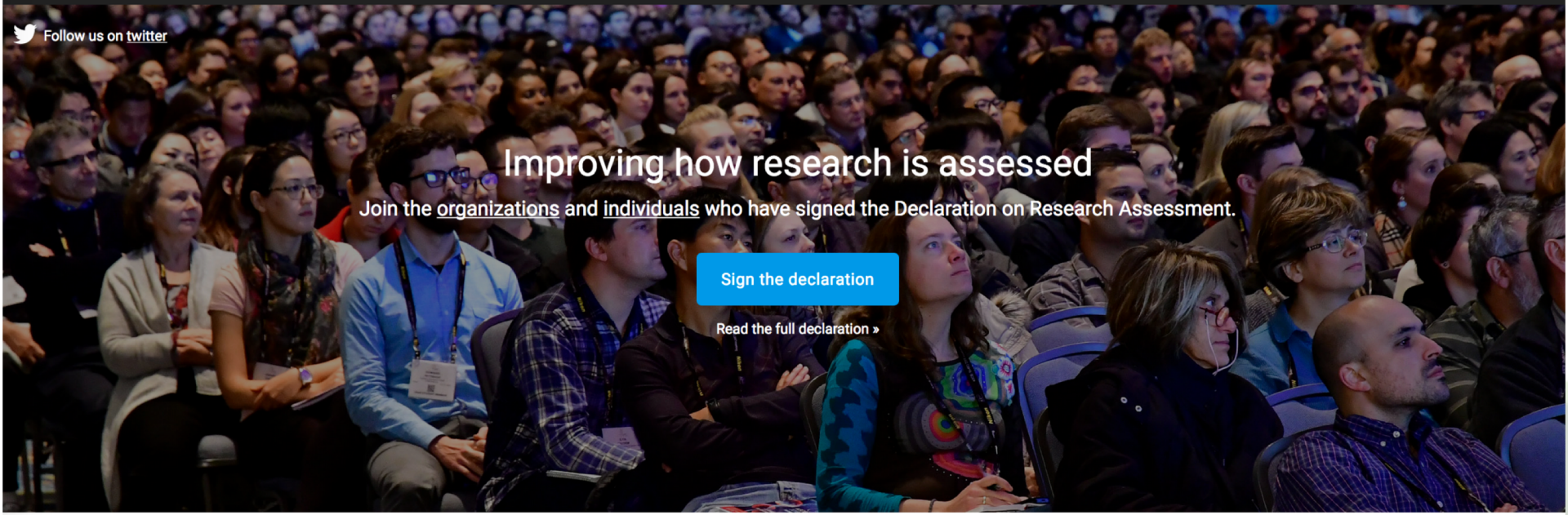


Latest news

Improving How We Evaluate Research: How We're Implementing DORA

CANCER RESEARCH UK

Few UK universities have adopted rules against impact-factor abuse

NATURE

OASPA Endorses the Declaration on Research Assessment (DORA)

OASPA

Reducing inequality of opportunity

- Open Infrastructure
- Open Source
- Open Metadata
- Open Data
- Open Access
- Open Citations

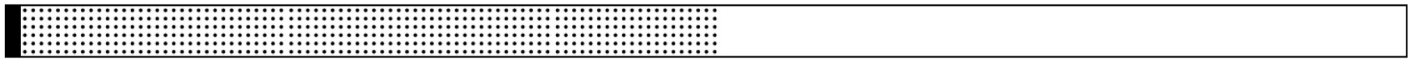
ABC news: http://www.abc.net.au/news/2018-04-13/cultural-capital/9613460 (not sure about copyright)

Weds hack day: Provide a ‘simple’ open source user interface for anyone to query/extract citation data….

The Initiative for Open Citations • I4OC

Making tens of millions of machine-readable citation metadata openly available to everyone, with no copyright restriction.

How many citations are open today?



As of January 2018, the fraction of publications with open references has grown from 1% to more than 50% out of 38 million articles with references deposited with Crossref.

I4OC

Cultural Change

Top-down

Policy
Technology
Infrastructure

Government
Funders
Institutions
Publishers
Researchers
Public

People

Bottom-up

By NASA/Apollo 17 crew; taken by either Harrison Schmitt or Ron Evans - http://web.archive.org/web/20160112123725/http://grin.hq.nasa.gov/ABSTRACTS/GPN-2000-001138.html (image link);

Thank you

C.J. MacCallum (2018) Open Citations as Academic & Cultural Capital: reducing inequality in the communication & evaluation of science *Bologna Open Citations Workshop 3-4th Sept 2018* [CC BY 4.0]*

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The I4OC stakeholders (i4oc.org/#stakeholders) *and participating publishers* (i4oc.org/#publishers)

**Except where noted on the slide*

I4OC

Hypercompetition

- false discoveries can be generated by perfectly well-intentioned researchers. These are easy to spot when the results are absurd [ref 55]:

One mature Atlantic Salmon (Salmo salar) participated in the fMRI study. The salmon was approximately 18 inches long, weighed 3.8 lbs, and was not alive at the time of scanning. The task administered to the salmon involved completing an open-ended mentalizing task. The salmon was shown a series of photographs depicting individuals in social situations with a specified emotional valence. The salmon was asked to determine what emotion the individual in the photo must have been experiencing. Stimuli were presented in a block design with each photo presented for 10 seconds followed by 12 seconds of rest. A total of 15 photos were displayed. Total scan time was 5.5 minutes.

Smaldino, Paul E., and Richard McElreath. "The Natural Selection of Bad Science." Royal Society Open Science 3, no. 9 (September 21, 2016). https://doi.org/10.1098/rsos.160384.