

Something about measuring and evaluating science

Andrea Saltelli

Centre for the Study of the Sciences and the Humanities
(SVT), University of Bergen (UIB), and Open Evidence
Research, Open University of Catalonia



MNF990 / Theory of Science and Ethics, Bergen,
HIB Lille aud, Thormøhlens gate 55, February 13, 2020

&

VITSV900 Philosophy of Social Science and Ethics,
Vatnahalsen, February 19, 2020

Where to find this talk: www.andreasaltelli.eu

Andrea
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NEVER PARIBUS

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Replying to @AndreaSaltelli @merionwest
... and these are 6 m worth watching from Slavoj
Žižek [youtube.com/watch?v=TVwKjG...](https://www.youtube.com/watch?v=TVwKjG...)

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Jul 26, 2019

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~ 2.2 million
articles a year
(2016) over
~ 30,000 journals

newsblog

Nature brings you breaking news from the world of science

NEWS BLOG

Global scientific output doubles every nine years

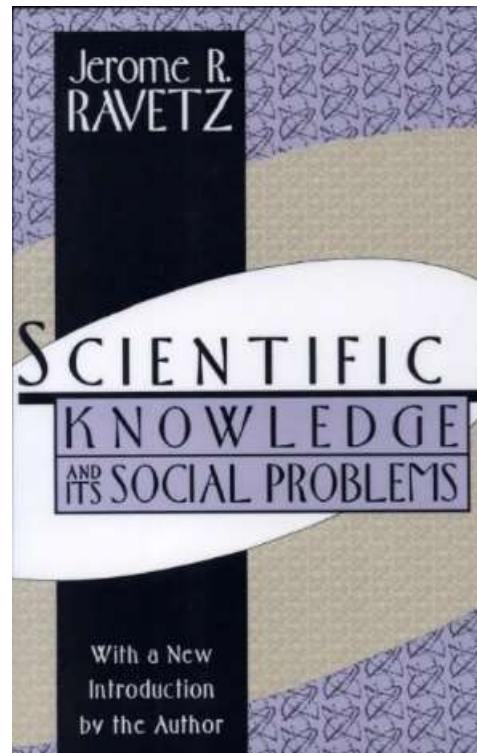
07 May 2014 | 16:46 GMT | Posted by Richard Van
Noorden | Category: Policy, Publishing

<https://www.aje.com/en/arc/scholarly-publishing-trends-2016/>

<http://blogs.nature.com/news/2014/05/global-scientific-output-doubles-every-nine-years.html>

p.22: [...] The problem of quality control in science is at the centre of the social problems of the industrialized science of the present period.”

Ravetz, J., 1971, Scientific Knowledge and its Social Problems, Oxford University Press.



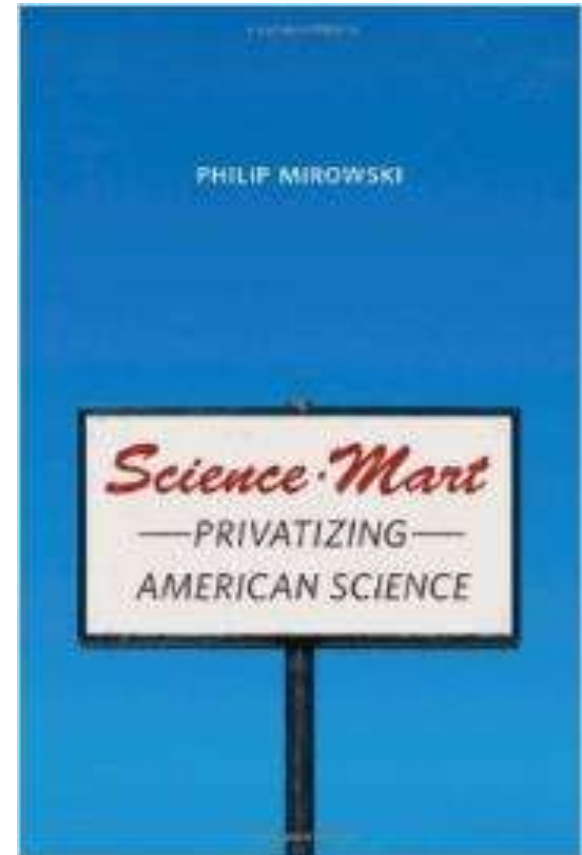
Jerome R.
Ravetz

... neoliberal ideologies lead to decreasing state funding of science, which becomes privatized ... knowledge as a monetized commodity replaces knowledge as a public good → collapse of quality



Philip Mirowski

Mirowski, P. 2011. Science-Mart: Privatizing American Science, Harvard University Press.



... and the matter is complex even
in the context of evaluating
research impact:

Table 1 Philosophical assumptions underpinning approaches to research impact

Perspective	Positivist	Constructivist	Realist	Critical	Actor-Network Theory
Assumptions about what [research] knowledge is	Facts (especially statements on relationships between variables), independent of researchers and transferable to new contexts	Explanations/interpretations of a situation or phenomenon, considering the historical, cultural and social context	Studies of how people interpret external reality, producing statements on 'what works for whom in what circumstances'	Studies that challenge the status quo; focus on the changing 'actor-scenario' and how this gets stabilised in the network	is brought into existence through interactions in practice networks of people and things
Assumed purpose of research	Predictive generalisations ('laws')	Meaning: perhaps in a single, unique case	Theoretical (value-free)	Development of critical consciousness; partnership-building; lobbying; advocacy	Understanding what gave rise to a situation; how it changes over time
Preferred research methods	Hypothesis-testing; experiments; modelling and measurement	Naturalistic inquiry (i.e. in real-world conditions)			
Assumed way to achieve quality in research	Hierarchy of preferred study designs; standardised instruments to help eliminate bias				
Assumed relationship between science and values					Controversial; arguably, Actor-Network Theory is consistent with a value-laden view of science
Assumed mechanism through which impact achieved					'Translations' (stable changes in the actor-network), achieved by actors who mobilise other actors into new configurations
Implications for the study of research impact			Impact studies should address variability in uptake and use of research by exploring context-mechanism-outcome-impact configurations	Impact has a political dimension; research may challenge the status quo; some stakeholders stand to lose power, whereas others may gain	For research to have impact, a re-alignment of actors (human/technological) is needed; focus on the changing 'actor-scenario' and how this gets stabilised in the network

Greenhalgh et al. BMC Medicine (2016) 14:78
DOI 10.1186/s12916-016-0620-8

REVIEW

Research impact: a narrative review

Trisha Greenhalgh^{1*}, James Raftery², Steve Hanney³ and Matthew Glover³

BMC Medicine

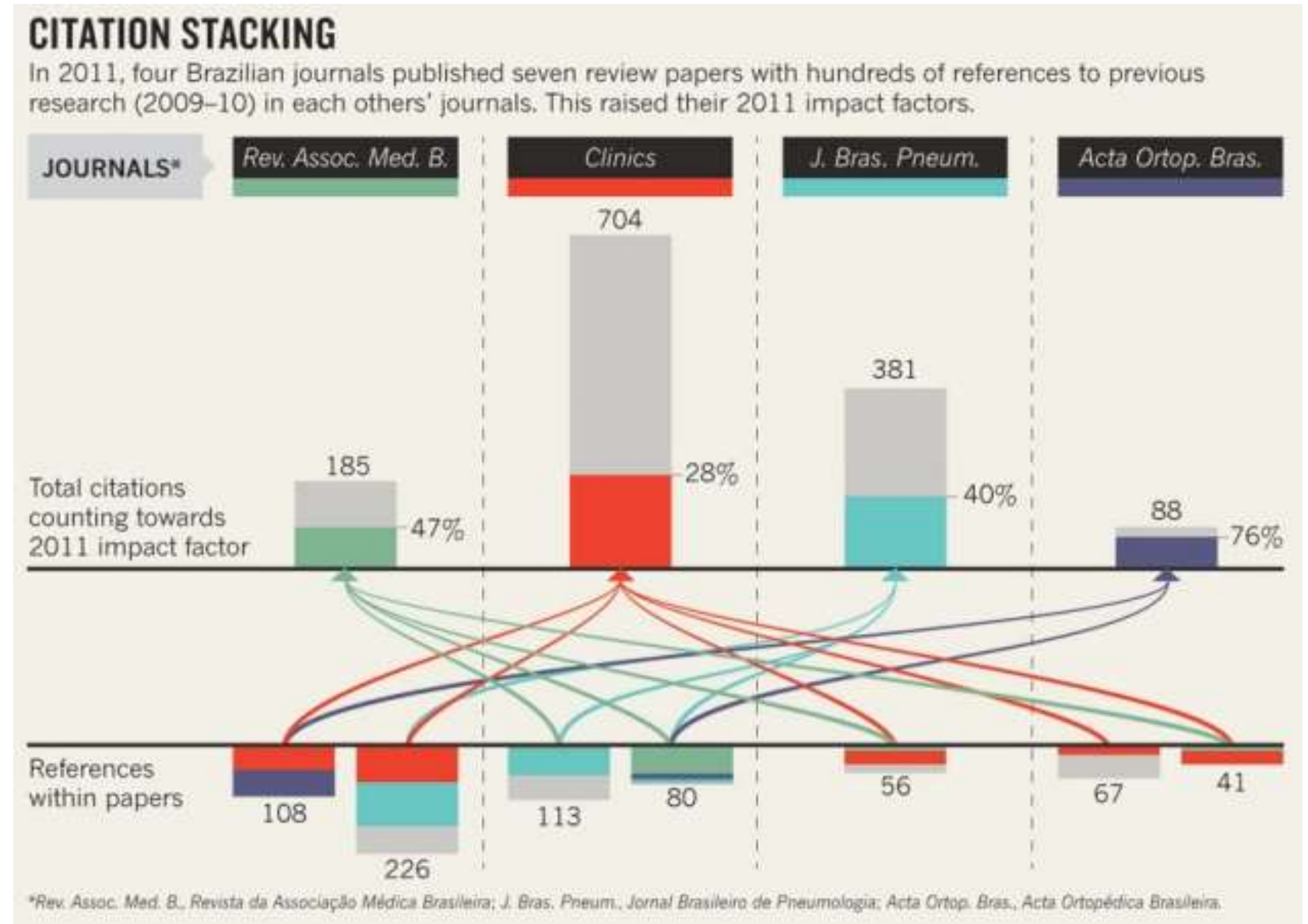
Open Access



CrossMark

Use of metrics

Use and abuse of metrics: from self-citation to citation cartels to citation stacking



Richard Van Noorden, 2017, Brazilian citation scheme outed. Thomson Reuters suspends journals from its rankings for 'citation stacking'. Nature, 27 August 2013

Calls for change in the culture of metrics use

- San Francisco Declaration on Research Assessment (DORA)
- The Leiden Manifesto
- The Metric Tide
- Plan S and cOAlition S for open science
- ...

The Metric Tide



Report of the Independent Review
of the Role of Metrics in Research
Assessment and Management

JAMES WILSDON

July 2015

http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/Independentresearch/2015/The,Metric,Tide/2015_metric_tide.pdf

Note: this is part of Research Excellence Framework (REF)

San Francisco declaration, (2012), signed by 15006 individuals, and 1565 organizations (26/11/2019)

“Do not use journal-based metrics, such as Journal Impact Factor, as a surrogate measure of the quality of individual research articles to assess an individual scientist’s contributions, or in hiring, promotion, or funding decisions”

Declaration: <http://ascb.org/dora/> ; Lancet, Editorial, 2015, Rewarding true inquiry and diligence in research, 385, p. 2121; Wilsdon, J., 2015, We need a measured approach to metrics, Nature, 523, 129; See also <http://ethics-and-integrity.net/>

How to Make More Published Research True (Ioannides 2014)

John P. A. Ioannides



“Modifications [] in the reward system for science, affecting the exchange rates for currencies (e.g., publications and grants) and purchased academic goods (e.g., promotion and other academic or administrative power) and **introducing currencies that are better aligned with translatable and reproducible research**”

Ioannidis, J. P. (2014). How to Make More Published Research True. PLoS medicine, 11(10), e1001747.

How about lotteries?





nature

NEWS • 20 NOVEMBER 2019

David Adam

Science funders gamble on grant lotteries

A growing number of research agencies are assigning money randomly.



What can one learn from the Health Research Council of New Zealand?



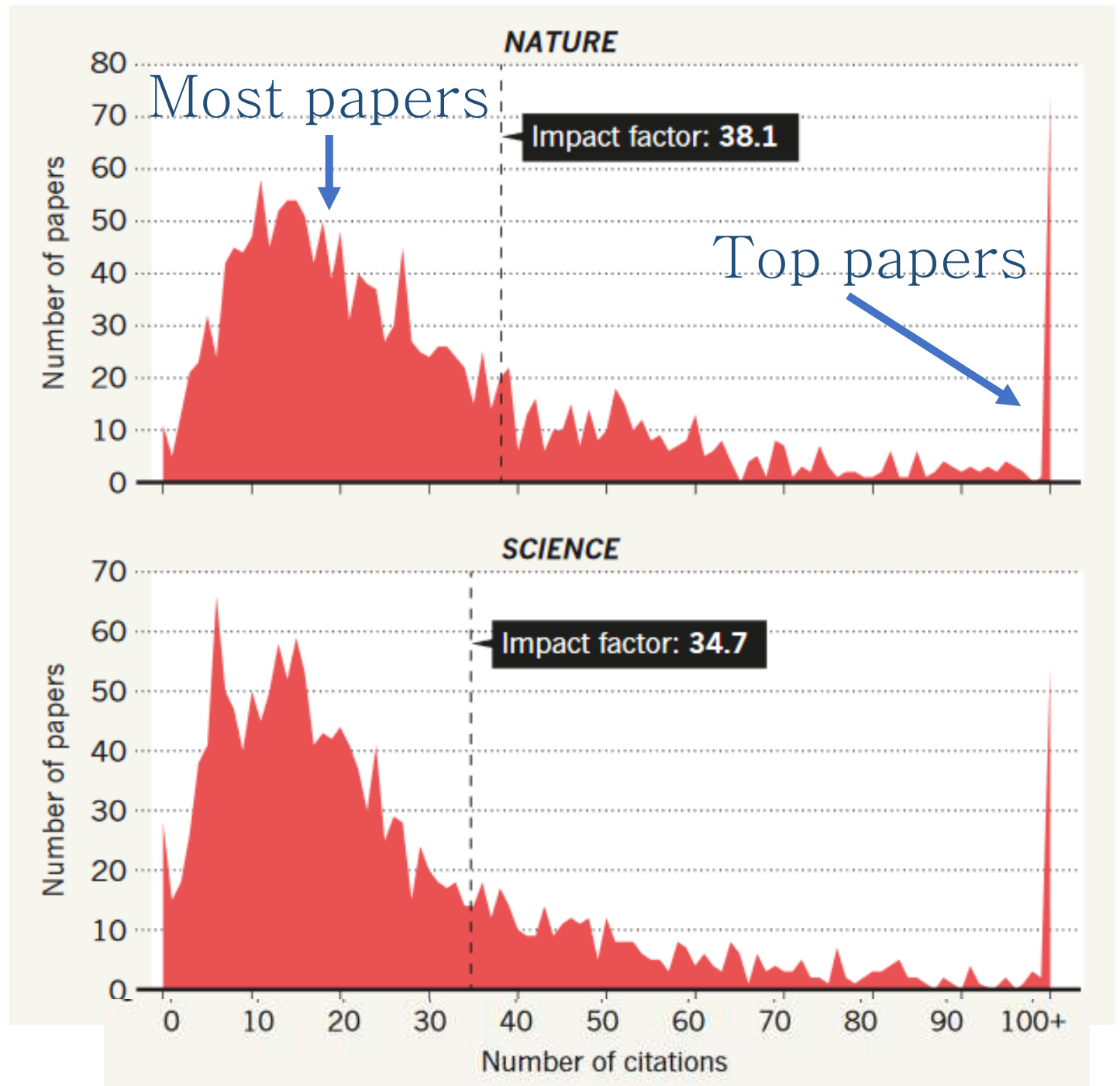
How to avoid borrowed plumes in academia

Margit Osterloh  , Bruno S. Frey 

The impact factor is a misleading measure
of the importance of an individual article.

The average paper is cited much less than the journal's impact factor

Source: E.
Callaway, 2014
Publishing elite turns
against impact factor,
Nature, 535, 210-211.



Impact factors' resilience due to a combination of:

- Incumbents' support (by those up the ladder)
- Goodhart Law (misplaced goal, gaming the measure)
- Existing institutional bureaucracies



Research Policy

Volume 49, Issue 1, February 2020, 103831



How to avoid borrowed plumes in
academia

Margit Osterloh  , Bruno S. Frey 

“Our own proposal to overcome the performance paradox and the lock-in effect is based on the insight that uncertainty about future success is symptomatic of scholarly work. This insight can be liberating”



Research Policy

Volume 49, Issue 1, February 2020, 103831



How to avoid borrowed plumes in
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Papers/project unanimously
approved – published/accepted
as such

Papers/project unanimously
disliked – rejected

All the rest: lottery



Research Policy
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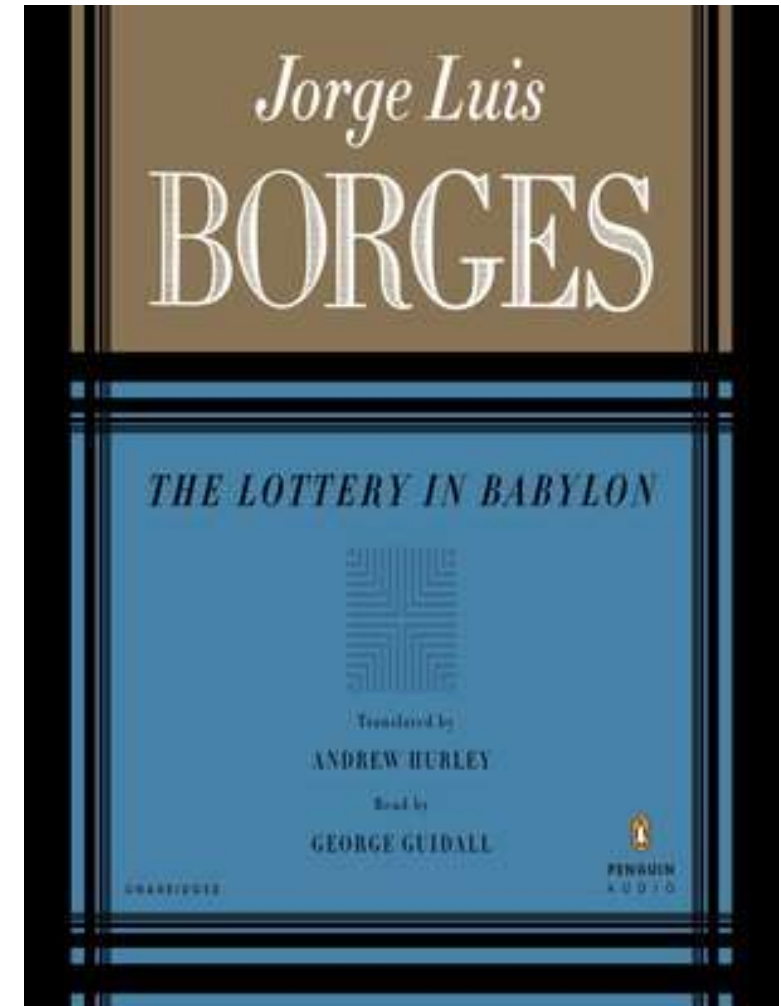
How to avoid borrowed plumes in
academia [Margit Osterloh](#)  , [Bruno S. Frey](#) 

- Reduce conservative bias
- Encourage non orthodox submissions
- Reduce losers' disappointment
- Temper winners' hubris

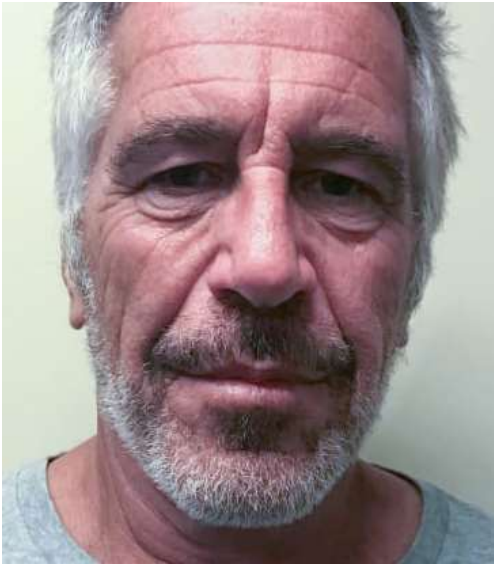
Isn't the publishing / winning process
already a lottery?



Adam Ruben, 2017,
Another tenure-track
scientist bites the dust,
Science,
<https://www.sciencemag.org/careers/2017/07/another-tenure-track-scientist-bites-dust>



“Tainted donation”



Jeffrey Epstein
& paedophilia



Sackler family
& opioids



Koch brothers
& climate

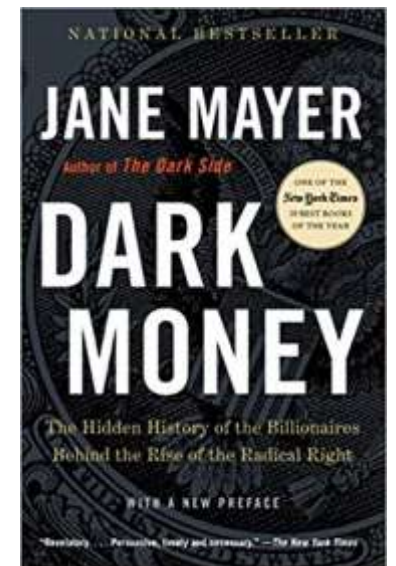
How Rich Donors Like Epstein (and Others) Undermine Science

ADAM ROGERS

SCIENCE

09.15.2019 07:00 AM

WIRED



Philanthropes fixing science



John and
Laura Arnold



Brian Nosek, the
Reproducibility
Project.



John Ioannidis, Meta-
research innovation
centre at Stanford



Ben Goldacre,
alltrials.net



Gary Taubes, The
case against sugar

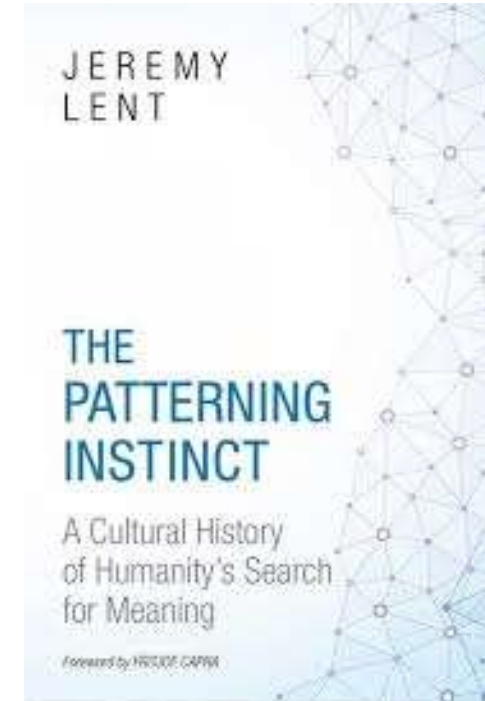
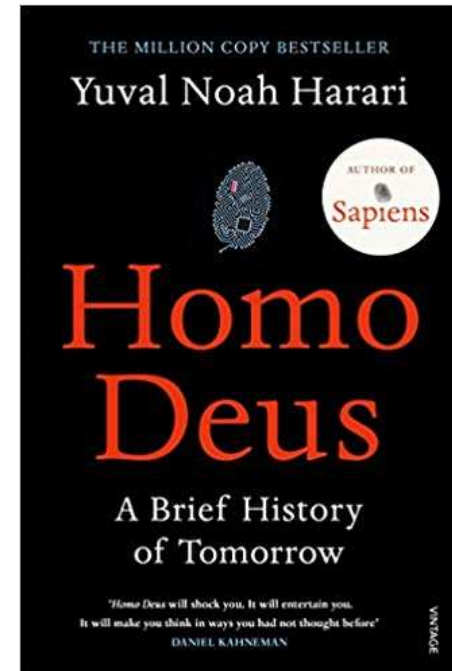
<https://www.wired.com/2017/01/john-arnold-waging-war-on-bad-science/>

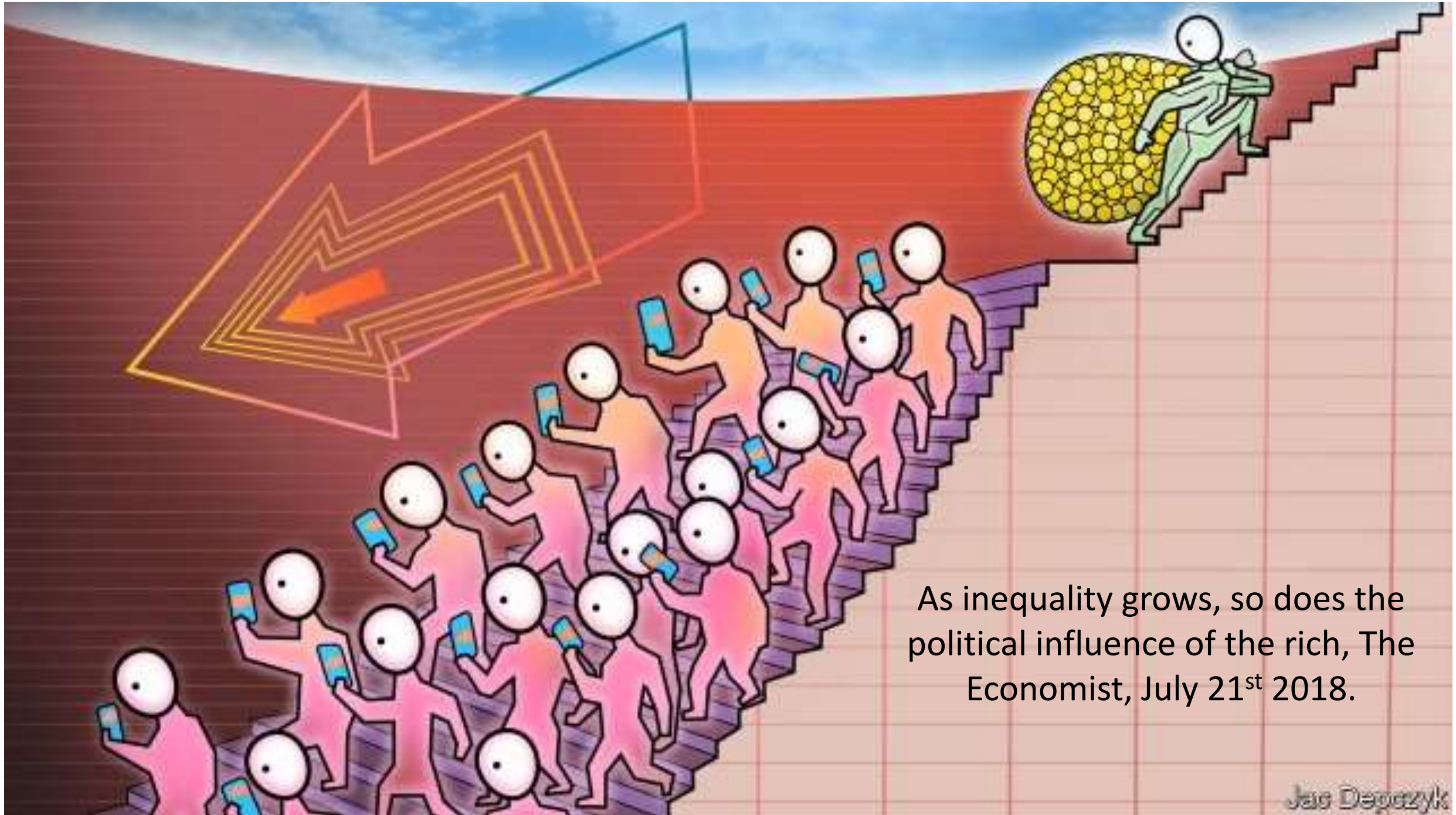
Techno-spit scenario?

An affluent super-technological and possibly trans-human/immortal minority, versus a useless and distracted majority left glued to its mobile phones and tablets

Y. N. Harari, Homo Deus : a brief history of tomorrow. Harvill Secker , 2016.

J. R. Lent, The patterning instinct : a cultural history of humanity's search for meaning. Prometheus Books, 2017.





As inequality grows, so does the
political influence of the rich, The
Economist, July 21st 2018.

The End



@andreasaltelli