

Integrity at times of crisis

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



INPhINIT PhD training sessions,
Girona, CaixaForum, 26/02/2020

Where to find this talk: www.andreasaltelli.eu

Andrea
Saltelli

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CAETERIS ARE
NEVER PARIBUS

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

YouTube @YouTube



Jul 26, 2019



andrea saltelli
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Open Science

Open science is complex and conflicted

Existing tensions and historical perspective

The take of Mirowski

If open science is the solution which was the problem?

- The non accessibility of research funded with taxpayer money?
- A disaffection / loss of trust of citizens for science / expertise?
- Predatory publishing?
- Science's own reproducibility crisis?

Ethical issues

Evidence based policy and its problems

What is the role of quantification ?

Post truth

Orwell or Huxley? Techno-split

Open science as a
contested and conflicted
field

A plurality of schools of
thought



frontiers
in Big Data

PERSPECTIVE ARTICLE

Front. Big Data, 10 December 2019 | <https://doi.org/10.3389/fdata.2019.00043>

Open Science, Open Data, and Open Scholarship: European Policies to Make Science Fit for the Twenty-First Century

Jean-Claude Burgelman, Corina Pascu*, Katarzyna Szkuta, Rene Von Schomberg, Athanasios Karalopoulos, Konstantinos Repanas and Michel Schouppe*

Plan S

Making full and immediate Open Access a reality

Why Plan S

Principles and Implementation

Who's involved





Jefferson Pooley
February 21st,
2020

Read-and-Publish Open Access deals
are heightening global inequalities in
access to publication.



Jefferson Pooley, February 21st, 2020, blogs.lse.ac.uk/:
Plan S accelerates read-and-publish deals in the Global North. They lock in and exacerbate existing inequalities in scholarly publishing.

Open science is a quest for
democratic right to access publicly funded
knowledge (e.g. Open Access to publications) ...
... a demand for a better bridging of the divide
between research and society (e.g. citizen
science)

B. Fecher and S. Friesike, “Open Science: One Term, Five Schools of
Thought,” in Opening Science, S. Bartling and S. Friesike, Eds. Springer

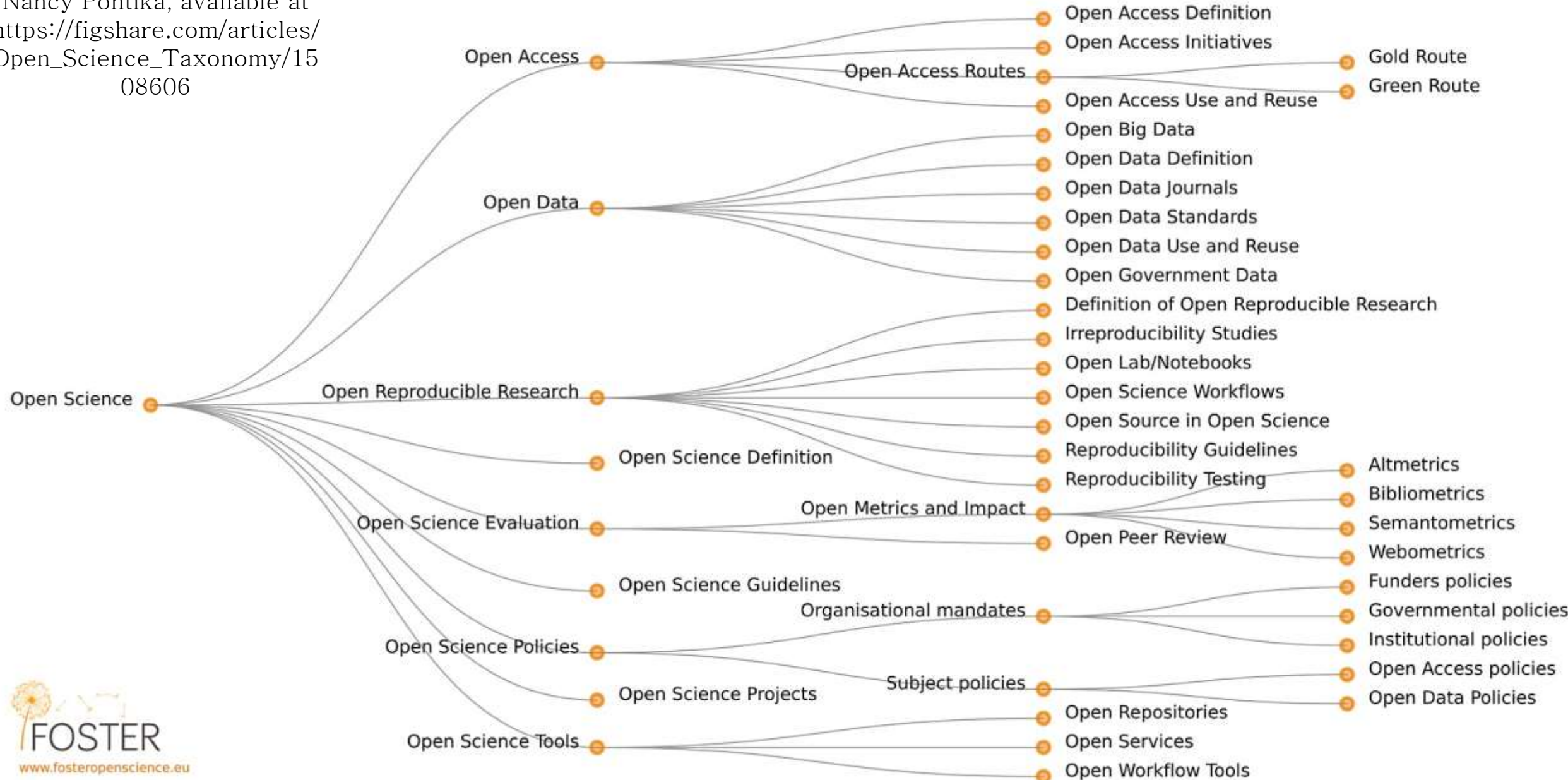
… the development of freely available tools for collaboration (e.g. social media platforms for scientists)… and more.



B. Fecher and S. Friesike, “Open Science: One Term, Five Schools of Thought,” in Opening Science, S. Bartling and S. Friesike, Eds. Springer

Open Science Taxonomy

Figure from Petr Knoth and
Nancy Pontika, available at
[https://figshare.com/articles/
Open_Science_Taxonomy/15
08606](https://figshare.com/articles/Open_Science_Taxonomy/1508606)



For Paul David open science was always a fragile social construction ...

... resulting from the movement away from secret knowledge and princely patronage toward state patronage, academies, and other modern institutions of science, taking place in the period between renaissance and the industrial revolution

P. A. David, "The Historical Origins of 'Open Science': An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution," *Capital. Soc.*, vol. 3, no. 2, p. Article 5, 2008.

What was before open science?

"Regarding the everyday duties, I shun only that type of prostitution consisting of having to expose my labor to the arbitrary prices set by every customer. Instead, I will never look down on service a prince or a great lord or those who may depend on him, but, to the contrary, I will always desire such a position."
(Galileo Galilei, 1564 – 1642)



P. A. David, "The Historical Origins of 'Open Science': An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution," *Capital. Soc.*, vol. 3, no. 2, p. Article 5, 2008.

Open science exists already, funded by public and private actors, based on a distinctive ethos

It coexists with commercially oriented research

P. A. David, “The Historical Origins of ‘Open Science’: An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution,” *Capital. Soc.*, vol. 3, no. 2, p. Article 5, 2008.

The ethos of open science:
CUDOS, by R.K. Merton, a
system of universal norms



Robert K. Merton

R. Merton, The sociology of science: Theoretical and empirical investigations, 1973.

Communalism – the common ownership of scientific discoveries, according to which scientists give up intellectual property rights in exchange for recognition and esteem (Merton actually used the term Communism, but had this notion of communalism in mind, not Marxism);

Universalism – according to which claims to truth are evaluated in terms of universal or impersonal criteria, and not on the basis of race, class, gender, religion, or nationality;

Disinterestedness – according to which scientists are rewarded for acting in ways that outwardly appear to be selfless;

Organized Skepticism – all ideas must be tested and are subject to rigorous, structured community scrutiny.

Journal of Empirical Research on Human Research Ethics

Normative Dissonance in Science: Results from a National Survey of U.S. Scientists

Melissa S. Anderson, Brian C. Martinson, Raymond De Vries

First Published December 1, 2007 | Research Article | [Find in PubMed](#)

<https://doi.org/10.1525/jer.2007.2.4.3>

survey responses from 3,247 mid- and early-career scientists who had research funding from the U.S. National Institutes of Health

Norm

Communality: Scientists openly share findings with colleagues.

Counter-norm

Secrecy: Scientists protect their newest findings to ensure priority in publishing, patenting, or applications.

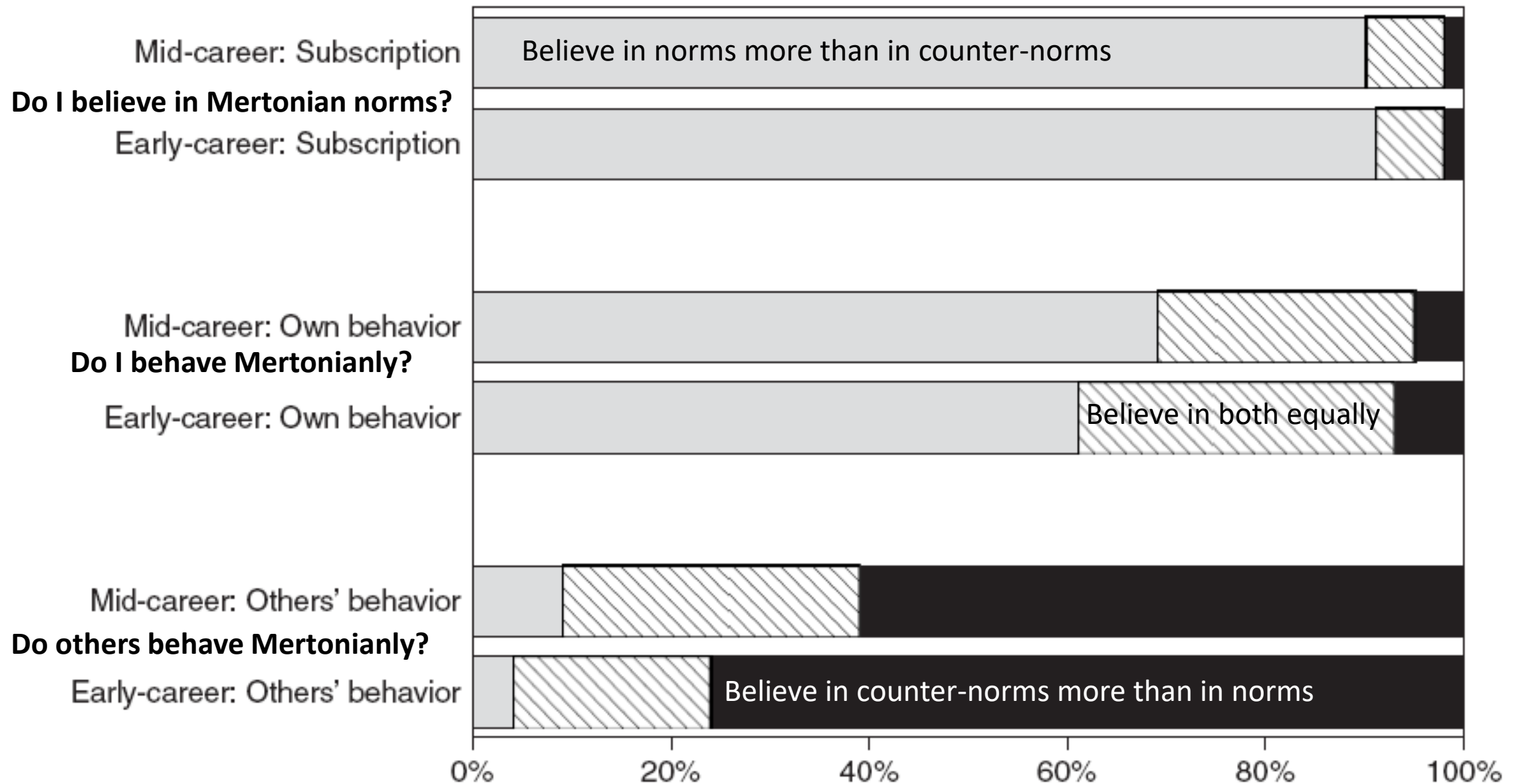


FIG. 3. Norm versus Counternorm Scores: Percent with Norm > Counternorm (dotted), Norm = Counternorm (striped), Norm < Counternorm (solid).

The republic of science, by Michal Polanyi; science and cold war, the market for ideas, science as self-policing...



Sputnik 1, 1957

Michal Polanyi



M. Polanyi, J. Ziman, and S. Fuller, 1962, "The republic of science: its political and economic theory," *Minerva*, vol. 38, pp. 1-32.

Back to open science: a tension between:

Defending the existing ethos of the republic of science, Merton's CUDOS, "public knowledge"

Proprietary science, secrecy, visions of a knowledge economy

P. A. David, "The Historical Origins of 'Open Science': An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution," *Capital. Soc.*, vol. 3, no. 2, p. Article 5, 2008.

An acceleration toward ‘Intellectual Capitalism’
risks to move science back to the age of
princely patronage ...

... from CUDOS back to the pre-renaissance
ethos of secrecy in the pursuit of Nature’s
Secrets

P. A. David, “The Historical Origins of ‘Open Science’: An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution,” *Capital. Soc.*, vol. 3, no. 2, p. Article 5, 2008.

What Philip Mirowski has to say about the dangers of open science

Article



S|S|S

The future(s) of open science

Philip Mirowski 

John J. Reilly Center, University of Notre Dame, Notre Dame, IN, USA

Social Studies of Science
2018, Vol. 48(2) 171–203

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DOI: 10.1177/0306312718772086

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 **SAGE**

“the agenda [of open science] is effectively to re-engineer science along the lines of platform capitalism, under the misleading banner of opening up science to the masses”

Article

S|S|S

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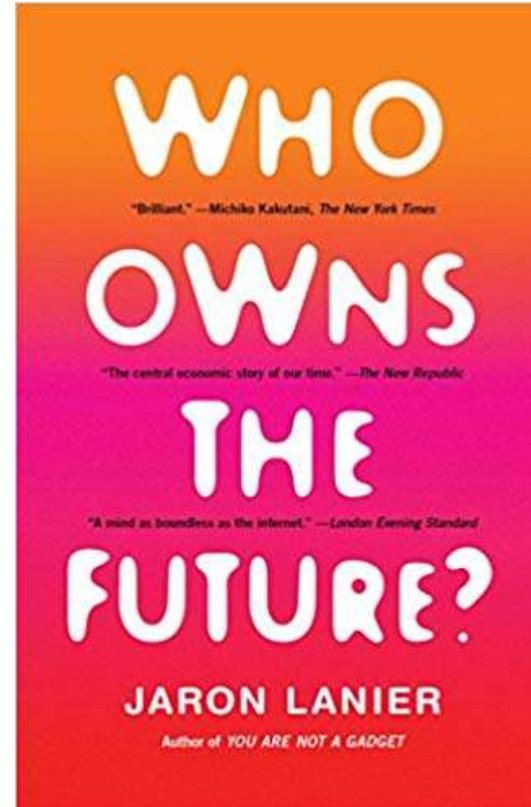
 SAGE

Platform capitalism?

It is good!



It is bad!



“the open science movement is an artifact of the current neoliberal regime of science, [to] reconfigures both the institutions and the nature of knowledge to better conform to market imperatives”



Article

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Open science is not there to solve

- Distrust of science in the general population
- Science's democracy deficit
- Slowdown in scientific productivity
- Reproducibility crisis

Article

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2018, Vol. 48(2) 171–203

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How a neoliberal agenda has damaged science

Article

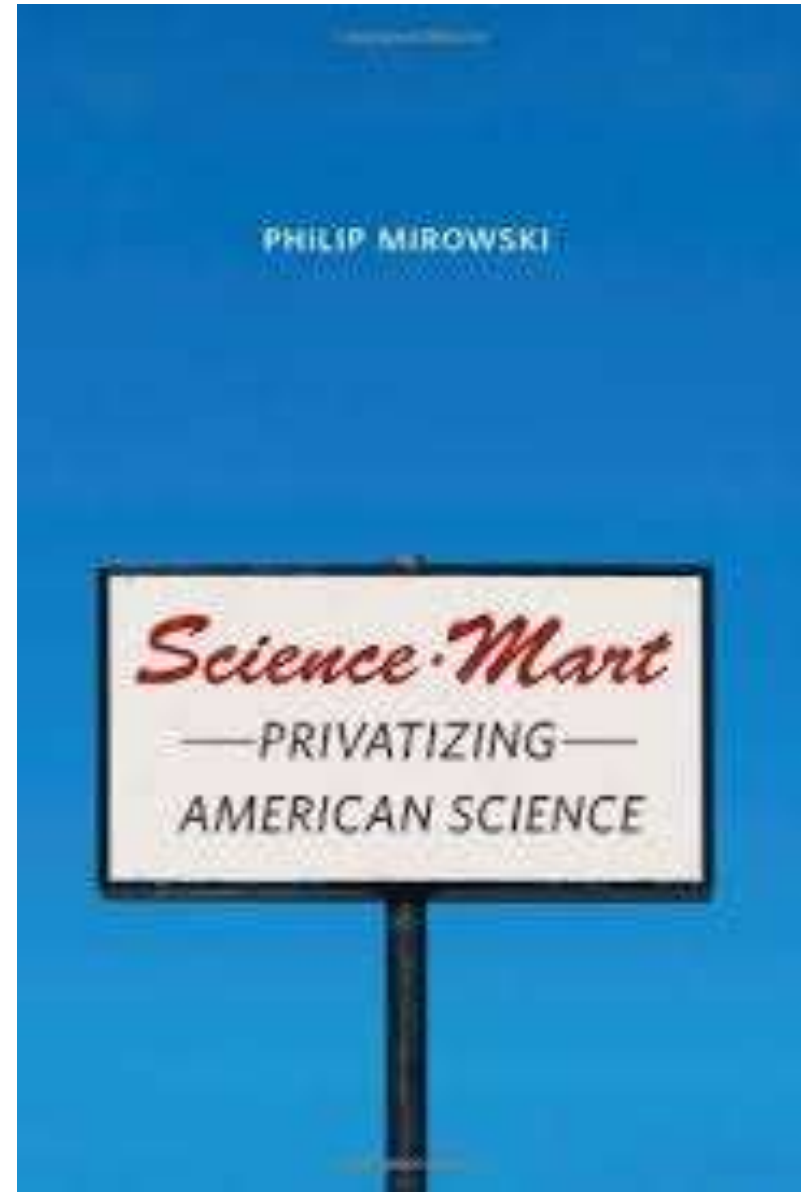
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John J. Reilly Center, University of Notre Dame, Notre Dame, IN, USA

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What is hence the danger for Mirowski?

Platform capitalism and the uberization of science

Article

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The future(s) of open science

Philip Mirowski 

John J. Reilly Center, University of Notre Dame, Notre Dame, IN, USA

Social Studies of Science

2018, Vol. 48(2) 171–203

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 SAGE

Platforms competing to become the ‘Facebook for Science’



The future is with us already we as scientists already live in “a quasi-market that constantly monitors [our] ‘net worth’ through a range of metrics, scores and indicators:

h-index, impact factors, peer contacts, network affiliations, and the like

The future(s) of open science

Philip Mirowski 

John J. Reilly Center, University of Notre Dame, Notre Dame, IN, USA

Social Studies of Science
2018, Vol. 48(2) 171–203
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We already struggle with “author–paid Article Publishing Charges (APCs) that range from \$500 to \$5,000 USD [Elsevier OA]”;

Corporate publishers have easily assimilated open access into their profit model.

Article

SSS

The future(s) of open science

Philip Mirowski 

John J. Reilly Center, University of Notre Dame, Notre Dame, IN, USA

Social Studies of Science
2018, Vol. 48(2) 171–203
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If open science is a
solution which was the
problem?

Predatory publishers (the Achilles heel of the APC model)

Predatory open access publishers

<https://beallslist.net>

Beall was threatened by Omics International with a \$1billion lawsuit



Jeffrey Beall,
librarian,
University
of Colorado,
Denver

Dear Andrea Saltelli,
I hope everything is going well.



Google Cus

We cordial

As you bei

If you have

Hoping

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ISSN: 2575-7091

Food & Nutrition Journal

A photograph of a bowl of fresh green salad with orange slices.

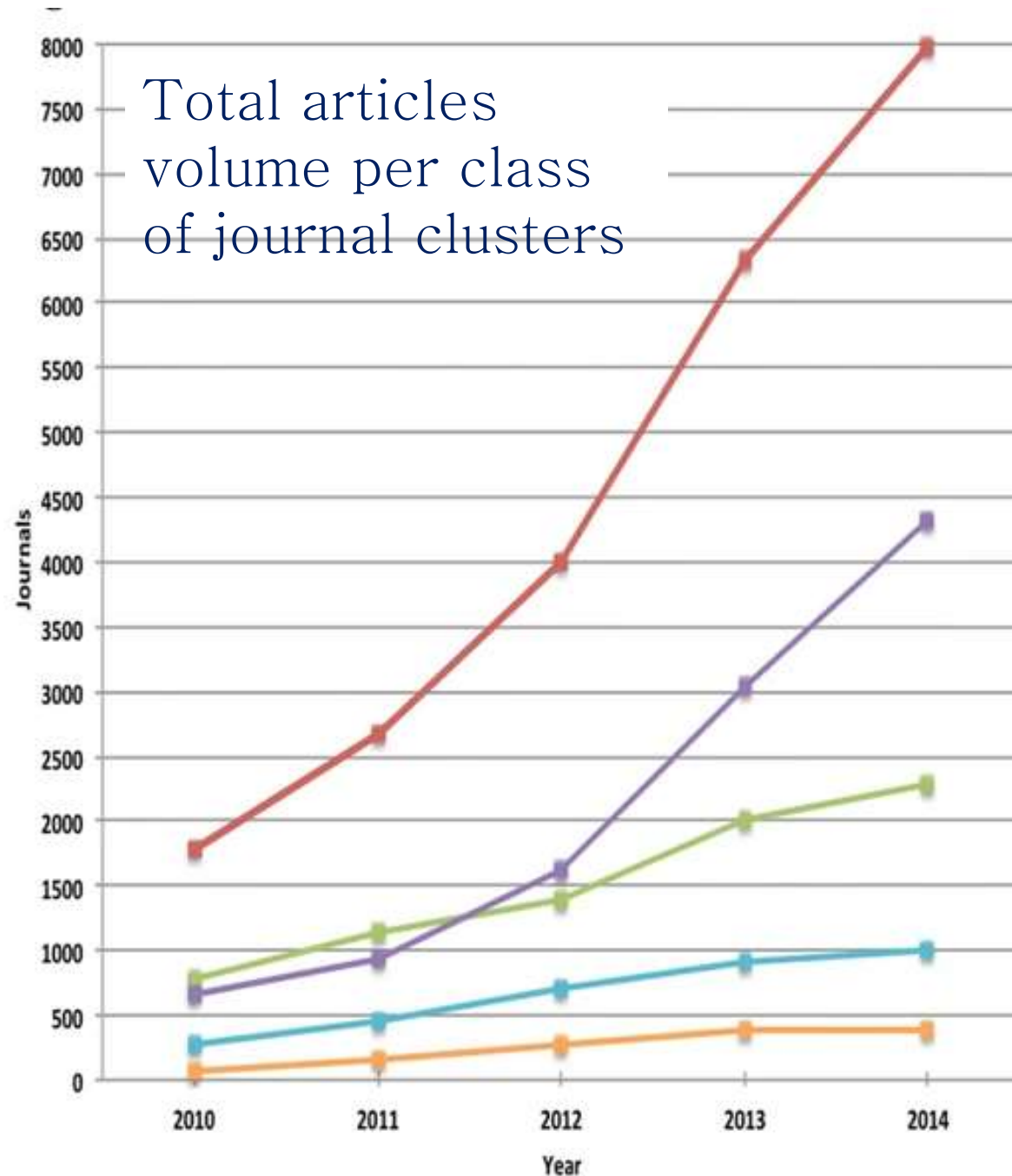
About the Journal

Journal Impact Factor 1.2*

Is on Beall's list ←

- *Genamics – JournalSeek
- *Academic Keys
- *ResearchBib - Academic Research Index
- *Free Medical Journals - Geneva Foundation for Medical Education and Research
- *International Innovative Journal Impact Factor (IIJIF)
- *Al-Azhar University
- *Open J-Gate
- * Directory of Journals indexing

C. Shen and B.-C. Björk, “‘Predatory’ open access: a longitudinal study of article volumes and market characteristics,” BMC Med., vol. 13, no. 1, p. 230, Dec. 2015.



Opinion

Peer review and scientific publishing

Thu 13 Sep 2018

Scientific publishing is a rip-off. We fund the research – it should be free

George Monbiot



Those who take on the global industry that traps research behind paywalls are heroes, not thieves





I. Graber-Stiehl, "Science's pirate queen," *Verge*, Feb-2018.



Kazakhstani scientist
Alexandra Elbakyan



Elsevier profits 2010 = £724m on £2bn revenue: a 36% margin – higher than Apple, Google, or Amazon

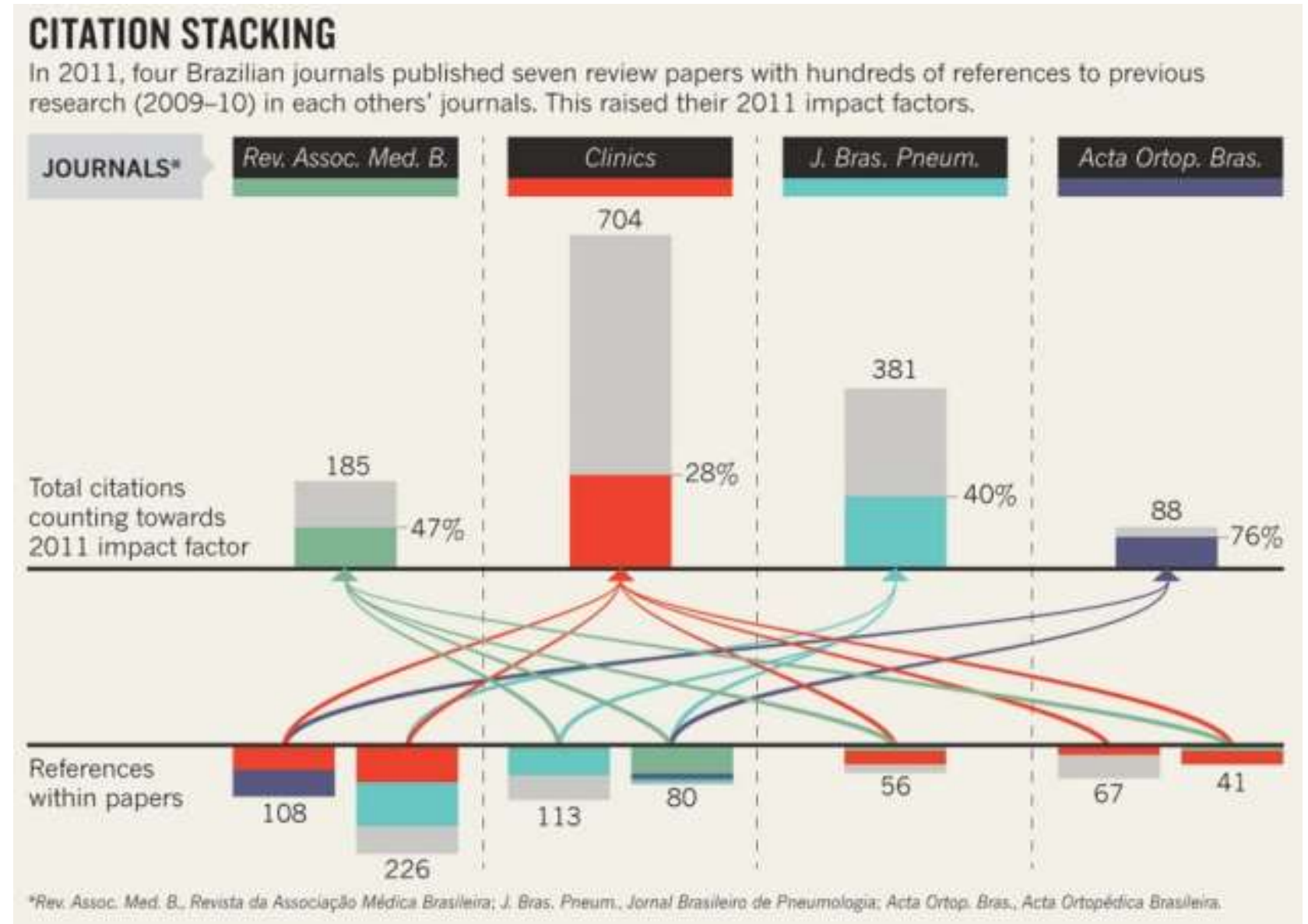
Stephen Buranyi, The Guardian, 27 Jun 2017.



A 2005 Deutsche Bank report referred to it as a “bizarre” “triple-pay” system, in which “the state funds most research, pays the salaries of most of those checking the quality of research, and then buys most of the published product”

Stephen Buranyi, The Guardian, 27 Jun 2017.

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.

More recent initiatives

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The Hong Kong Principles for Assessing Researchers: Fostering Research Integrity



AUTHORS
David Moher, Lex Bouter, Sabine Kleinert, Paul Glasziou, Mai Har Sham, Virginia Barbour, Anne-Marie Coriat, Nicole Foeger, Ulrich Dirnagl

CREATED ON
September 17, 2019


LAST EDITED
November 23, 2019







Page: 1 of 21 Automatic Zoom

¹The Hong Kong Principles for Assessing
²Researchers: Fostering Research Integrity
³
⁴David Moher^{1,2}, Lex Bouter^{3,4}, Sabine Kleinert⁵, Paul Glasziou⁶, Mai Har Sham⁷
⁵Virginia Barbour⁸, Anne-Marie Coriat⁹, Nicole Foeger¹⁰, Ulrich Dirnagl¹¹

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 Alexa von Hagen has endorsed this work.

Abstract

More recent initiatives



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Conflict between Open Access and Open Science: APCs are a key part of the problem, preprints are a key part of the solution

January 21st, 2020, David Mellor, Brian Nosek, Nicole Pfeiffer

Posted in [Scholarly Publishing](#)

More recent initiatives



PROFESSIONAL JOBS EVENTS RANKINGS STUDENT AB



Journal transparency index will be 'alternative' to impact scores

Center for Open Science project will pass judgment on journals' commitment to research transparency

January 29, 2020

By [Jack Grove](#)

Twitter: [@jgro_the](#)

Let's zoom out now and ...

Integrity in the context of...

The crisis of science



...of expertise



Michael Gove seen by FT

... of our relation
with technology



Ulrich Beck

What role does
quantification play
in all that



Crisis in science?
Surely you must be
joking



Futures

Volume 91, August 2017, Pages 5-11



What is science's crisis really about?

Andrea Saltelli ^{a, b}  , Silvio Funtowicz ^a



Futures

Volume 104, December 2018, Pages 85-90



Why science's crisis should not become a political battling ground

Andrea, Saltelli 



Silvio Funtowicz

Failed replications, entire subfields going bad,
fraudulent peer reviews, predatory publishers,
perverse metrics, statistics on trial ...




Brow

 OPEN ACCESS

ESSAY

June 21, 2017

Why Most Clinical Research Is Not Useful

John P. A. Ioannidis 

Published: June 21, 2016 • <https://doi.org/10.1371/journal.pmed.1002049>

THE
ECONOMIC
JOURNAL



The Economic Journal, 127 (October), F236–F265. Doi: 10.1111/eoj.12461 © 2017 Royal Economic Society. Published by John Wiley & Sons, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA.

THE POWER OF BIAS IN ECONOMICS RESEARCH*

John P. A. Ioannidis, T. D. Stanley and Hristos Doucouliagos

October 27, 2017

… misleading science advice, institutions on denial, a new breed of science wars

Opinion: Is science really facing a reproducibility crisis, and do we need it to?

Daniele Fanelli

PNAS March 12, 2018. 201708272; published ahead of print March 12, 2018. <https://doi.org/10.1073/pnas.1708272114>



“The new “science is in crisis” narrative is not only empirically unsupported, but also quite obviously counterproductive”

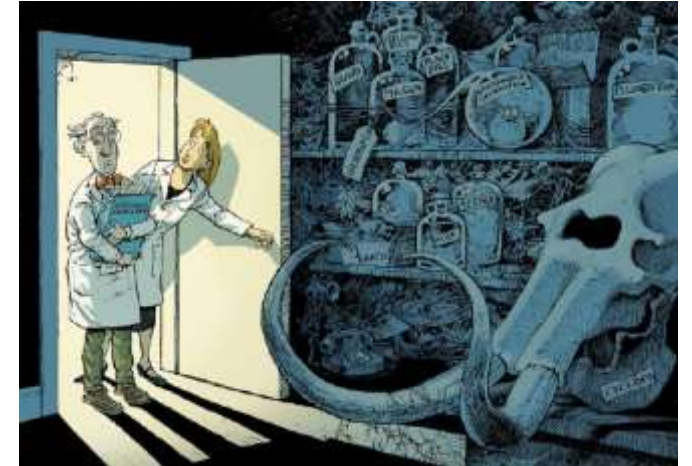
The crisis is methodological,
epistemological, ethical and
metaphysical

COMMENT • 20 MARCH 2019

Scientists rise up against statistical significance

Valentin Amrhein, Sander Greenland, Blake McShane and more than 800 signatories call for an end to hyped claims and the dismissal of possibly crucial effects.

Valentin Amrhein , Sander Greenland & Blake McShane



nature

International journal of science

Statistical wars?

See the discussion on the
blogs of Deborah Mayo

<https://errorstatistics.com/>

and

Andrew Gelman

<https://statmodeling.stat.columbia.edu/>



Powerful drivers: the crisis will be worse before it can be better

Downloaded from <http://rsos.royalsocietypublishing.org/> on September 23, 2016

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Research



Cite this article: Smaldino PE, McElreath R.

2016 The natural selection of bad science.

R. Soc. open sci. **3**: 160384.

<http://dx.doi.org/10.1098/rsos.160384>

Received: 1 June 2016

Accepted: 17 August 2016

The natural selection of bad science

Paul E. Smaldino¹ and Richard McElreath²

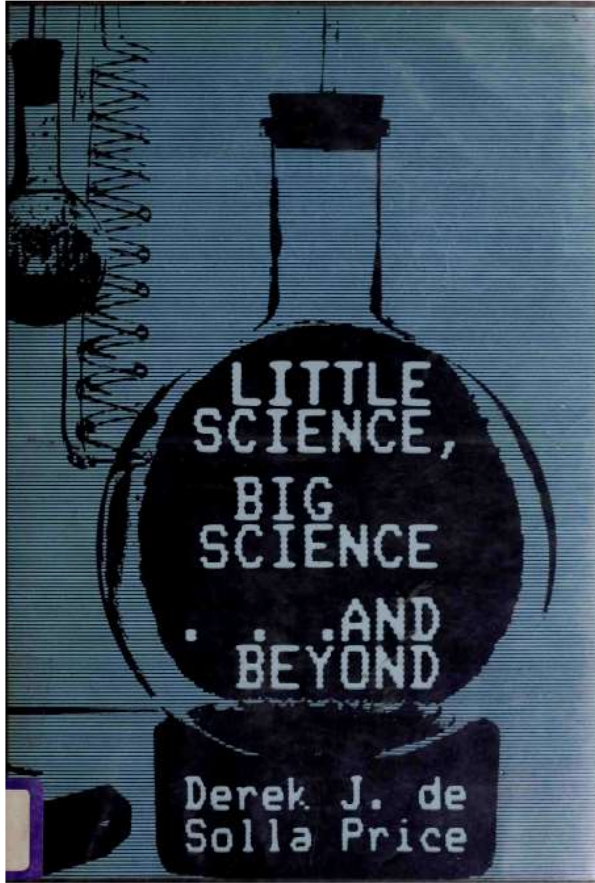
¹Cognitive and Information Sciences, University of California, Merced, CA 95343, USA

²Department of Human Behavior, Ecology, and Culture, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

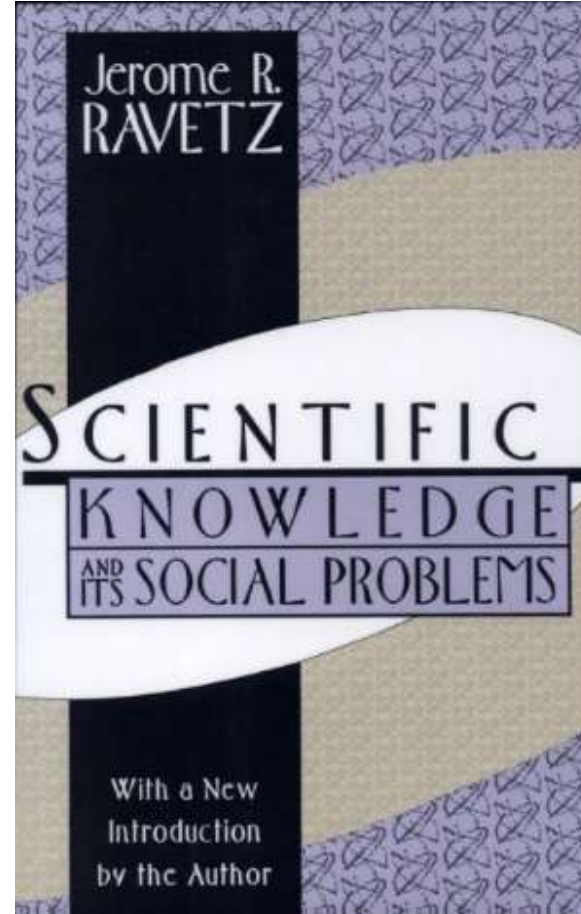
PES, 0000-0002-7133-5620; RME, 0000-0002-0387-5377

Poor research design and data analysis encourage false-positive findings. Such poor methods persist despite perennial calls for improvement, suggesting that they result from something more than just misunderstanding. The persistence of poor methods results partly from incentives that favour them, leading to the natural selection of bad science. This dynamic requires no conscious strategizing—no deliberate cheating nor loafing—by scientists, only that publication is a principal factor for

The crisis was predicted



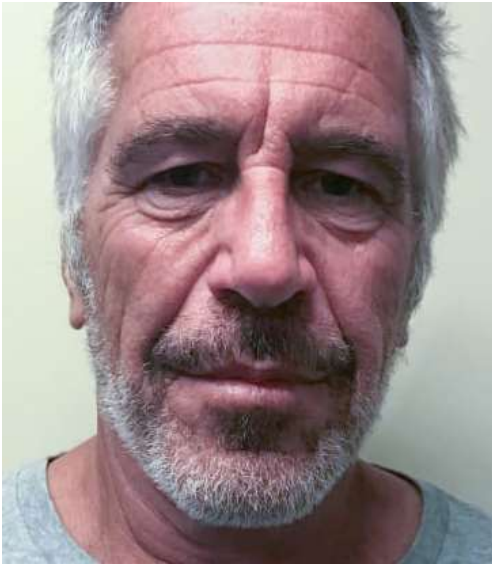
Derek J. de
Solla Price



Jerome R.
Ravetz

de Solla Price, D.J., 1963, Little science big science, Columbia University Press;
Ravetz, J., 1971, Scientific Knowledge and its Social Problems, Oxford University Press.

Ethical issues?
Tainted donations



Jeffrey Epstein
& paedophilia



Sackler family
& opioids



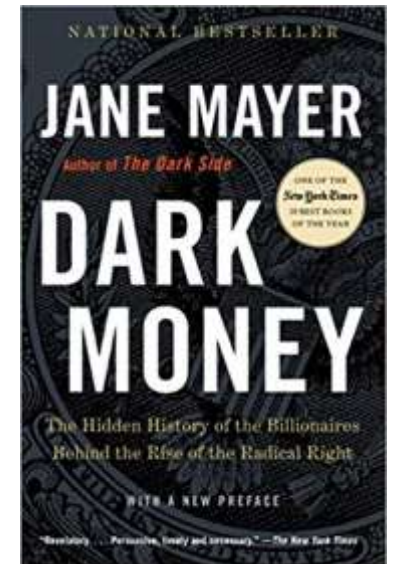
Koch brothers
& climate

How Rich Donors Like Epstein (and Others) Undermine Science

ADAM ROGERS

SCIENCE 09.15.2019 07:00 AM

WIRED



Ethical issues?

Reviewer-coerced citation



NEWS • 06 FEBRUARY 2020

Highly cited researcher banned from journal board for citation abuse

Investigation finds that biophysicist Kuo-Chen Chou repeatedly suggested dozens of citations be added to papers.

Richard Van Noorden

Ethical issues?
Seducing salaries

U.S. Accuses Harvard Scientist of Concealing Chinese Funding



Prosecutors say Charles M. Lieber, the chair of Harvard's chemistry department, lied about contacts with a Chinese state-run initiative that seeks to draw foreign-educated talent.



By **Ellen Barry**

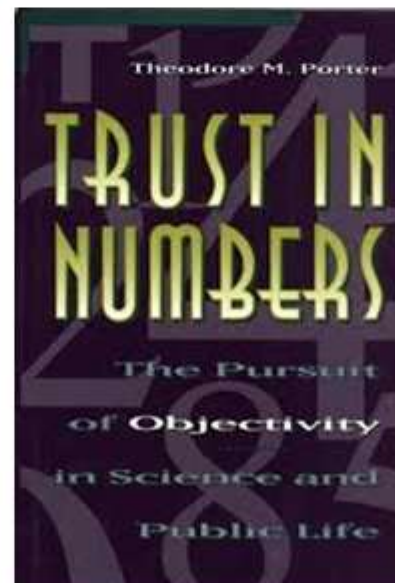
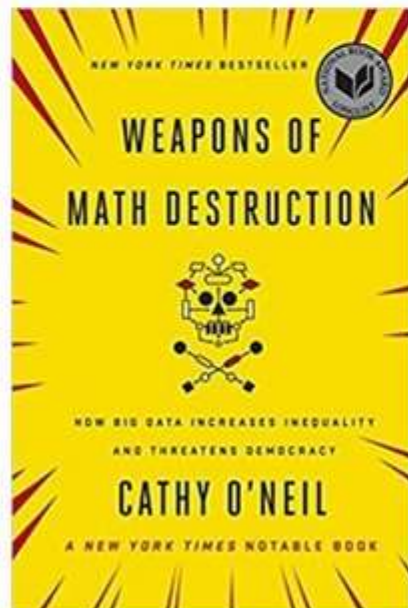
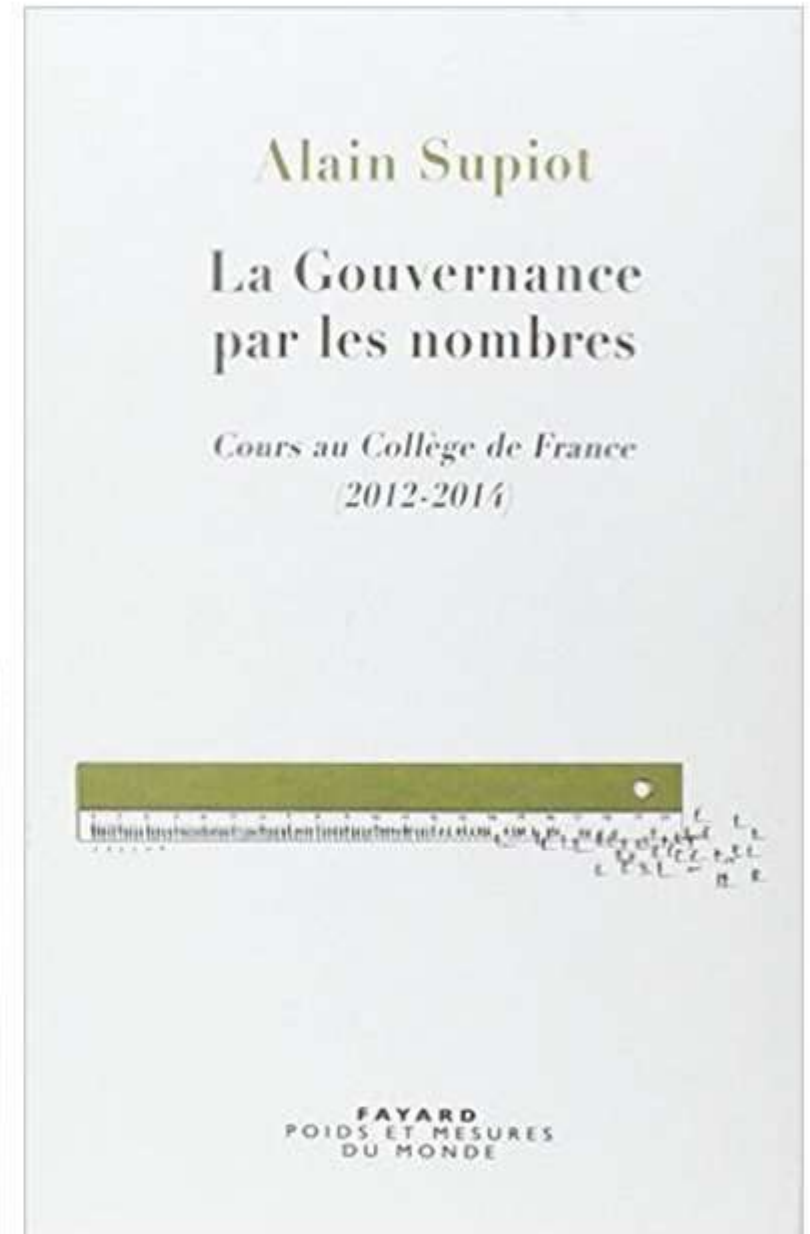
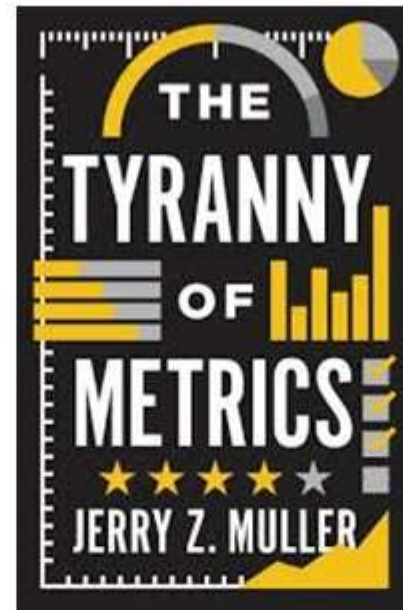
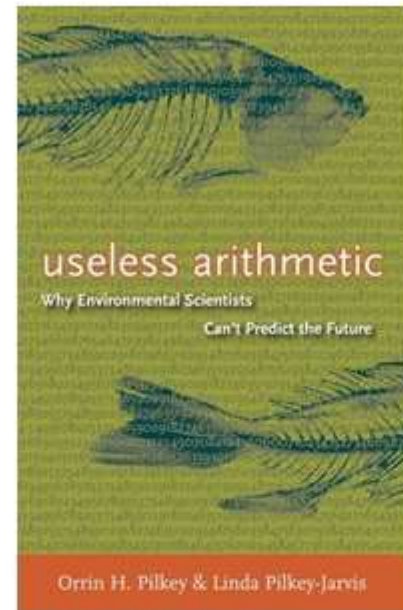
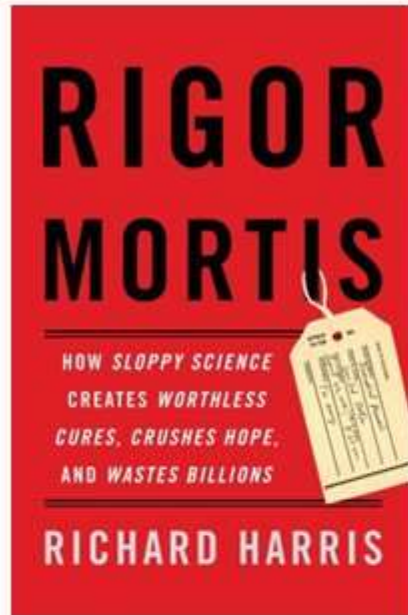
Jan. 28, 2020

“one of Harvard’s scientific luminaries was in handcuffs, ... false statement to federal authorities about his financial relationship with the Chinese ... Thousand Talents program”

\$50,000 monthly salary, \$150,000 in annual in living expenses and more than \$1.5 million for a second laboratory in Wuhan

Quantification?

Algorithms, models, metrics, statistics...





Futures

Volume 116, February 2020, 102509



Essays

Ethics of quantification or quantification of ethics?

Andrea Saltelli

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<https://doi.org/10.1016/j.futures.2019.102509>

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Post truth

The powerful agents of post-truth

Jaron Lanier



Poisonous algorithms to stoke hatred and division

Yuval Noah Harari, Homo Deus 2015 & 21 Lessons for the 21st Century, 2018.

Jaron Lanier, 2018 Ten Arguments for Deleting Your Social Media Accounts Right Now

<https://www.theguardian.com/society/2018/aug/23/russian-trolls-spread-vaccine-misinformation-on-twitter>

"Have you seen those zombies who roam the streets with their faces glued to their smartphones? Do you think they control the technology, or does the technology control them?"

Yuval Noah
Harari



Yuval Harari, 21 Lessons for the 21st Century, 2018, Jonathan Cape publisher; for autopoietic technology see also W. Brian Arthur, 2010, The Nature of Technology, Free Press.



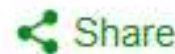
From deepfake to Cambridge Analytica, to algorithmic abuse the scope for damage has expanded

Deepfake videos 'double in nine months'



Rory Cellan-Jones
Technology correspondent
@BBCRoryCJ

🕒 7 October 2019



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NEWS

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Donald J. Trump 
@realDonaldTrump

Trump & the Russian
intelligence and the new
technologies for soft
warfare

Twitter released 9 million tweets from one Russian troll farm. Here's what we learned.

The massive data dump reveals how trolls disrupt and destabilize local and global politics.

By Aja Romano | @ajaromano | Oct 19, 2018, 12:40pm EDT

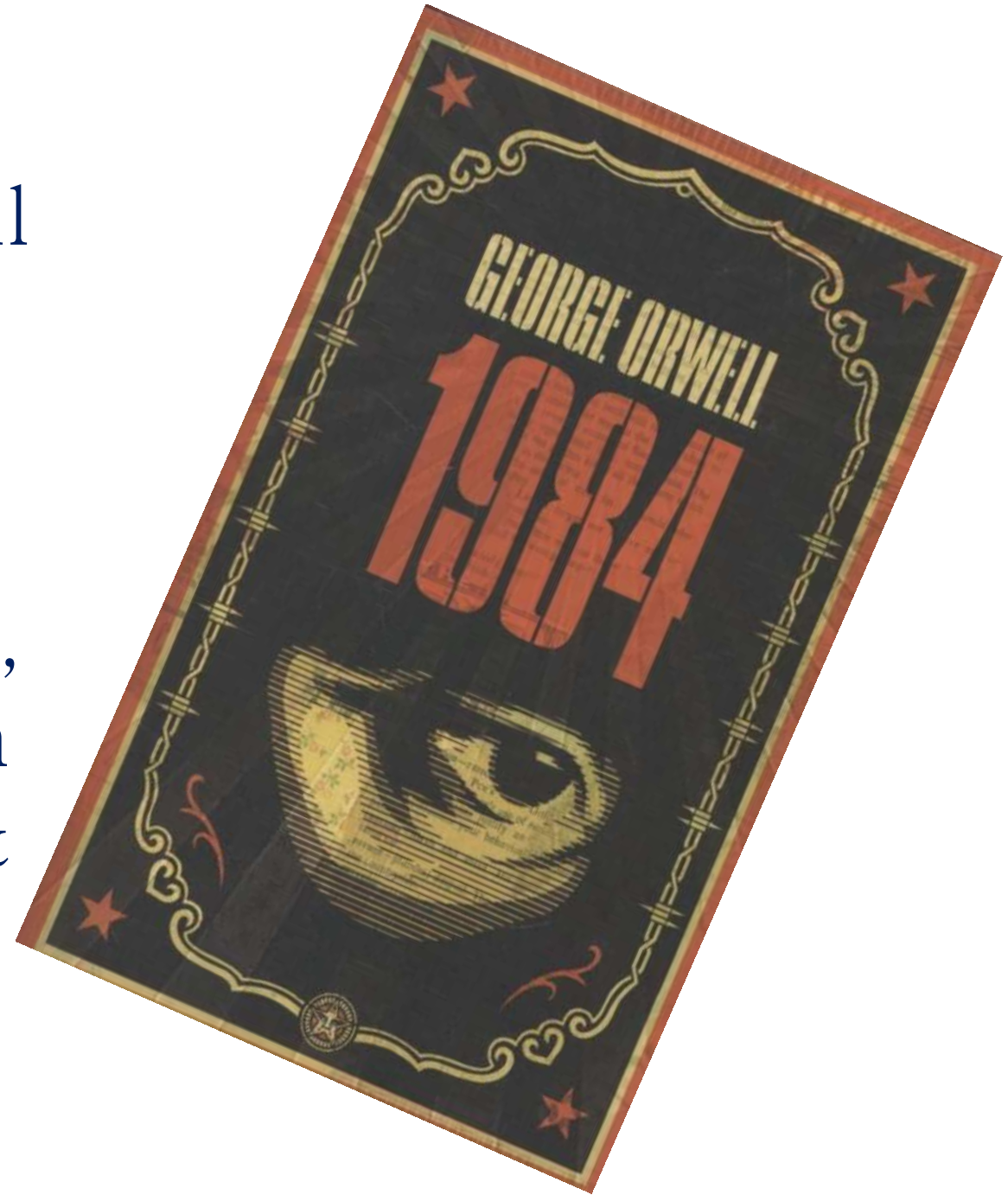
The Vox logo, featuring the word "Vox" in a stylized, black, serif font on a bright yellow rectangular background.

Whose dystopia:
Huxley or Orwell?



George Orwell

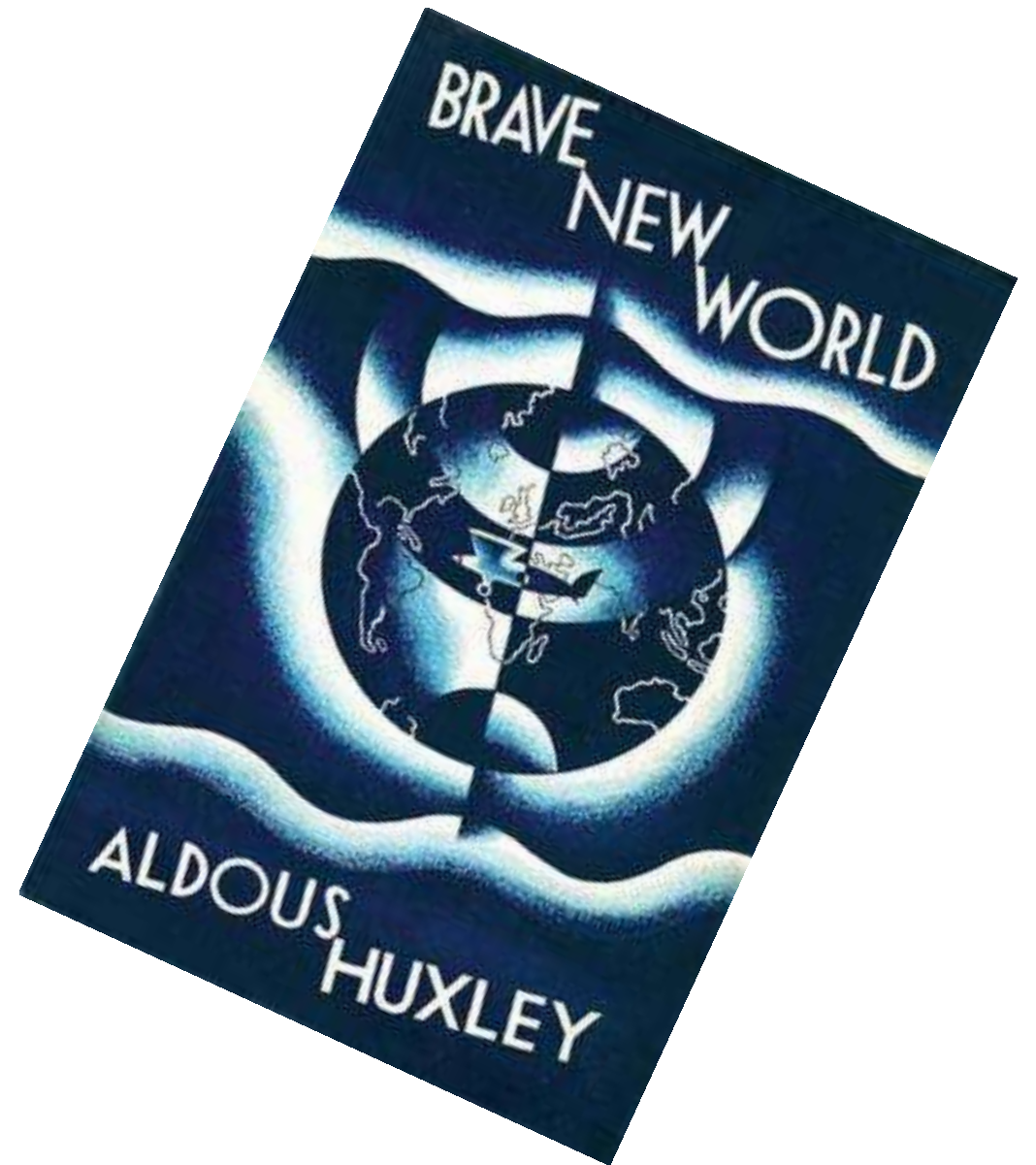
1949; a regimented society,
Big Brother in charge of an
omnipresent surveillance &
propaganda machine





Aldous Huxley

1932; a regimented
world where drug takes
care of consent

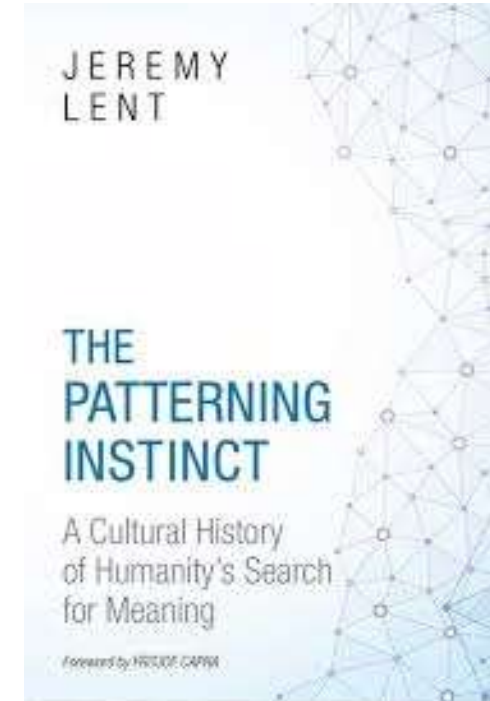
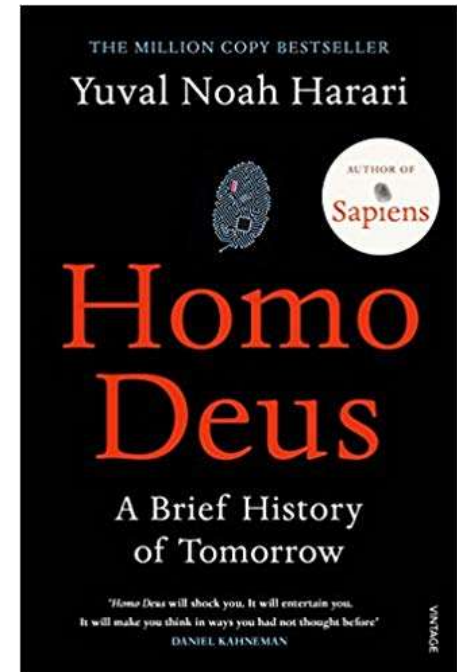


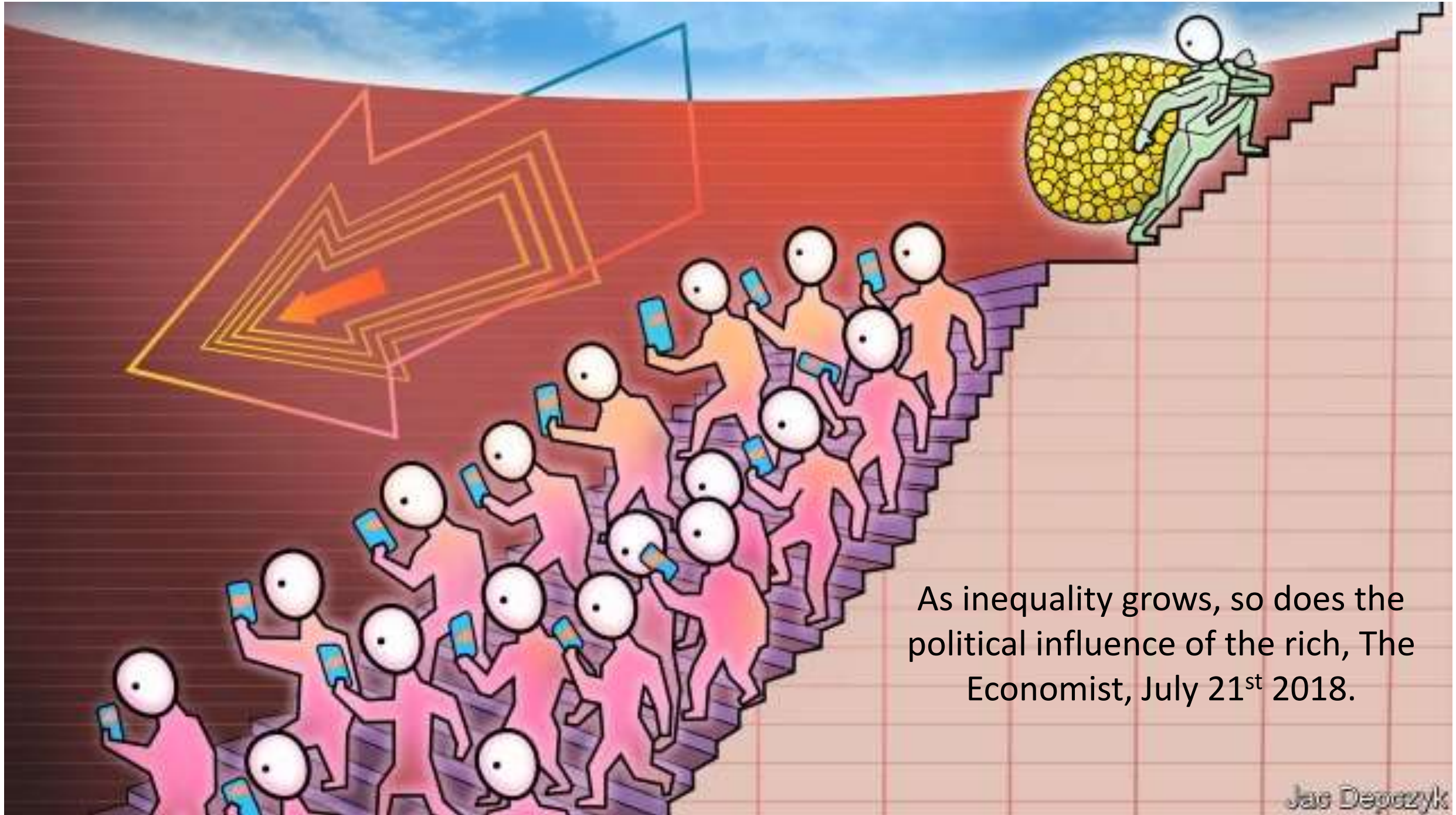
Techno-spit scenario?

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