How to improve the value of your research by making it verifiable

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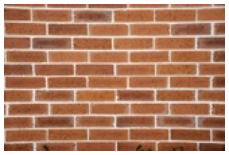
at osf.io/9jhwc

Conducting & evaluating research depends on the ability to:

1. **read**, **understand**, **and** **verify** **it**.



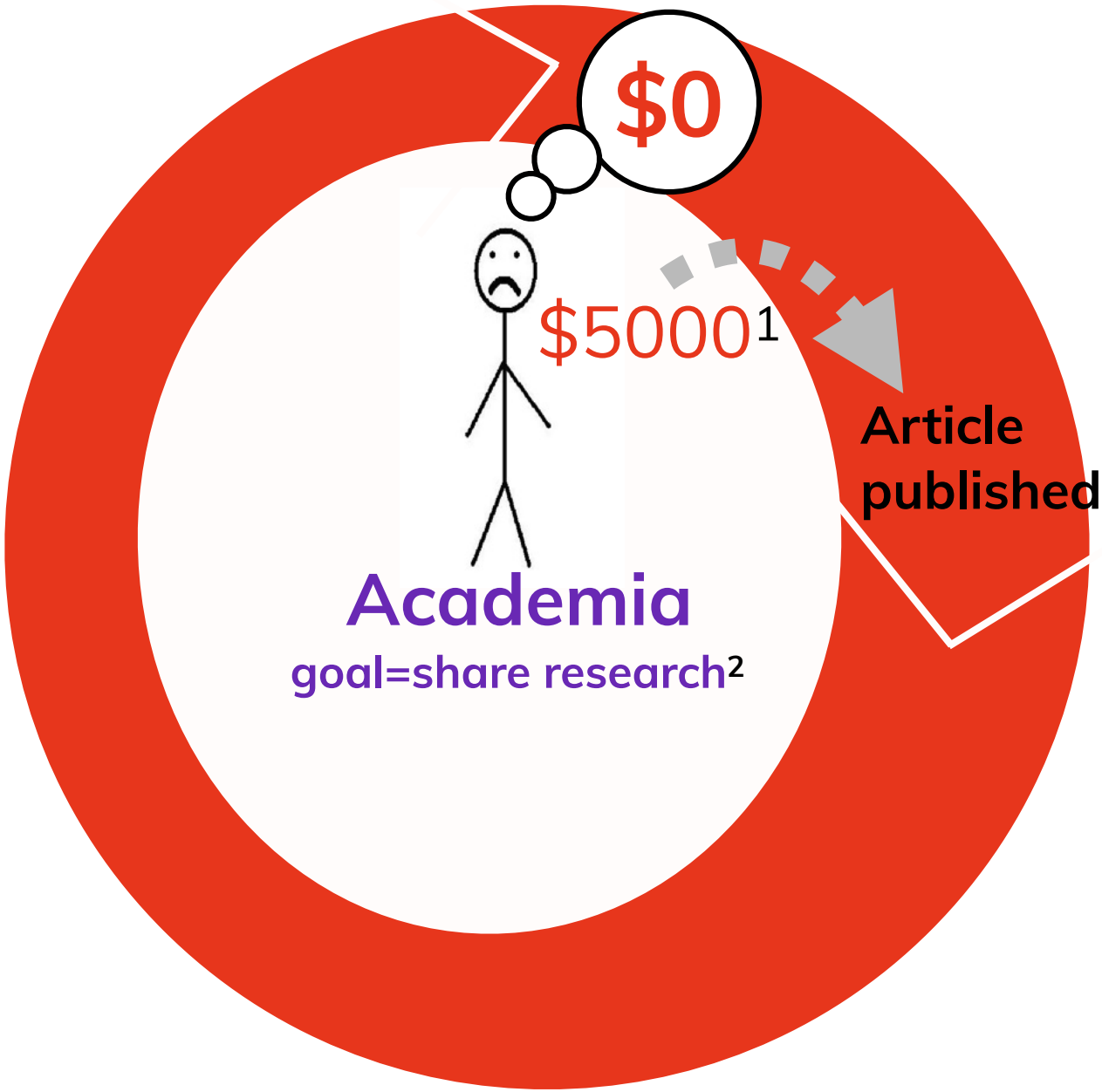
Massive amounts of money paid to publishers = barrier to researchers, academia, and the public

2. have anyone **generate** **and** **disseminate** **it**,

regardless of wealth, access to opportunity, perception of prestige, and evaluator implicit biases

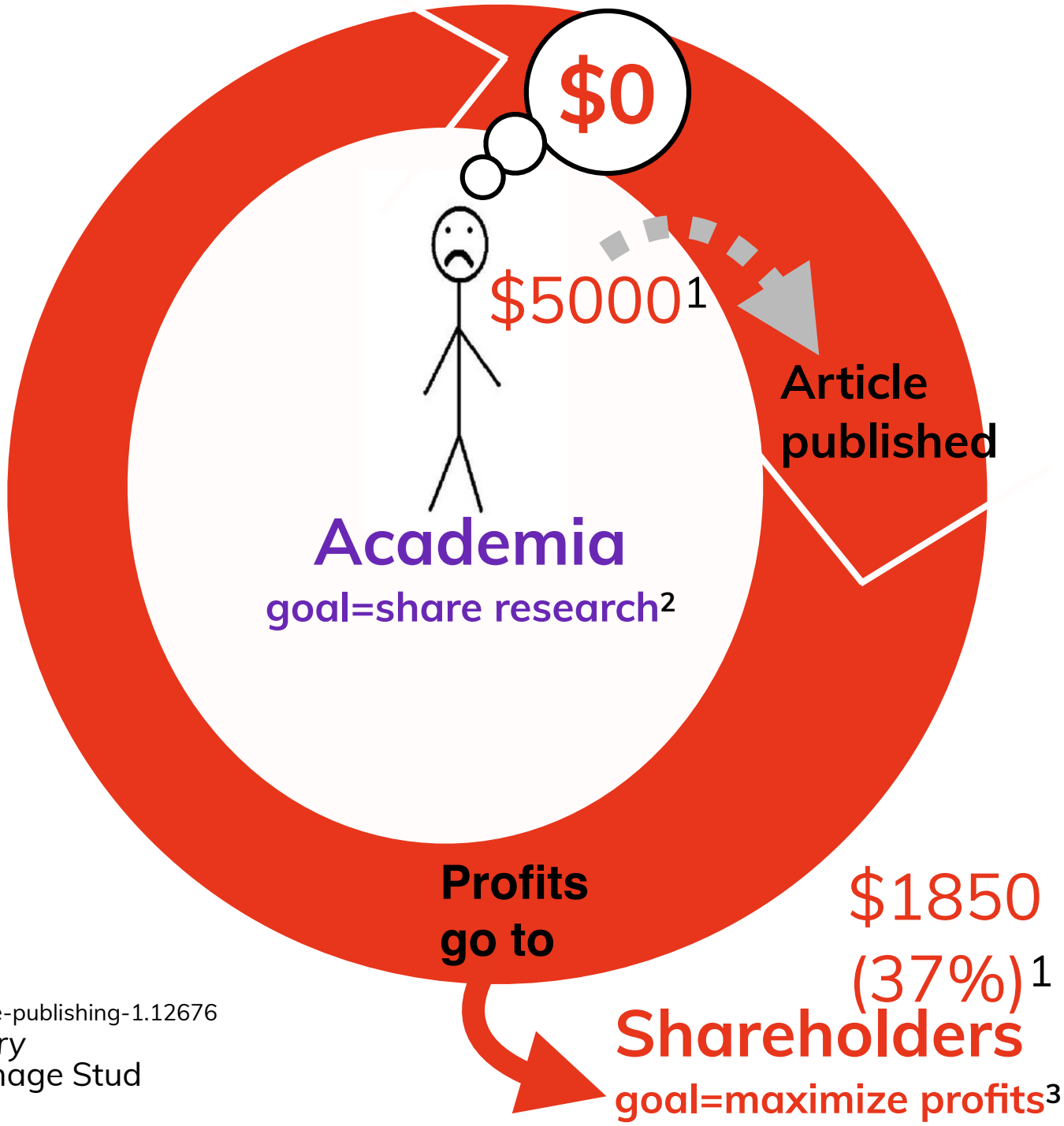
How scholarly publishing works

Exploitative route



[1]Van Noorden 2013 nature.com/news/open-access-the-true-cost-of-science-publishing-1.12676
[2]Nosek & Bar-Anan 2012 *J Psych Inquiry*
Logan 2017 *F1000Research*

Exploitative route



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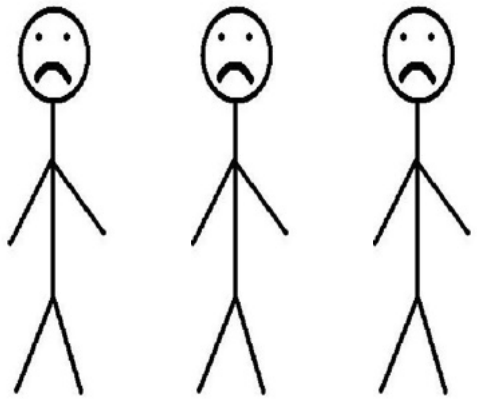
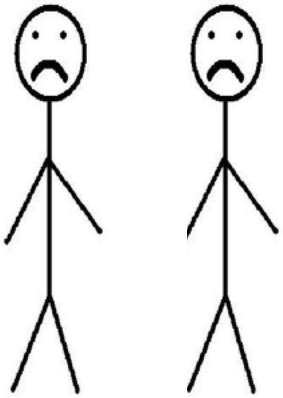
Exploitative route

Indirect discrimination

Patient MD Public



Other researchers



Public funds research

PAYWALL

$0

$5000[1]

Article published

Academia

goal=share research[2]

Available to read by scholarly rich

Profits go to

$1850 (37%)[1]

Shareholders

goal=maximize profits[3]

[1]Van Noorden 2013 nature.com/news/open-access-the-true-cost-of-science-publishing-1.12676, [2]Nosek & Bar-Anan 2012 *J Psych Inquiry*, [3]Husted & de Jesus Salazar 2006 *J Manage Stud*, Murray-Rust 2011 blogs.ch.cam.ac.uk/pmr/2011/10/05/the-scholarly-poor-dentists/, Tennant et al. 2016 *F1000Research*, Logan 2017 *F1000Research*

The ethical framework

1) Researchers and publishers have a **responsibility to the public** to provide them with **free access to publicly funded products**, which are a common good[1,2]

2) Publishers of research products have a **responsibility to researchers** to value the generation and packaging of knowledge[3]

3) Researchers have a **responsibility to the public to conduct rigorous research** because it will serve as the foundation for the advancement of discoveries, it provides the best value for money, and earns public trust[4]

[1]Stilgoe et al. 2013 *Res Policy*
[2]Woodward 1990 *Library Trends*
[3]Fuchs & Sandoval 2013 *TripleC: Communication, Capitalism & Critique*
[4]Nosek & Bar-Anan 2012 *J Psych Inquiry*
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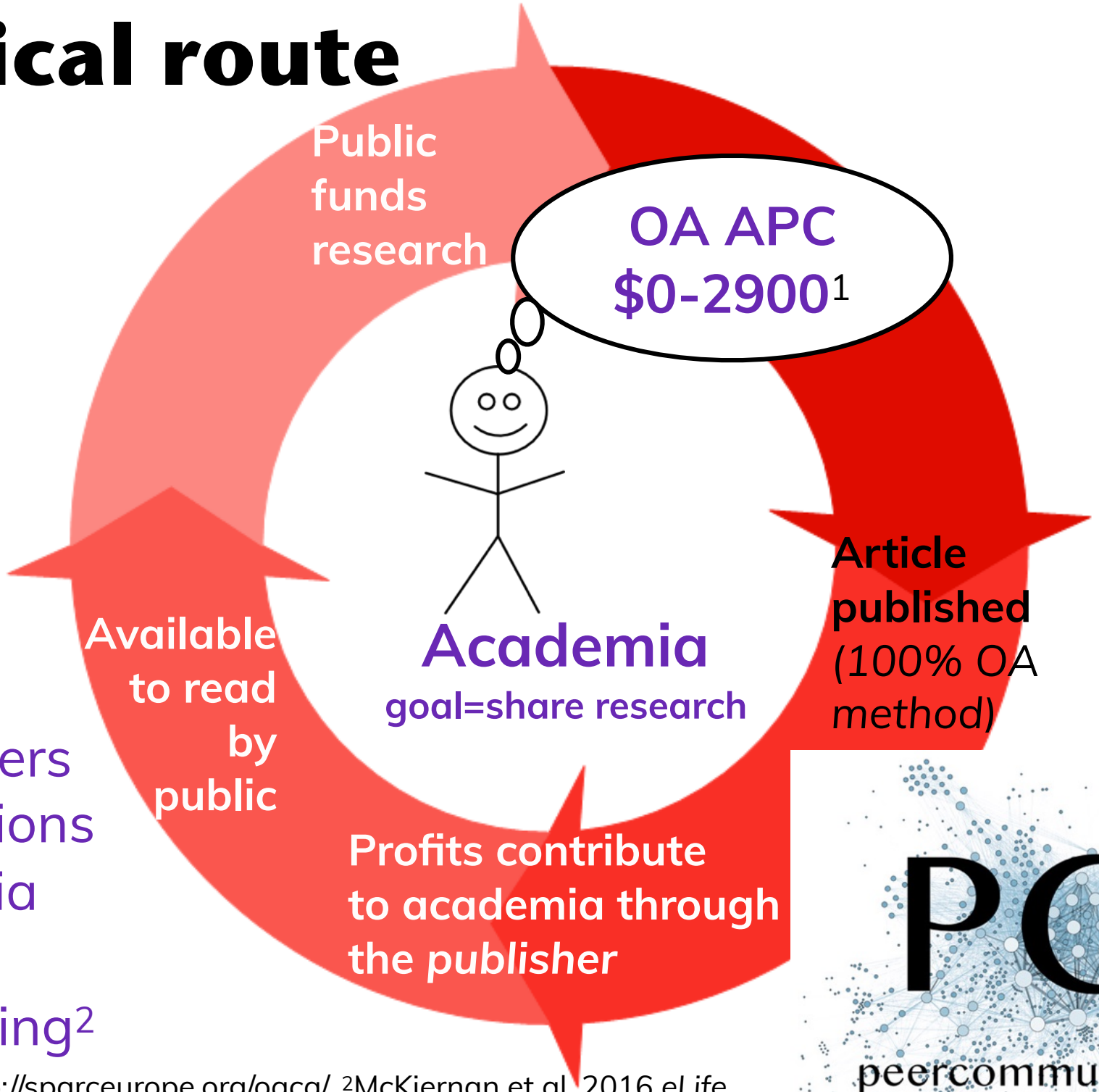
Ethical route



+ readers
+ citations
+ media
+ jobs
+ funding[2]

PCI
peercommunityin.org

[1]SPARC http://sparceurope.org/oaca/, [2]McKiernan et al. 2016 *eLife*, Tennant et al. 2016 *F1000Research*, Logan 2017 *F1000Research*

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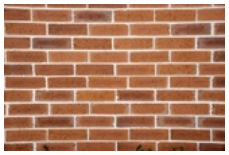

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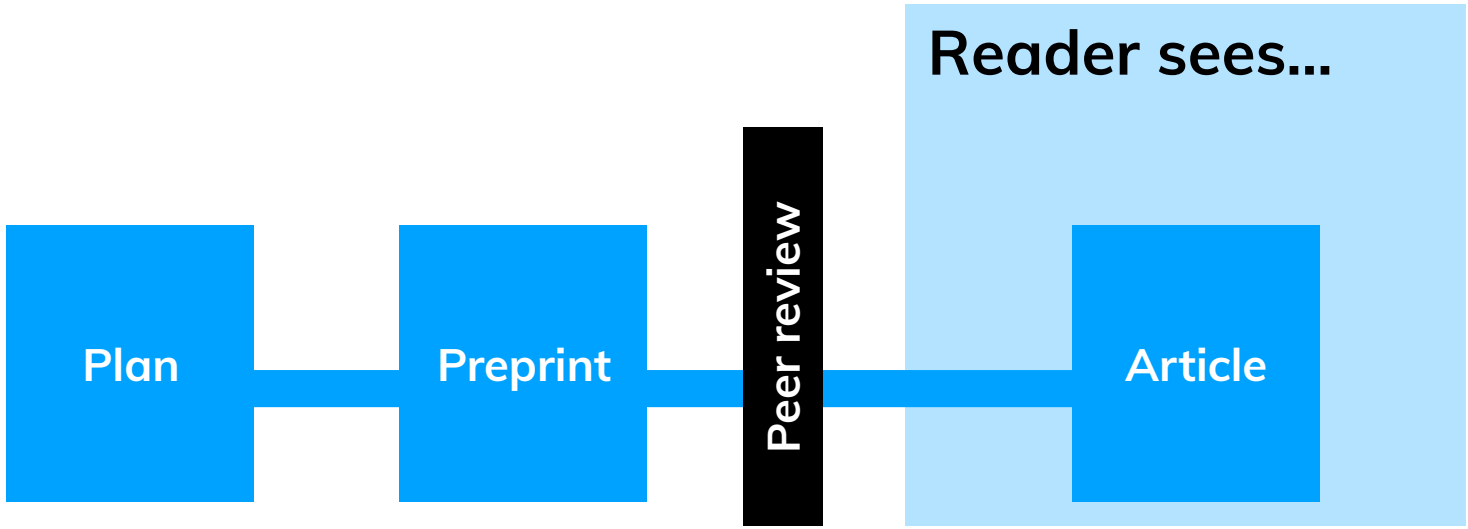
Closed peer review = unverifiable

Closed peer review prevents verifiability of the evaluation of the research process

- Prohibits quality control
- Reviews can be inadequate, biased, subjective
- Editors = key to high standards in research and ethics



Resin & Elmore 2016 *Science & Engineering Ethics*,
https://peerj.com/blog/post/100580518238/whos-afraid-of-open-peer-review/

My closed peer review horror story

- I **reviewed an article**, raised many issues, some insurmountable
- Decision = **Major Revision**
- Not cc'ed on further decisions, **no re-review**
- Asked to publish a response to accepted article. **Accepted version didn't address comments**; many factual errors
- Executive editor + handling editor + president of society **refused to acknowledge they accepted the article without proper revision** and **didn't care it was low quality / incorrect**
- I'm in Acknowledgements

I control where I donate my reviewer/editor time
Benefit to researcher-run efforts = can modify!

Peer review of preregistrations at PCI

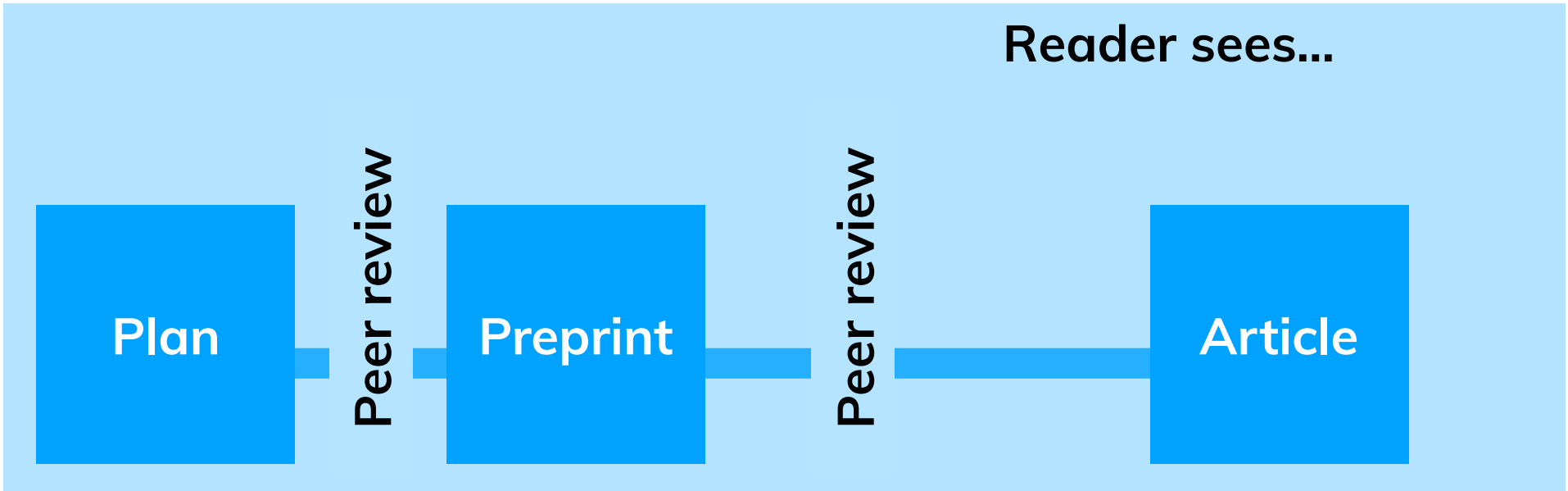
"Flexible registered report"

Prevents wasting resources by improving research before it begins

Peer Community In Ecology
Free and transparent preprint and postprint recommendations in ecology

Peer Community In Evolutionary Biology
Free and transparent preprint and postprint recommendations in evolutionary biology

Allows verification of research process and evaluation process



https://ecology.peercommunityin.org, slides for open peer review talk at JSM: https://osf.io/gwzh6/

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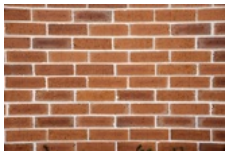

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Making my research readable and verifiable = better & faster

Making my research readable & verifiable saves time and increases its value

Hypotheses

Coordinate team

OSF

Google Photos

Google

WhatsApp

GitLab

slack Mattermost

Collect data electronically

Google Sheets

Prim8 Software

Prereg ➟ Preprint

rmarkdown GitHub bioRxiv THE PREPRINT SERVER FOR BIOLOGY

Peer review #2

Peer Community In Ecology Free and transparent preprint and postprint recommendations in ecology

Articles

Preregister

GitHub

RStudio rmarkdown

GIMP

Citeable

Google Scholar

Institute Repo

3D print & laser cut apparatuses

GitHub FreeCAD Open Source parametric 3D CAD modeler

Code experiments

PsychoPy Psychology software in Python

Back up data

KEEPER

OSF GitHub

The Knowledge Network for Biocomplexity KNB

Peer review #1

Peer Community In Ecology Free and transparent preprint and postprint recommendations in ecology

MPI Innovators blog: what I love about my workflow
https://innovatingscholcomm.mpdl.mpg.de/2019/06/10/corinas-workflow/

See GenR blog for a conversion of this work flow to all open source tools:
https://genr.eu/wp/making-research-workflow-open-source/

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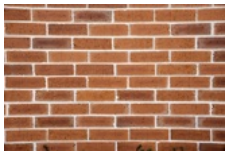

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Selecting researchers based on ability rather than implicit biases

The Privilege Filter: who makes it to the top?

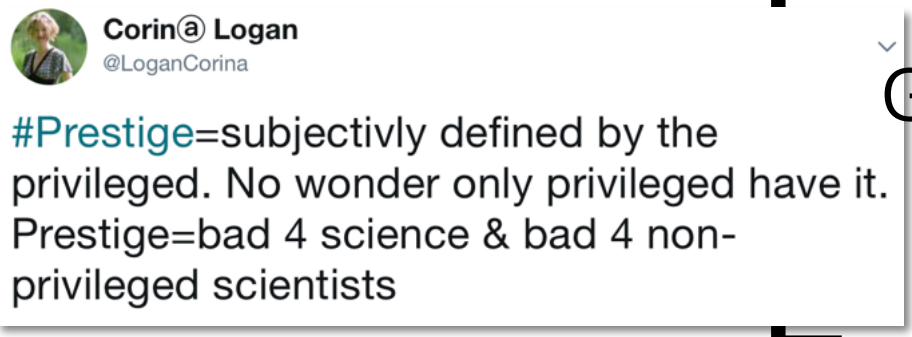
Is science only for the rich?

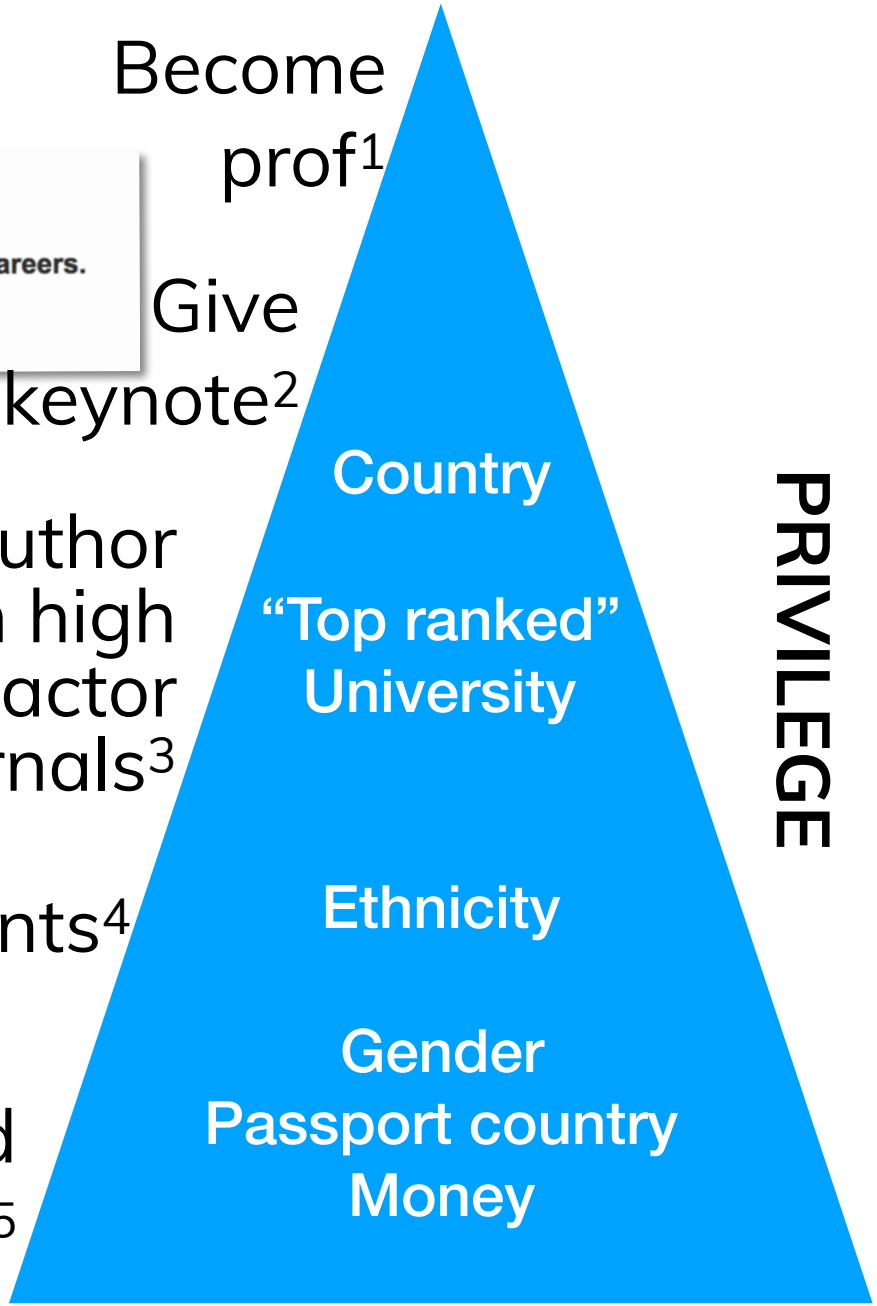
Around the world, poverty and social background remain huge barriers in scientific careers.

21 September 2016

A "strong" CV includes...

- Become prof[1]
- Give keynote[2]
- 1st author articles in high impact factor journals[3]
- Get grants[4]
- Attend conference[5]





More OPPORTUNITY[6] Less

PRIVILEGE

[1]OConnell & Holmes 2015 Wiley, [2]Farr et al 2017 BioSci, [3]Filardo et al. 2016 *BMJ*, [4]*Bornmann et al 2007 J Infometrics*, [5]*O'Grady 2018 arstechnica* https://arstechnica.com/science/2018/11/neuroscience-conference-highlights-travel-bans-effect-on-science/, [6]Merton 1968 Science, twitter.com/LoganCorina/status/868491581145444352, nature.com/news/is-science-only-for-the-rich-1.20650?WT.mc_id=FBK_NatureNews&sf81929464=1

The Privilege Filter: who makes it to the top?

Women's research rated **lower quality** than men's[7]

Thus risk taking (publishing, submitting conference abstract)

= more costly (lower payoff)

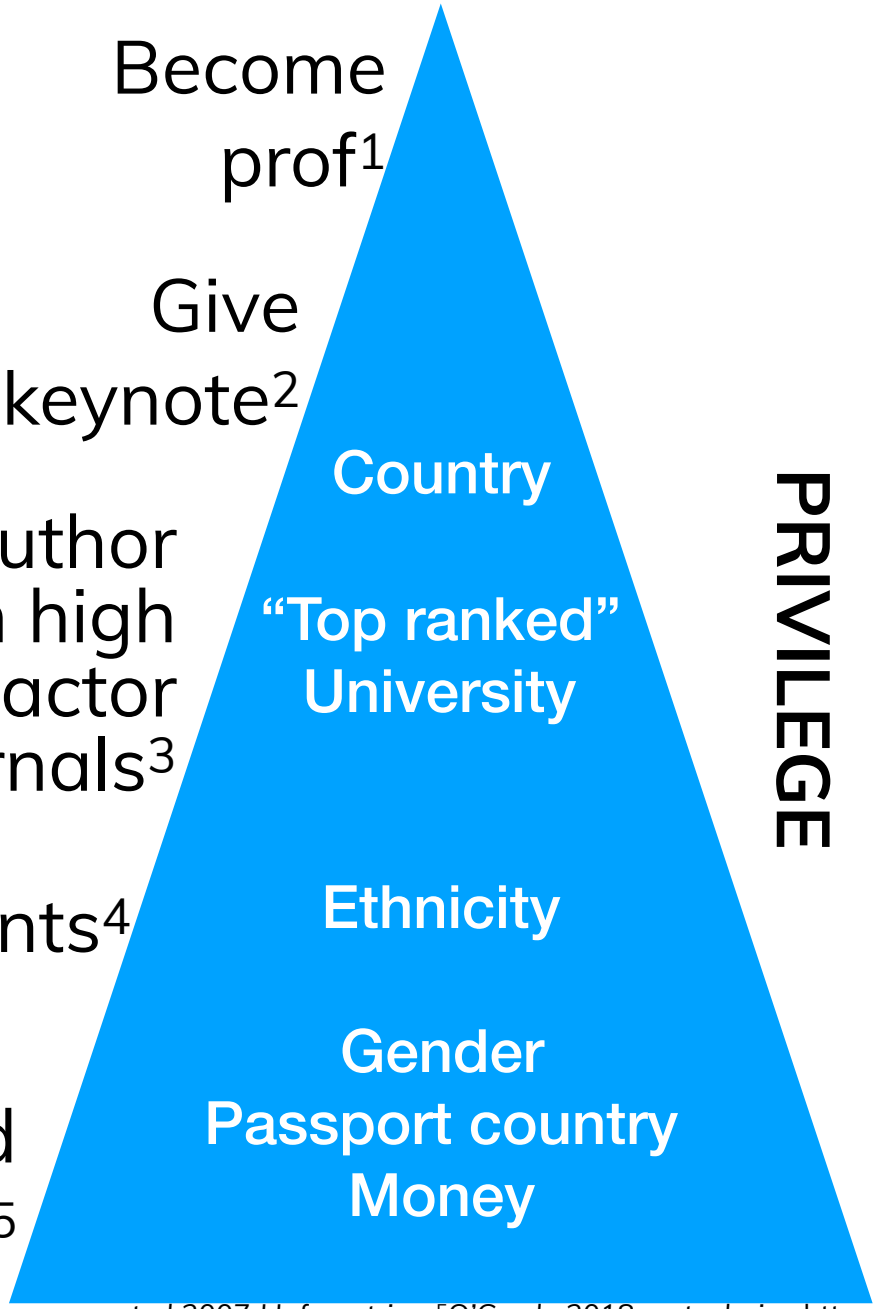
Become prof[1]

Give keynote[2]

1st author articles in high impact factor journals[3]

Get grants[4]

Attend conference[5]



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Prestige blocks knowledge generation: Tackling implicit biases

- Consider background of person behind the CV: do they have enough privilege to **access** opportunities considered "good"?
- Consider the **evidence** before judging a top woman harshly[1]
- **Discover** your implicit biases
  https://implicit.harvard.edu
- Gender language **calculator**, use "they", avoid names
  http://gender-decoder.katmatfield.com/about
- Call on a **woman to ask the 1st question**[2]
  http://diversityinacademia.strikingly.com
- When offering an opportunity (e.g., job, seminar, etc.), **recruit** via groups that support Underrepresented Minorities in the sciences (URMs).
  ALWAYS well qualified URMs - stop and think

Increase diversity via...

- Sign & implement DORA sfdora.org
- Open Science Massive Online Open Course https://opensciencemooc.eu

- **Checklist to improve equity in faculty hiring**
- **Databases of URMs**

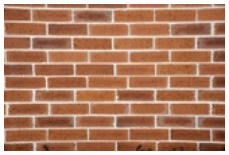
Balla (2019 *Mol Biol Cell*)

Request a woman scientist
500womenscientists.org

[1]Sandberg 2013 Lean In, [2]Carter et al. 2018 PLOS ONE

I have argued research value increases when...

1. one can **read**, **understand**, **and verify** **it**.



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We can **stop exploiting and discriminating now** because...

- ethical open options exist
- we can address our implicit biases

We won't be...


Corina Logan & Laurent Gatto

Ross Mounce, Stephen Eglen, Adrian Currie, Lauren Maggio

BULLIED INTO BAD SCIENCE

Leading individuals and institutions in adopting open practices to improve research rigor

Early Career Rearchers (ECRs) **often feel pressured** into taking actions **against our ethics** to pursue an academic career (e.g., publishing in particular journals)

Slides CC-BY-SA 4.0 at osf.io/9jhwc

ECRs: Sign the **petition** to help us change academic culture

Non-ECRs: Join the list of **supporters** by valuing open practices, especially when making decisions about hiring, promotion, and grants

BulliedIntoBadScience.org #BulliedIntoBadScience @LoganCorina

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