Hong Kong Principles
for assessing researchers with a view to foster research integrity

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Keynote lecture during the 6th ERION Meeting organized by EARMA on 20 October 2020 – 50 minutes in total (30 for presentation and 20 for Q&A – preferably intertwined)
core message

We should reward responsible research practices and avoid perverse incentives when assessing researchers and not merely rely on bibliometric indicators.

Bibliometric indicators are publication and citation counts and their derivatives like Impact Factor and Hirsch Index.
During recent years the simplistic and isolated use of quantitative bibliometric indicators (e.g. Impact Factor and H-index) to evaluate research and researchers has been strongly criticized.

The Hong Kong Principles aim at restoring the balance in the assessment for researchers by relying much less on bibliometric indicators and by taking into account open science modalities that strengthen research integrity.

https://re.ukri.org/sector-guidance/publications/metric-tide/

http://www.leidenmanifesto.org/

https://sfdora.org/read/
- Grants applications
- Vacancies
- Promotion
- Tenure
- Awards
What is good for the *truth* of and the *trust* in research is not always good for your academic career.

Many rewards in academia are linked to having positive and spectacular results as these are published more easily in high impact journals and will be cited more often.

The various Questionable Research Practices have in common that they can effectively help to get these positive and spectacular results.
Cutting corners or worse can compromise the validity of research but is sometimes better for your career. The survival value of cheating in science is probably substantial. This underlines the idea that the current assessment methods involve perverse incentives.

Smaldino et al - The natural selection of bad science - Royal Society Open Science 2016; 3 160384
Functioning of moral compass depends on:

- Virtuousness of the individual
- Research climate in the lab
- Adequate incentives

Researchers navigate the dilemmas in their work with their moral compass.

But there are also strong other drivers of their behaviour in the direct professional environment and the system of science at large.

That doesn’t diminish the personal responsibility to behave well in research. In fact it makes personal responsibility larger: individual researchers also have to help to improve the research climate and to remove perverse incentives.
This slide shows – in a simplified way – how things can go wrong.

In most disciplines the proportion of papers reporting positive results increases over time. Positive results are published and cited more often, and also get more media attention. This will probably increase the likelihood of getting grants and tenure. We have also some evidence that conflicts of interest of researchers and sponsor interests may lead to sloppy science or worse. Questionable Research Practices (QRP) and Research Misconduct (RM) can effectively help to get (false) positive results.

Negative findings are so unpopular that often these are not reported at all. This mechanism will lead to publication bias, outcome reporting bias and citation bias. Especially small studies with positive outcomes will often report chance findings. These phenomena will distort the published record and can explain the replication crisis.

Personal interests and sponsor interests can lead to QRP also if researchers are not aware of it. Many of us want to please our sponsor with a view to motivate them to keep funding our work. That could lead for instance to subtle flaws in the study design, to selective reporting and to spin in the report of the results of the study.

There is evidence for some of the relations suggested in this slide, but no or only little evidence for most of them. We really need more solid empirical research to clarify how
these things work. Gaining this knowledge is important for effectively fostering research integrity and preventing QRP and RM.
Research institutes have a duty to empower researchers to engage in responsible research practices and to discourage questionable research practices and research misconduct.

Bouter LM. What research institutions can do to foster research integrity. Journal of Science and Engineering Ethics 2020; 26: 2363-69.
Research integrity: nine ways to move from talk to walk

Achieve Research Integrity with our Toolbox

Our mission is to promote excellent research and a strong research integrity culture aligned with the European Code of Conduct

https://sops4ri.eu/
RPO stands for research performing organization.
We’re working on a similar toolbox for RFOs (research funding organizations).

https://sops4ri.eu/tools/
The SOPs4RI toolbox covers 3 areas and 9 topics. I have no time to present them all. But I’ll focus on one example for improving the research environment: *ensure fair assessment procedures*, because these procedures cover many of the other 8 topics.

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000737
Hong Kong Principles

1. Assess responsible research practices
2. Value complete reporting
3. Reward the practice of Open Science
4. Acknowledge a broad range of research activities
5. Recognize essential other tasks like peer review and mentoring

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000737
Transparency is essential

Always prospectively
- Study Protocol → Open Methods
- Analysis Plan → Open Methods
- Amendments → Open Methods
- Data Sets → Open Data

Publicly – if possible

In theory the solution is easy and takes the form of ensuring that all research findings are published and the whole process is transparent, meaning that all steps can be checked and reconstructed. Studies need to be preregistered and a full protocol must be uploaded in a repository before the start of data collection. Similarly a data-analysis plan, syntaxes, data sets and full results need to be uploaded. Amendments and changes are possible but should always leave traces, thus enabling users to identify actions that were potentially data-driven. While ideally these elements of transparency are publicly accessible, there are many situations where delayed, conditional or incomplete access is indicated. But that does not detract from the principle of full transparency: even the process and outcomes of highly classified research for the defence industry should if necessary be made available for a thorough check by an investigation committee that is bound by confidentiality.

Bouter LM. Open data is not enough to realize full transparency. J Clin Epidemiol 2016; 70: 256-7.
Bouter LM. Fostering responsible research practices is a shared responsibility of multiple stakeholders. Journal of Clinical Epidemiology 2018; 96: 143-6.

NAS - Open Science by design - realizing a vision for 21th century research - Washington,
2018 (https://www.nap.edu/download/25116)

https://www.fosteropenscience.eu/
https://cos.io/
Open science helps in fostering research integrity by making research more transparent, reproducible and controllable.

FAIR = Findable, Accessible, Interoperable and Reusable


Rice and Moher - Curtailing the use of preregistration - a misused term - Perspectives on Psychological Science 2019; 14 1105-8.


NAS - Open Science by design - realizing a vision for 21st century research - Washington, 2018 (https://www.nap.edu/download/25116)

https://www.fosteropenscience.eu/
https://doi.org/10.1371/journal.pbio.3000246
https://cos.io/rr/
How negative results disappear from the published literature


This rather shocking example concerns the fate of an inception cohort of 105 RCTs of the efficacy of anti-depression drugs from the FDA database. The cohort is complete in the sense that pharmaceutical companies must register all trials they intend to use to obtain FDA approval before embarking on data collection. The FDA considered 50% of the trials to be positive after carefully looking at the results.
The KNAW report appeared in January 2018

The NAS report appeared in June 2019
PDF available at: https://www.nap.edu/catalog/25303/reproducibility-and-replicability-in-science
Important causes of ‘replicability crisis’

- Selective reporting
- Low power
- P-hacking
- HARKing

Hypothesizing After Results are Known

Wicherts et al - Degrees of freedom - checklist to avoid p-hacking - Front Psych 2016; 7: 1832
Original discoveries are often wrong and cannot be trusted before they have been successfully replicated

Ioannidis. Why replication has more scientific value than original discovery. Behavioral and Brain Sciences 2018; 41: e137
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https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000737
The Wellcome Trust recently published very informative survey results on how researchers perceive their culture: (https://wellcome.ac.uk/sites/default/files/what-researchers-think-about-the-culture-they-work-in.pdf).

The Academic Research Climate in Amsterdam (ARCA) study explored these perceptions empirically.


See also: http://www.amsterdamresearchclimate.nl/
Research Integrity Climate

- **junior researchers** perceive this **more negatively** than seniors
- **junior researchers** say that their **supervisors are too little committed** to fostering research integrity
- **PhD students** perceive **more competition and suspicion** among colleagues than associate and full professors
- **natural sciences** researchers have a **more positive perception** of the research integrity climate
- **social sciences** and **humanities** researchers perceive **less fairness** in **publishing and acquiring funding**

Haven TL, Tijdink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210599

See also: http://www.amsterdamresearchclimate.nl/
Superb supervision junior - mentoring your PhD candidate towards responsible conduct of research

Preprints and Post-publication Peer Review

https://arxiv.org/
https://chemrxiv.org/
https://www.biorxiv.org/
https://psyarxiv.com/
http://asapbio.org/
https://pubpeer.com/

List of 52 preprint servers at
https://docs.google.com/spreadsheets/d/17RgfQcGJHKsSJJwZn0oiXAnimZu2sZsWp8Z6ZaYvo/edit#gid=0

YouTube video ‘What are preprints?’
(https://www.youtube.com/watch?time_continue=9&v=2zMgY8Dx9co)


Chalmers I, Glaziou P. Should there be greater use of preprint servers for publishing reports of biomedical science? F1000Research 2016; 5: 272

Abstract

Reporting of research findings is often selective. This threatens the validity of the published body of knowledge if the decision to report depends on the nature of the results. The evidence derives from studies on causes and mechanisms underlying selective reporting may help to avoid or reduce reporting bias. Such research should be guided by a theoretical framework of possible causal pathways that lead to reporting bias. We build upon a classification of determinants of selective reporting that we recently developed in a systematic review of the topic. The resulting theoretical framework features four clusters of causes. There are two clusters of necessary causes: (a) motivations (e.g., a preference for particular findings) and (b) means (e.g., a flexible study design). These two combined represent a sufficient cause for reporting bias to occur. The framework also features two clusters of component causes: (C) conflicts and balancing of interests referring to the individual or the team, and (D) pressures from science and society. The component causes may modify the effect of the necessary causes or may lead to recording bias mediated through the necessary causes. Our theoretical framework is meant to inspire further research and to create awareness among researchers and end-users of research about reporting bias and its causes.

Keywords
Causation, publication bias, questionable research practice, reporting bias, research design, selective reporting

The Hong Kong Principles for assessing researchers: Fostering research integrity

PLOS Biology 18(7): e3000737.

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000737
Please endorse the HKPs @

www.wcrif.org/guidance/hong-kong-principles
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