

OPEN SCIENCE AND RESEARCH INTEGRITY

Jan De Houwer & Pieter Van Dessel

Thanks to Gert Storms and Chris Chambers (<https://osf.io/d4fh5/>)

OPEN SCIENCE

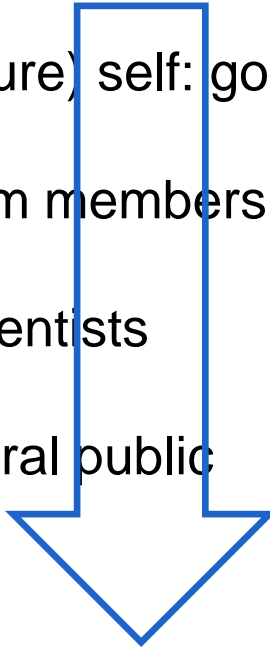


WIKIPEDIA
The Free Encyclopedia

Open science is the movement to make scientific research, data and dissemination accessible to all levels of an inquiring society, amateur or professional. It encompasses practices such as publishing open research, campaigning for open access, encouraging scientists to practice open notebook science, and generally making it easier to publish and communicate scientific knowledge.

LEVELS OF OPEN SCIENCE

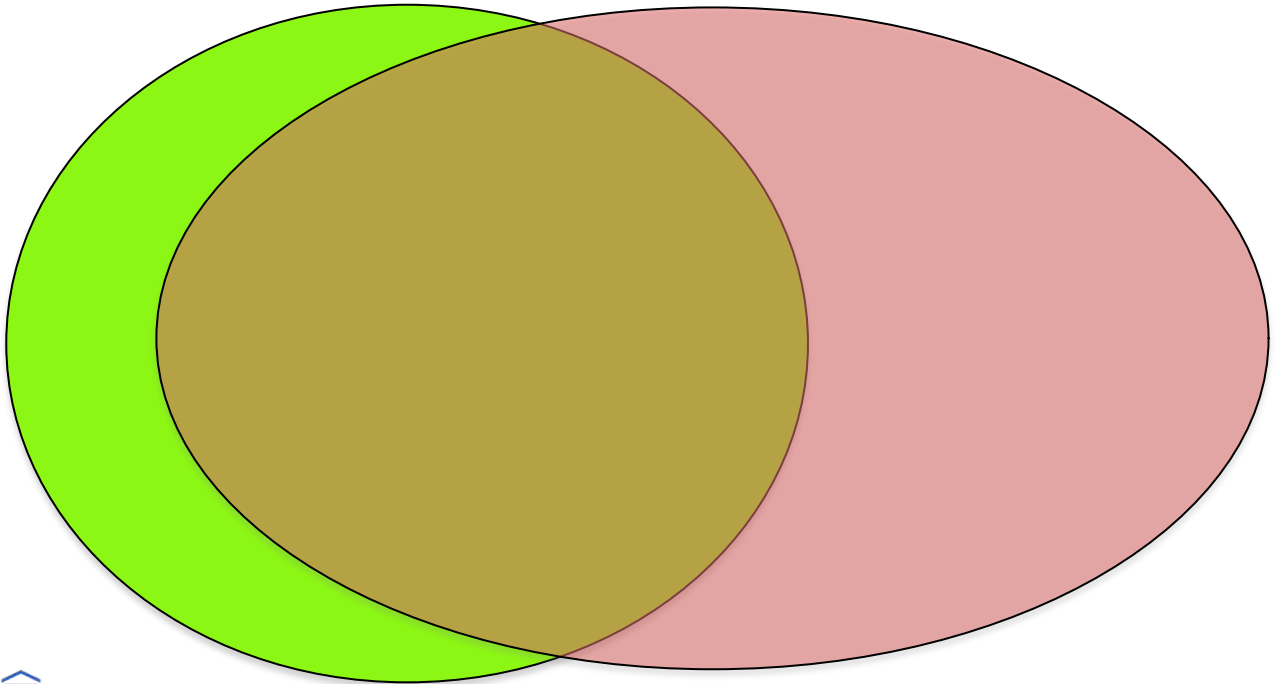
1. Open to your (future) self: good data management
2. Open to your team members: e.g., data buddies
3. Open to other scientists
4. Open to the general public



=> Increasing risks of misuse of data: requires reciprocity: using access to open data requires giving access to data

Open science

Research Integrity



RESEARCH INTEGRITY

ALLEA
ALL European
Academies



The European Code of Conduct for Research Integrity

REVISED EDITION

- Research institutions and organisations reward open and reproducible practices in hiring and promotion of researchers.
- Authors ensure that their work is made available to colleagues in a timely, open, transparent, and accurate manner, unless otherwise agreed, and are honest in their communication to the general public and in traditional and social media.
- Researchers publish results and interpretations of research in an open, honest, transparent and accurate manner, and respect confidentiality of data or findings when legitimately required to do so.
- Researchers, research institutions and organisations ensure access to data is as open as possible, as closed as necessary, and where appropriate in line with the FAIR Principles (Findable, Accessible, Interoperable and Re-usable) for data management.
- All partners in research collaborations agree at the outset on the goals of the research and on the process for communicating their research as transparently and openly as possible.

SHORT PSYCHOLOGICAL DEFINITION OF RI

Behavior that is directed at scientific goals (rather than other goals such as personal prestige, money, ...) in a competent manner

Like any behavior, research integrity depends on perceived benefits and costs

(lesson from learning psychology, now exploited by behavioral economics)

Change behavior by changing perception of and actual benefits and costs

Promoting open science by increasing perceived benefits and decreasing perceived costs:

- strengthens RI directly: open science is part of RI
- strengthens RI indirectly: Transparency as a motivator to get things right (to give primacy to scientific goals)
- does not prevent fraude

CHANGING THE PERCEIVED BENEFITS AND COSTS OF OPEN SCIENCE

I. Perception

1. Ownership: MY data and ideas
=> Funder or university is owner
=> They and those who pay them
(society) should have access



Training and guidelines are necessary, but not sufficient to change behavior: The actual reward structure is what matters most

REWARD STRUCTURE

**What's best for
science**

High quality
research,
regardless of
outcome

**What's best for
scientists**

Producing a lot
of
publishable
results

A manifesto for reproducible science

Marcus R. Munafò^{1,2*}, Brian A. Nosek^{3,4}, Dorothy V. M. Bishop⁵, Katherine S. Button⁶,
Christopher D. Chambers⁷, Nathalie Percie du Sert⁸, Uri Simonsohn⁹, Eric-Jan Wagenmakers¹⁰,
Jennifer J. Ware¹¹ and John P. A. Ioannidis^{12,13,14}

Improving the reliability and efficiency of scientific research will increase the credibility of the published scientific literature and accelerate discovery. Here we argue for the adoption of measures to optimize key elements of the scientific process: methods, reporting and dissemination, reproducibility, evaluation and incentives. There is some evidence from both simulations and empirical studies supporting the likely effectiveness of these measures, but their broad adoption by researchers, institutions, funders and journals will require iterative evaluation and improvement. We discuss the goals of these measures, and how they can be implemented, in the hope that this will facilitate action toward improving the transparency, reproducibility and efficiency of scientific research.

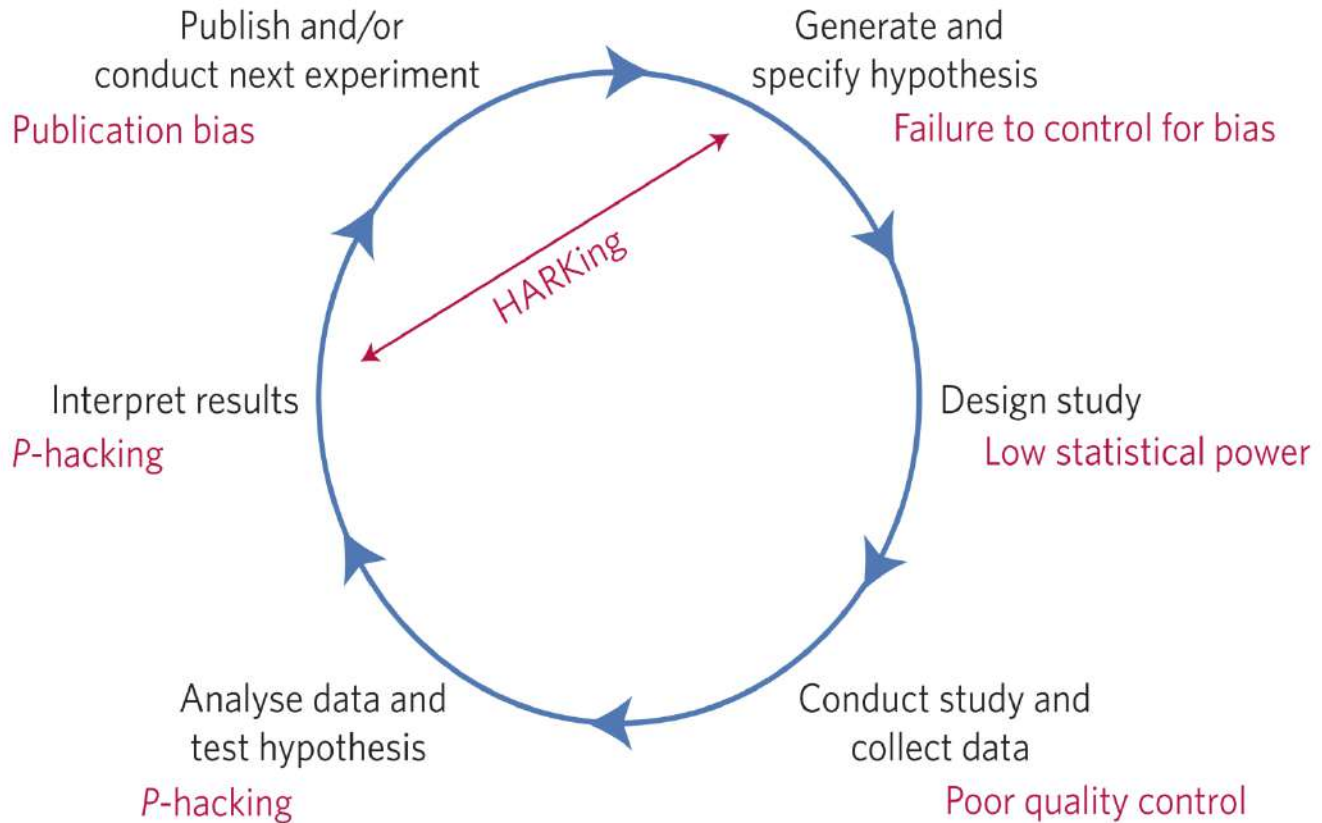


Figure 1 | Threats to reproducible science. An idealized version of the

II. Actual costs and benefits of open science

1. Open science infrastructure to reduce cost:

Open Science Framework (see Pieter), data repositories, R markdown, DMPonline, ...

=> In Belgium, surprisingly little support is given by universities and funding agencies (i.e. the owners)

2. Increase the benefits of open science

=> A lot is happening at the level of journals

- Badges for good practices
- Registered reports
- Journals and reviewers requiring open data

OSF Badges for Open Practices

<https://osf.io/tvyxz/>



Open Data badge is earned for making publicly available the digitally-shareable data necessary to reproduce the reported results



Open Materials badge is earned by making publicly available the components of the research methodology needed to reproduce the reported procedure and analysis.



Preregistered badges are earned for preregistering research

Research Article

People With Autism Spectrum Conditions Make More Consistent Decisions



George D. Farmer, Simon Baron-Cohen, and William J. Skylark
Department of Psychology, University of Cambridge

ASSOCIATION FOR
PSYCHOLOGICAL SCIENCE

Psychological Science
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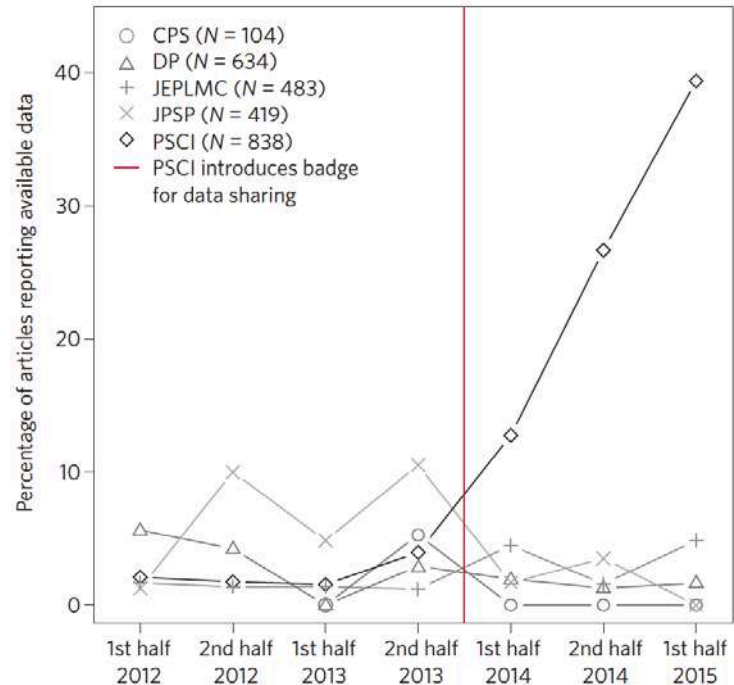


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DOI: 10.1177/0956797617694867
www.psychologicalscience.org/PS

SAGE

OSF Badges for Open Practices

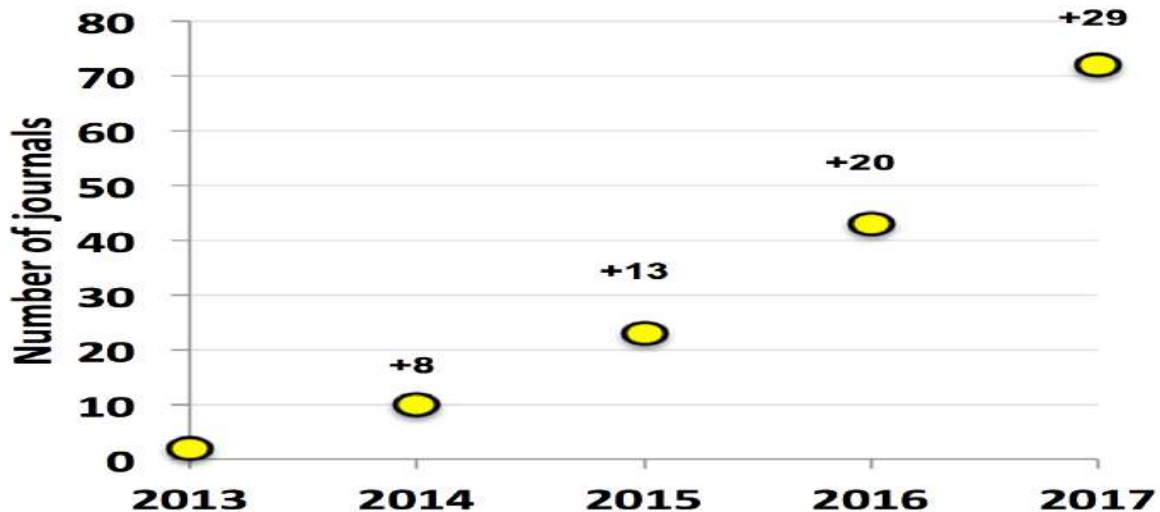
<https://osf.io/tvyxz/>



Data sharing at Psychological Science increased from ~5% to ~40% after introducing badges

Registered Reports

- Peer review **before** results are known
- In principle acceptance regardless of outcomes
- Eliminates publication bias, p -hacking, HARKing; also promotes open data & materials
- 72 adopting journals so far



Peer Reviewers' Openness Initiative (PRO)

<https://opennessinitiative.org/>



The screenshot shows the homepage of the Peer Reviewers' Openness Initiative (PRO). The header includes the site title and navigation links: THE INITIATIVE, SIGNATORIES, JOIN THE INITIATIVE, FOR REVIEWERS, FOR AUTHORS, FAQ, REFERENCES, WHO ARE WE?, and a search icon. The main content area features a large green padlock logo with the text "THE PRO INITIATIVE for open science". Below the logo is a paragraph explaining the initiative's goals: "We believe that openness and transparency are core values of science. For a long time, technological obstacles existed preventing transparency from being the norm. With the advent of the internet, however, these obstacles have largely disappeared. The promise of open research can finally be realized, but this will require a cultural change in science. The power to create that change lies in the peer-review process." A second paragraph states: "We suggest that beginning January 1, 2017, reviewers make open practices a pre-condition for more comprehensive review. This is already in reviewers' power; to drive the change, all that is needed is for reviewers to collectively agree that the time for change has come." The left sidebar contains a search bar, "RECENT POSTS" (listing "PRO Initiative media"), "RECENT COMMENTS" (listing comments by Richard Morey, Matt Superdock, Tomasz Witkowski, and Graeme Armstrong), and "ARCHIVES" (listing "November 2015").

- Reviewers agree to review papers only where data and digital study materials are publicly archived **OR** where authors state in the paper why they are not

NATURE | NEWS



Peer-review activists push psychology journals towards open data

Editor asked to resign from journal for saying he'll review only papers whose data he can see.

[Gautam Naik](#)

01 March 2017



PDF

[Rights & Permissions](#)

Psychologist Gert Storms says he won't review papers if authors don't share underlying data, or explain

Transparency and Openness Promotion (TOP) Guidelines

<http://cos.io/top/>

Summary of the eight standards and three levels of the TOP

Levels 1 to 3 are increasingly stringent for each standard. Level 0 offers a

Cortex

A journal devoted to the study of the nervous system and behavior.

the standard.

	LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
Citation standards	Journal encourages citation of data, code, and materials—or says nothing.	Journal describes citation of data in guidelines to authors with clear rules and examples.	Article provides appropriate citation for data and material used, consistent with journal author guidelines.	Article is not published until appropriate citation for data and materials is provided that follows journal's author guidelines.
Data transparency	Journal encourages data sharing—or says nothing.	Article states whether data are available and, if so, where to access them.	Data must be posted to a trusted repository. Exception must be identified at article submission.	Data must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Analytic methods (code) transparency	Journal encourages code sharing—or says nothing.	Article states whether code is available and, if so, where to access them.	Code must be posted to a trusted repository. Exception must be identified at article submission.	Code must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Research materials transparency	Journal encourages materials sharing—or says nothing.	Article states whether materials are available and, if so, where to access them.	Materials must be posted to a trusted repository. Exception must be identified at article submission.	Materials must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Design and analysis transparency	Journal encourages design and analysis transparency or says nothing.	Journal articulates design transparency standards.	Journal requires adherence to design transparency standards for review and publication.	Journal requires and enforces adherence to design transparency standards for review and publication.
Preregistration of studies	Journal says nothing.	Journal encourages preregistration of studies and provides link in article to preregistration if it exists.	Journal encourages preregistration of studies and provide link in article and certification of meeting preregistration badge requirements.	Journal requires preregistration of studies and provides link and badge in article to meeting requirements.
Preregistration of analysis plans	Journal says nothing.	Journal encourages preanalysis plans and provides link in article to registered analysis plan if it exists.	Journal encourages preanalysis plans and provides link in article and certification of meeting registered analysis plan badge requirements.	Journal requires preregistration of studies with analysis plans and provides link and badge in article to meeting requirements.
Replication	Journal discourages submission of replication studies—or says nothing.	Journal encourages submission of replication studies.	Journal encourages submission of replication studies and conducts blind review of results.	Journal uses Registered Reports as a submission option for replication studies with peer review before observing the study outcomes.

=> Increasing benefits of open science at the level of the funding agencies: prerequisite for getting grants

Ph.D. Dipl.-Psych.

German Psychological Society fully embraces open data, gives detailed recommendations

February 15, 2017

tl;dr: The German Psychological Society developed and adopted new recommendations for data sharing that fully embrace openness, transparency and scientific integrity. Key message is that raw data are an essential part of an empirical publication and must be openly shared. The recommendations also give very practical advice on how to implement these values, such as "When should data providers be asked to be co-authors in a data reuse project?" and "How to deal with participant privacy?".

“Data should be made accessible at a stage of processing that allows it to be usefully reused by third parties (raw data or structured data)”

OPEN ACCESS



Since its creation, the ERC has been supporting the principle of open access to the published output of research as a fundamental part of its mission. It also promotes the basic principle of open access to research data.

This page provides an overview of the rules related to open access to publications and research data management that apply to ERC grants. It also includes links to important open access repositories for publications and research data, and to useful registries and directories. Finally, there are also pointers to several resources summarising policies and mandates by publishers, funders and institutions and information on where to get help in case of further questions.

<i>Type of ERC grant</i>	<i>Work programme under which the proposal was selected</i>	<i>Applicable rules related to Open Access and Research Data</i>
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FWO: Clause Wetenschappelijke Integriteit

“Het FWO gaat er van uit dat elke onderzoeker van bij de indiening van een aanvraag kennis heeft genomen van deze codes en zich ertoe verbindt hun bepalingen te zullen volgen in alle stadia van het voorgestelde onderzoek.”

What is missing: UNIVERSITIES / GOVERNMENT

=> Belgian universities at best pay lip service: policy papers, but little concrete action to support their researchers in terms of RI / open science infrastructure (but see DMPonline.be)

=> Because of their reward structure, neither RI nor open science is a priority: too little, too late

=> INVEST in + REWARD RI and open science:
CORE BUSINESS

What is missing: Good practice examples

In different areas of science, especially areas where open science is difficult

TAKE HOME MESSAGES

Promoting open science is a good way of promoting RI

Promoting open science and RI requires changing its perceived benefits and costs

Things are changing at the level of infrastructure, journals, and funders

Universities are lagging behind