What should scientific journals do to foster research integrity?

Lex Bouter
Content

- Research integrity
- Research climate and publication pressure
- Selective reporting
- What can scientific journals do?
Research Integrity (RI) concerns behaviors of researchers that hamper validity (truth) of research or trust in science and between scientists.

Research Ethics (RE) concerns the ethical considerations of research with humans and animals.

Responsible Research & Innovation (RRI) concerns the benefits and harms of research for society and the environment.
Spectrum of research practices

How it should be done:
Relevant, Valid, Reproducible, Efficient

Sloppy science: Ignorance, honest error or dubious integrity

Scientific fraud: Fabrication, Falsification, Plagiarism

Responsibility Conduct of Research

Questionable Research Practices

Research Misconduct
What is good for the validity and reliability of science is not always good for your professional career.
Functioning of moral compass depends on:

- Individual virtuousness
- Research climate
- Perverse incentives
Content

- Research integrity
- Research climate and publication pressure
- Selective reporting
- What can scientific journals do?
Perceptions of research integrity climate differ between academic ranks and disciplinary fields: Results from a survey among academic researchers in Amsterdam

Tamarinde L. Haven¹ *, Joeri K. Tijdink¹,², Brian C. Martinson³, Lex M. Bouter¹,²
junior researchers perceive the research integrity climate more negatively than senior researchers

junior researchers note that their supervisors are too little committed to talk about key research integrity principles

PhD students perceive more competition and suspicion among colleagues than associate and full professors

researchers from the natural sciences have a more positive perception of the research integrity climate

Researchers from social sciences as well as from the humanities perceive less fairness of their departments’ expectations in terms of publishing and acquiring funding
RESEARCH ARTICLE

Perceived publication pressure in Amsterdam: Survey of all disciplinary fields and academic ranks

Tamarinde L. Haven*, Lex M. Bouter¹, Yvo M. Smulders³, Joeri K. Tijdink¹,⁴
Perceived Publication Pressure

- Publication pressure is a particularly detrimental stressor for postdocs and assistant professors

- Publication pressure concerns researchers from all disciplinary fields but is highest for researchers in the humanities

- Our findings emphasize the need to move the debate forward towards a healthy publication climate, where researchers are incentivised to optimize quality and integrity of their publications
Content

- Research integrity
- Research climate and publication pressure
- Selective reporting
- What can scientific journals do?
We need to talk about the elephants in the room

- Selective reporting
- Poor replicability
How things can go wrong

- personal interests
- QRP & RM
- sponsor interests
- (false) positive results
- citations
- publications
- media attention
- grants & tenure
How negative results disappear from the published literature
Replicability of studies is only 10-40%
Important causes of ‘replicability crisis’

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

Hypothesizing After Results are Known
Degrees of Freedom in Planning, Running, Analyzing, and Reporting Psychological Studies: A Checklist to Avoid $p$-Hacking

Jelte M. Wicherts *, Coosje L. S. Veldkamp, Hilde E. M. Augusteijn, Marjan Bakker, Robbie C. M. van Aert and Marcel A. L. M. van Assen

34 Researcher Degrees of Freedom that can be used to get Positive Results
Transparency of

Always prospectively

Publicly – if possible

Study Protocol
Analysis Plan
Amendments
Data Sets → Open Data
Reports → Open Access
The preregistration revolution

Brian A. Nosek\textsuperscript{a,b,1}, Charles R. Ebersole\textsuperscript{b}, Alexander C. DeHaven\textsuperscript{a}, and David T. Mellor\textsuperscript{a}

Progress in science relies in part on generating hypotheses with existing observations and testing hypotheses with new observations. This distinction between postdiction and prediction is appreciated conceptually but is not respected in practice. Mistaking generation of postdictions with testing of predictions reduces the credibility of research findings. However, ordinary biases in human reasoning, such as hindsight bias, make it hard to avoid this mistake. An effective solution is to define the research questions and analysis plan before observing the research outcomes—a process called preregistration. Preregistration distinguishes analyses and outcomes that result from predictions from those that result from postdictions.
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<td><strong>Citation standards</strong></td>
<td><strong>Article is not published until appropriate</strong></td>
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<td>and materials—or says nothing.</td>
<td>that follows journal's author guidelines.</td>
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Instructions to Authors

- Weighted random sample from Scopus (N=835)
- 19 topics: RI and transparency in reporting
- Absence or presence of topic in ItA
- Machine reading with manual checks
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<th>Health Sciences</th>
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<td>(n=835, $N_w=14,814$)</td>
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<td>Statistics†</td>
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<tr>
<td>TOP Guidelines</td>
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<td><strong>Average no. of topics per journal</strong></td>
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<td>6</td>
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</tbody>
</table>
Content

- Research integrity
- Research climate and publication pressure
- Selective reporting
- What can scientific journals do?
No quick fixes and many stakeholders

- Researchers
- Research institutes
- Funders of research
- Scientific and scholarly journals
What can scientific journals do?

1. follow the TOP guidelines and be as transparent as possible
2. demand preregistration or introduce registered reports to avoid selective reporting
3. use reporting guidelines to make publications more clear and informative
4. promote preprints with a view to avoid delay and improve quality
What can scientific journals do?

5. have open peer review and give reviews a DOI and be as transparent as possible

6. check for spin, reporting of study limitations, text recycling and image duplication to improve quality and trustworthiness

7. promote post-publication peer review to allow scholarly debate after publication

8. allow updated versions to enable later correction of errors and omissions
Registered Reports

- Develop Idea
- Design Study
- Collect & Analyze Data
- Write Report
- Publish Report

Stage 1: Peer Review
Stage 2: Peer Review

Adopted by 201 journals
Enhancing the QUAlity and Transparency Of health Research

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<th>Study Type</th>
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<td>Observational studies</td>
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<td>Systematic reviews</td>
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<td>Case reports</td>
<td>CARE</td>
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<td>Qualitative research</td>
<td>SRQR</td>
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<td>Diagnostic / prognostic studies</td>
<td>STARD</td>
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<td>Quality improvement studies</td>
<td>SQUIRE</td>
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<td>Economic evaluations</td>
<td>CHEERS</td>
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<td>Animal pre-clinical studies</td>
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<td>Study protocols</td>
<td>SPIRIT</td>
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<td>Clinical practice guidelines</td>
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N = 413
Preprints and Post-publication Peer Review

arXiv.org
PsyArXiv
ChemRxiv
PUBPEER The online Journal club
MedRxiv
bioRxiv
ASAPbio
RESEARCH NOTE

Causes of reporting bias: a theoretical framework [version 1; peer review: 2 approved with reservations]

Jenny T van der Steen 1,2, Oebele ter Riet 1,3, Cornella A van den Bogert 1, Lex M Bouter 1,67

This article is included in the Science Policy Research gateway.

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. 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 positive 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 reporting 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

Causality, publication bias, questionable research practice, reporting bias, research design, selective reporting
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