

Killing the messenger: should scientific journals be responsible for policing scientific fraud?

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The responsibility lies with the scientific community

Since, both in importance and in time, health precedes disease, so we ought to consider first how health may be preserved, and then how one may best cure disease.

Galen, AD 130–200

The article on scientific misconduct by Gerber in this issue of the Journal (*page 632*) calls for more vigilance on the part of editors and peer reviewers in exposing fraudulent research.¹ A recent commentary in the *New York Times* also vigorously questions the merits of peer review and the role of scientific journals in light of recent disclosures of fraudulent research published in high level journals and asks for more credibility on the part of editors as science gatekeepers.²

All this begs the question: why do editors and scientific journals come into the spotlight each time there is a new and shocking discovery of scientific fraud? Are they really the guilty party for publishing fraudulent research articles? As articles in scientific journals are the main form of scientific communication and documentation of research,³ members of the public mostly see scientific fraud as a deficiency in the publication process and focus on “the messenger” rather than on the true causes of scientific fraud. Instead of considering how to preserve the “health” (ie, responsible conduct) of research,⁴ it is left to editors and peer reviewers to look for ways to treat the “disease”.

Is this fair, especially in view of the fact that scientific journals have been instrumental in gathering evidence about fraudulent science³ and in detailing problems of peer review and publication?⁵ Their evidence, and the exposure of each new case of scientific fraud, increases the awareness that this issue must be very seriously and creatively considered by the whole research community — not only at the end stage of the research by those involved in the publication process. Although many say that fraud is a substantial problem and blame editors for downplaying its significance,^{1,2} when we look for evidence, the estimated prevalence of fraudulent articles in international journals is about 0.2% of published articles.³ The prevalence of fraudulent articles may be higher in smaller journals with little scientific impact,⁶ but their authors rarely get discovered because the articles are either not read or not cited by the wider scientific community.

An important element of scientific misconduct is the personal responsibility of individual scientists who are involved in the research and whose names ultimately appear on the published article. The Hwang scandal clearly illustrates that, although all authors usually get the same or similar benefits from a published article, the authors are not the same in the face of scientific fraud: many are quick to accept praise and benefits flowing from a high-profile publication, but many also evade the responsibility we expect from all authors — responsibility for their published work.¹

Even the International Committee of Medical Journal Editors (ICMJE) has pulled back from its strict requirement, in the 1988

revision of the *Uniform requirements for manuscripts submitted to biomedical journals* (URM), that “each author should have participated sufficiently in the work to take public responsibility for the content”.⁷ The requirement in the current edition of the URM⁸ is that “each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content”. The move away from requiring shared responsibility of all authors for the whole manuscript opened a loophole for authors of fraudulent articles to escape embarrassment and perhaps legal action, as they can always claim that they were not responsible for the questionable part of the research.

This was the case with Professor Schatten and the University of Pittsburgh in the Hwang case.¹ Schatten was an advisor in the research conducted by Hwang and colleagues. Although he was listed as a co-author on the offending articles, he, unlike Hwang, was found guilty of scientific misconduct rather than fraud. We believe that the change to the ICMJE authorship criteria was a wrong move by the editors who defined such criteria. Wouldn't it be better and more natural for all authors of a manuscript to meticulously analyse data produced by their team and ensure the veracity of the evidence presented, rather than transferring this responsibility to editors and reviewers? In the absence of this process, it is not surprising to see strong criticism of journals, editors and the peer review process and to hear demands that key data for most manuscripts be made available to reviewers.^{1,2} Although this seems like a rational proposal, it would have to be counterbalanced by ensuring that the reviewers, who are often the authors' competitors in the field, do not misuse their privileged access to the data.

The process of scientific discovery is a human endeavour and, as such, is burdened by the imperfections of human nature and ability. In other words, a degree of dishonesty can and perhaps must be expected in this process. The system of entrusting money to someone (a scientist or group of scientists) to do research contains an inherent imperfection: there is no guarantee that the endeavour will succeed, because it aims towards the unknown. Consequently, the key principle of scientific research is relatively poorly founded trust. Having trust as the only safety mechanism leaves the research process open to the risk of failure — and fraud. Trust and honesty present one side of the equilibrium of scientific integrity, and have to be balanced against pressures for publication output. To use an analogy with the economic rationalisation for crime,⁹ scientific fraud can be considered as a rational act of balancing the expected utility of scientific promotion against the expected cost of punishment. If we want a fraud-free equilibrium, the scientific community must find ways to ensure that the costs of fraud and assisting in fraud are high while the cost of informing about fraud is low.¹⁰ That is why the problem of scientific fraud cannot ultimately be solved by better peer review or more stringent editorial processes.¹¹ It requires active and preventive work by all

those involved or affected, starting with the research and academic community itself.^{4,12}

Competing interests

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