

EDITORIAL

Publish with Integrity: Ethics as the Foundation of Scientific Knowledge

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Trust as the Foundation of Scientific Work

Every time we approach a scientific article, we do so based on a trust that is rarely made explicit—the assumption that the data exist and were collected rigorously, that the images faithfully represent what they are intended to show, and that the authors of the work actually participated in its creation. Because of its tacit nature, this trust underpins the edifice of knowledge; when it crumbles, it compromises not only a single article but also the credibility society places in science and in those of us who have dedicated our careers to advancing it.

In the previous issue of this journal, it was argued with remarkable clarity that responsibility cannot be entirely delegated to algorithms and that ethics remains an essentially human endeavor—an approach I wish to revisit and apply to an area that directly concerns those of us who conduct research and publish, that of integrity in scientific publishing, insofar as no technology, however sophisticated, can replace the personal decision to act with integrity even when no one is watching.

What Retractions Tell Us

A retraction is the mechanism by which science publicly acknowledges that something has gone wrong, and for a long time it was an almost exceptional phenomenon, since before the year 2000, fewer than 100 articles were retracted annually worldwide—a figure that by 2014 had risen to nearly 1,000, according to the analysis conducted by Brainard and You (2018) for the journal **Science** based on the Retraction Watch database. The subsequent trend is even more revealing, given that in 2023 alone, more than 10,000 articles were retracted—a historic record in which more than 8,000 were from journals published by a single publisher affected by large-scale fraud in its special issues, causing the retraction rate to exceed 0.2% of published articles for the first time (Van Noorden, 2023).

These figures, however, should be interpreted with caution, as not every increase in

retractions implies that current science is of lower quality than that of previous decades; part of this growth is due to the proliferation of journals, the development of detection tools, and an academic community that is more vigilant regarding published literature (Brainard and You, 2018). Even so, an analysis of the causes paints a troubling picture, as evidenced by the study by Fang et al. (2012) published in PNAS, in which a review of 2,047 retracted biomedical articles revealed that 67.4% had been retracted due to some form of misconduct—whether fraud or suspected fraud, duplicate publication, or plagiarism—while honest error accounted for only about one-fifth of the cases, suggesting that in most instances the problem lay not in a mistake but in a decision.

Beyond Fraud: Practices That Become the Norm

It would be convenient to assume that misconduct is limited to a few scandalous cases, but the available evidence points to a more nuanced—and therefore more uncomfortable—picture. In a meta-analysis published in PLoS ONE, Fanelli (2009) found that nearly 2% of researchers admitted to fabricating or falsifying data at least once and that up to one-third acknowledged other questionable practices—proportions that increased considerably when asked about what they had observed among their colleagues. These findings were echoed years later in a national survey of more than 6,000 researchers in the Netherlands, according to which more than half had frequently engaged in at least one questionable practice during the previous three years, including the omission of unfavorable results, selective citation, or inadequate supervision of others' work (Gopalakrishna et al., 2022).

Bik et al. (2016) also identified less visible forms of manipulation when they examined more than 20,000 articles containing laboratory images and found problematic duplications in 3.8% of them, many with signs of deliberate tampering. Adding to this is the silent growth of so-called “article mills”—companies that trade in fraudulent manuscripts and authorships—which have infiltrated indexed journals across various disciplines (Else & Van Noorden, 2021). This body of evidence echoes the warning issued two decades ago by Ioannidis (2005) in PLoS Medicine, who demonstrated that biases, incentives, and pressure to produce eye-catching results can undermine the reliability of a significant portion of what is published.

The Pressures We Must Not Ignore

It would be unfair to address the ethical dimension without considering the context in which research is conducted, since at many universities—and Latin America is no exception—academic careers are increasingly evaluated based on the number of articles, the journal's quartile ranking, or the number of citations; in some cases, financial bonuses are even

awarded for publication. Such incentives, originally designed to stimulate knowledge production, can end up prioritizing speed over rigor and pushing young researchers—often tied to precarious contracts—toward shortcuts they would not have considered under different circumstances. While this does not justify misconduct, it does compel us to recognize that integrity is also an institutional issue and that the rules governing academic evaluation have consequences.

In this regard, the call by the Declaración de San Francisco sobre la Evaluación de la Investigación (DORA, 2012) to abandon the journal's impact factor as a criterion for judging scientific work and to evaluate, instead, its quality, content, and actual contribution—just as the Singapore Declaration on Research Integrity (World Conference on Research Integrity, 2010) reminds us that honesty, accountability, professional courtesy, and the proper stewardship of resources are not incidental elements of scientific work, but rather its very foundation.

Striving for Integrity: A Shared Responsibility

Given this situation, it is worth asking what those of us who conduct research and publish should do, and I believe the answer begins with simple practices that, sustained over time, shape a culture of integrity. These include recognizing as authors only those who made a genuine contribution—without excluding anyone who actually did so—preserving and, whenever possible, sharing data and procedures so that others can examine our work, reporting results that did not confirm our hypotheses, since science is built just as much on what did not work, citing sources honestly rather than for convenience, declaring conflicts of interest, and—now more than ever—being transparent about the use of artificial intelligence tools in writing and analysis, as recommended by the guidelines of the Committee on Publication Ethics (COPE, 2023).

It is also worth emphasizing the importance of correcting our mistakes, since retracting an article due to an honest error should not be seen as a source of shame, but rather as an act of responsibility that strengthens trust in the author. Journals should support this process with clear, respectful procedures, while universities should foster integrity from the earliest years—not through a single course, but as a practice learned daily in undergraduate programs, research groups, and the educational relationship between teachers and students.

Conclusions

Scientific integrity is not a mere formality or a list of prohibitions, but rather a way of positioning oneself within the world of knowledge; and while the statistics on retractions and misconduct raise legitimate concerns, they also offer an opportunity to reflect on the

kind of science we aspire to build and the kind of researchers we wish to be. If this era of rapid transformation teaches us anything, it is that technology can help detect fraud, but only people can decide not to commit it—and it is precisely in that intimate, everyday decision that much of the future of public trust in science hangs in the balance, and where academia undoubtedly assumes its deepest responsibility.

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