



Description

A growing number of high-profile corrections and mass retractions has put [peer review](#) squarely in the spotlight: when the gatekeeping system fails, the consequences extend beyond a single retraction to public trust in science, policy, and researcher careers. A [review](#) of retraction causes found that *fake or manipulated peer review* became a major reason for withdrawal of articles since the 2010s, and recent publisher investigations continue to uncover large-scale manipulation in special issues and submission streams.

What peer review is and why it matters

Scholarly *peer review* is the process by which manuscripts are evaluated by experts before publication to assess validity, originality, and fit for a journal. It serves as a quality-control filter and a community endorsement mechanism that supports reproducibility, guides editorial decisions, and signals credibility to readers. Peer review is not infallible: it relies on volunteer expertise, editorial oversight, and systems that can be exploited.

Traditional pre-publication peer review remains central, but the landscape now includes stronger preprint discussion, automated screening tools, cross-publisher intelligence and more active post-publication scrutiny. These layers aim to distribute responsibility across the research lifecycle rather than concentrating it solely at editorial triage.

When and how peer review fails

- **Fake or manipulated peer review:** Authors or third parties supply fabricated reviewer identities or hijack editorial workflows so that bogus, favorable reviews reach editors. This tactic has been repeatedly linked to mass retractions.
- **Paper mills and generated content:** Organized entities produce manuscripts or data that mimic legitimate research; these submissions can pass cursory checks and reach publication if reviewer scrutiny or screening tools are insufficient.
- **Conflicted or inappropriate reviewers:** Reviewers with undisclosed conflicts, competing interests, or insufficient subject expertise can miss flaws or skew assessments. Editors sometimes struggle to verify reviewers' independence.
- **Editorial process failures:** Guest-edited special issues, rushed handling during surges of

submissions, or poor verification of suggested reviewers create vulnerabilities. There have been [documented cases](#) where special issues produced dozens or hundreds of problematic papers.

- **Limitations in Detecting Fraud:** Peer review rarely uncovers fabricated raw data or covert manipulation; it is designed to evaluate plausibility, methodology, and interpretation not always to detect deliberate fraud.

What happens when peer review fails: immediate and downstream consequences

- **Corrections, expressions of concern, and retractions:** Journals may issue an expression of concern while investigating, and retract papers when evidence shows the findings are unreliable or the review process was compromised. COPE guidance outlines when and how these actions should be taken to protect the record.
- **Waste of resources and reproducibility harms:** Time and funding are squandered by teams trying to build on unreliable results; follow-on work can propagate error into meta-analyses and policy. [Efforts to limit inadvertent citation of retracted work](#) are now a community priority.
- **Reputational damage and career consequences:** Individuals and institutions connected to retracted work face scrutiny; some cases have led to dismissals, revoked degrees, and lasting reputational harm (for example, [the Schön scandal](#) illustrated how fraud that passed peer review caused broad fallout in disciplines).
- **Erosion of public trust:** High-visibility failures especially in health or policy-relevant fields can undermine public confidence in science and slow uptake of legitimate findings.

Real-world examples that illustrate differing failure mechanisms

- **Fake-review mass retractions:** Several publishers have retracted dozens or hundreds of papers after investigations found coordinated reviewer fraud and manipulated submissions; special-issue workflows were particularly vulnerable.
- **Scientific fraud detected post-publication:** The Jan Hendrik Schön affair (physics) and the [Diederik Stapel case](#) (social psychology) show how fabricated or manipulated data can survive peer review until replication attempts, whistleblowing, or formal inquiries reveal the truth leading to multiple retractions and institutional investigations.

How failures are detected and how the record is corrected

Detection occurs through multiple channels: editorial audits, cross-publisher screening tools, whistleblowers, post-publication peer review platforms (e.g., PubPeer), and independent sleuthing by researchers. Once concerns are credible, journals follow COPE flowcharts and [retraction guidelines](#) to issue expressions of concern, corrections, or retractions, and to notify indexing services so the scholarly record reflects the change. Recent industry collaborations and tools seek to catch problems earlier.

What is changing: publisher and system-level responses

Publishers and industry consortia are building shared defenses. [The STM Integrity Hub](#) and related

screening tools are designed to spot indicators of paper-mill output, duplicate submissions, or reused reviewers across multiple journals and platforms creating an early-warning system that can block suspicious manuscripts before peer review progresses. These ecosystem-level responses complement COPE policies and editorial best practice.

Practical guidance: what researchers, reviewers and editors can do now

Researchers

- **Use transparent reporting and data sharing:** Make raw data, code, and protocols available where appropriate (links, repositories). This strengthens reproducibility and reduces the chance that honest errors are mistaken for misconduct.
- **Avoid third-party submission services of uncertain provenance;** if using external support, document what was outsourced and ensure full author oversight.
- **Treat suggested reviewers with caution:** provide independent reviewers when asked, and avoid recommending close collaborators without declaring the relationship.

Peer reviewers and editors

- **Verify reviewer identity:** Use institutional email addresses, ORCID IDs, and editorial-system checks rather than relying solely on author-supplied contact information.
- **Screen submissions early:** Use plagiarism-detection, image-forensics, and paper-mill screening tools where available; flag suspicious clustering of submissions around guest editors or within narrow topic windows.
- **Apply COPE flowcharts when concerns arise and publish clear, detailed notices to correct the literature promptly.**

A short checklist for immediate action (for researchers and journal offices)

- **Verify reviewer emails and ORCID records** before inviting or accepting reviews.
- **Run plagiarism and image-analysis checks** at submission triage.
- **Maintain transparent data and method availability** (repositories, supplementary files).
- **Publish expressions of concern** when investigations are ongoing and retract promptly when findings are unreliable.
- **Join or consult cross-publisher integrity tools** (where possible) to detect patterns indicative of paper mills or duplicate submissions.

Points to note and common mistakes

- **Peer review is necessary but not sufficient:** it mitigates many errors but does not guarantee detection of deliberate fabrication. Treat peer review as one layer in a broader integrity system.
- **Over-reliance on author-suggested reviewers increases risk:** editor-managed selection and verification reduce exposure to fraudulent reviewer identities.

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- **Bulk corrections are painful but sometimes necessary:** correcting the record even via large-scale retractions is part of maintaining integrity; transparency about reasons helps the community learn.

Conclusion: restoring trust through layered defenses and good practice

Peer review continues to be a vital mechanism for quality assurance, but it is not a panacea. When peer review fails, the remedies expressions of concern, corrections, and retractions restore the literature but cannot always undo the lost time, diverted resources, or reputational harm. Researchers should therefore adopt transparent reporting, careful selection of collaborators and services, and proactive data sharing. Editors and publishers should verify reviewer identities, use screening tools and industry collaboration, and follow COPE guidance for clear, timely corrections. Together these steps make peer review more resilient and protect the credibility of scholarly communication.

Category

1. Articles
2. Reporting Research

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