

Increasing number of paper retractions

Correcting Science

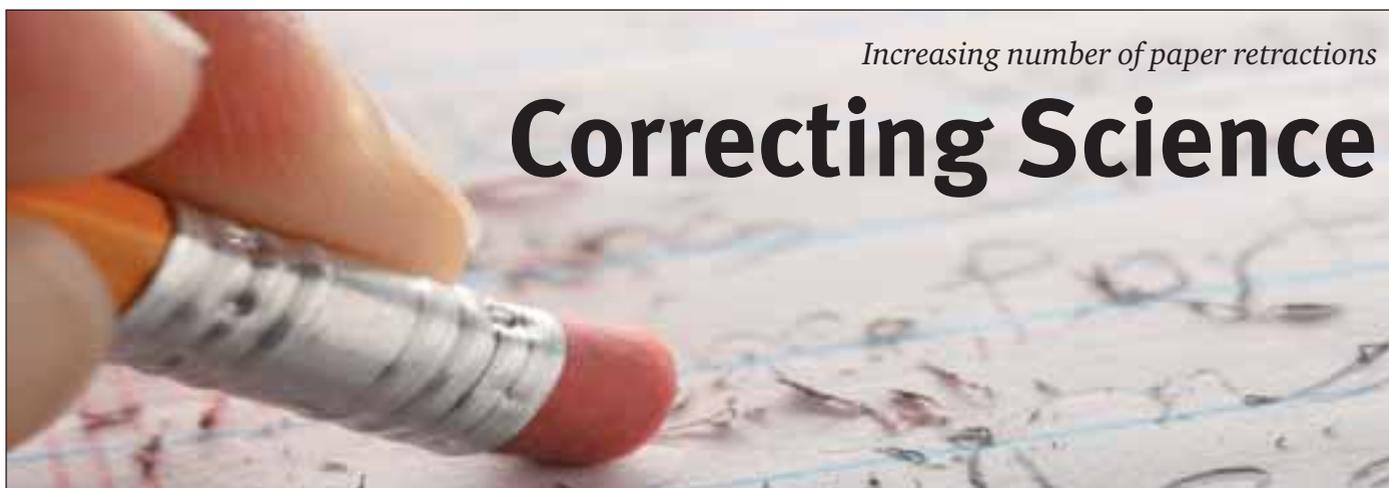


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Lately, it would seem that published research results have to be taken with a pinch of salt. It could very well happen that only a couple of weeks or months later those very same results are taken back or retracted. Has the search for truth temporarily lost its way?

As a curious scientist, you usually search on websites like *Nature News* or *Science Insider* to read about extraordinary discoveries or achievements in science. Recently, though, you are, more often than not, rather unpleasantly surprised with headlines, such as “Gene therapy researcher retracts four papers”, “Nobel-winning brain researcher retracts two papers” or “Highly cited Harvard stem cell scientist retracts *Nature* paper”. Thus, research that used to be extraordinary is no longer good and bad science obviously has to be wiped from the collective scientific mind. In the world of science publishing this is done with a “retraction”, a tool to take that faulty paper “off the streets”. But when and how is a retraction issued, and by whom? And does it always come hand-in-hand with the nasty companion “fraud”?

Unreliable findings

Retractions or withdrawals can be issued by both journal editors or the authors themselves. According to the Committee on Publication Ethics, COPE, who published a few guidelines for journal editors last year, a retraction should be considered only if the editor has “clear evidence that the findings are unreliable”. Those inconsistencies can arise from unintentional errors but there’s always the possibility of malicious intent like data fabrication, double publication, plagiarism or unethical research. Furthermore, the COPE makes another important point, “The main purpose of retractions is to correct the literature and ensure its integrity rather than to punish authors who misbehave.”

A retraction, though, is only the last button to push for an editor. If evidence of misconduct is still scant, the editor can issue an “expression of concern”. Not so long ago, this happened with the now infamous “Reactome Array” study by Beloqui *et al.* (*Science* 326 (5950):252-7). *Science* Editor-in-Chief, Bruce Alberts, was more or less forced to express his concern as several researchers doubted that everything in this paper went according to the laws of chemistry. Subsequently, intensive investigations took place and confirmed earlier doubts. The case, however, is still open and the paper not yet withdrawn from the database.

The third option for an editor is to issue a correction. This is only done to correct a minor mistake that doesn’t have an effect on the conclusion of the article.

But let’s go back to the more serious cases! The first retractions ever issued by scientific journals date back to the 1970s. Back then it was a clear misconduct case, which led to several papers being retracted. A PhD student, first in the lab of Charles Rowe at Birmingham University, then in the lab of Bernd Hamprecht at the Max Planck Institute for Biochemistry in Munich, confessed to have simply “invented” his results. Normally, your supervisors want you to be creative but this is probably not exactly what they had in mind. The Retraction Note sent in by Rowe reads, “Certain observations reported previously from this laboratory have not proved reproducible.” And later “[...] failure to reproduce key observations must inevitably cast doubt on other aspects of the work.” Thus, all in all, ten papers had to be retracted in the spring of 1977; five of them were published in *FEBS Letters*, *Nature* and the *Biochemical Journal*.

New software helps publishers

Since the groovy seventies, retractions have, according to some studies, become more and more popular. Redman *et al.*, for example, analysed retractions issued between the years 1995 and 2004, which had been entered into PubMed. Of about 5,000,000 papers only 328 had been retracted, which, relatively seen (0.0065%), is a rather low number but the authors attest that even though “the rate of retractions remains low [it] is increasing” (*J Med Ethics* 34:807-9). To prove that, they pulled up an older study by Budd *et al.* Between 1966 and 1994, more than thrice the period analysed by Redman *et al.*, only 235 (0.0021%) cases were made public (*JAMA* 280:296-7). But has the search for truth really run aground in recent years or are just more cases of research-gone-wrong being detected? There are indeed some new technologies like anti-plagiarism software available, which makes it a lot easier for publishers to seek out those that chose to go the easy way. However, despite the fact that it’s usually the misconduct cases that make the news, retractions can be the result of “honest mistakes” or other rather curious reasons, too.

For example, in 2007 *The New York Times* reported on the partial retraction of a 52-year old paper by the author Homer Jacobson, a former chemistry professor at the Brooklyn College, himself. In “Information, Reproduction and the Origin of

Life”, published in *American Scientist*, Jacobson speculated that some chemical compounds could have survived when the newly formed earth was starting to cool down. This, however, was right down the alley of some creationists, who began to cite this paper as proof for their theories. Jacobson only found out about that decades later and, consequently, partially retracted the paper. In a letter to the editors he writes, “Retraction this untimely is not normally undertaken, but in this case I request it because of continued irresponsible contemporary use by creationists who have quoted my not merely out-of-context, but incorrect, statements, to support their dubious viewpoint. I am deeply embarrassed to have been the originator of such misstatements, allowing bad science to have come into the purview of those who use it for anti-science ends.” (www.americanscientist.org)



photo: Fotolia/Anja Linder-Rottke

“Did those scientists just give me ecstasy or methamphetamine?”

Another religiously-themed example takes us to the Holy Land, where none other than Jesus reportedly healed a woman from the flu. Only three weeks after “Influenza or not Influenza: Analysis of a case of high fever that happened 2000 years ago in Biblical Time” was published, the editors of the *Virology Journal* all of a sudden realised that “the observations made are mostly speculative” and asked the authors to retract it. (*Virology J* 7:190)

From misinterpretation to miscommunication

In 2003, things got a little ecstatic when the authors of “Severe Dopaminergic Neurotoxicity in Primates After a Common Recreational Dose Regimen of MDMA (“Ecstasy”)” discovered that “the two bottles of drug might have borne incorrect labels”. So instead of ecstasy the primates were actually tripping on methamphetamine. Needless to say, one year after publication the paper was retracted (*Science* 301(5639):1479).

Further examples of more or less “honest” mistakes are aplenty. Ranging from misinterpretation of data (*BMJ* vol. 327(7420): 929) over miscommunication between corre-





Interview Ivan Oransky (*Retraction Watch*)

“Trust Requires Transparency”

Ivan is one of the founding members of a blog that publicises recently retracted papers.

Do you think that the number of retractions has really increased in recent years or are just more cases being detected (new software etc)?

Oransky: I think it's hard to say based on a few months of evidence but a 2008 study suggests the number is increasing (*J Med Ethics* 34:807-9). That's not surprising given the proliferation of new journals, many of which have shorter turnaround times. It's also true that software, such as CrossCheck is making plagiarism easier to spot.

What's your “favourite” case so far?

Oransky: That's a hard call to make! But I think our favorite – and our readers' favorite, by pageviews – would be the retraction of a paper in *Virology Journal* about whether Jesus cured a woman with flu. It's a good example of some of the bizarre stuff we've come across. We find enough examples of serious misconduct or inability to replicate results, both of which obviously affect scientific fields. But often the retractions are just amusing, as in this case (*Virology J.* 7:169).

What impact do you think your blog has?

Oransky: I think it's really too early to tell, as we've been around for less than three months. The response, however, has been overwhelmingly positive. Based on a few conversations we've had, some medical societies and publishers have wished

there was a database of retractions. We're hoping *Retraction Watch* can serve that function, at least in an informal way.

Is there already enough done to make researchers aware of retractions? I believe you depend on “tip offs” yourself?

Oransky: We don't think enough is being done to make researchers aware of retractions. I would argue that the press should always be notified of retractions. That's particularly true when a retracted study was originally press-released. After all, if the findings were important enough to be the subject of media attention, shouldn't the retraction also be covered?

Who gives you those tip-offs?

Oransky: We get a lot of tips from journalists and bloggers who cover specific fields. And unless there's some reason our tipsters want to remain anonymous, we always credit them. Now that the word has spread about the blog, we're starting to hear from researchers about papers, about which others have raised serious questions. That will allow us to start reporting on studies about to be retracted. As someone put it to us, retracted studies are just the tip of the iceberg.

What's your experience when you contact journal authors, editors, publishers about recent retractions?

Oransky: It's mixed. Some authors, editors, and publishers are very transparent about the reasons for a retraction and will get back to us right away. Others won't comment at all; researchers refer us to press officers and journal editors refer us

to publishers. We find that disappointing. Trust requires transparency.

Many cases of retractions come from China (you talked about it in one of your blog entries, too), any ideas why?

Oransky: There seems to be a high rate of plagiarism in at least one prominent Chinese journal, as reported by *Nature*. But it's really too soon to say whether a higher percentage of retractions come from China. After all, it's home to 20% of the world's population. We'll be tracking this and two crusading Chinese journalists have been, too – at their peril.



One of the more “bizarre” cases of retractions

What influence do retractions have on the reputation of science in the public eye?

Oransky: I think that retractions can only bolster the reputation of science. They're a sign that science is self-correcting and that it recognises that people make mistakes. Our argument is similar to the one that Craig Silverman makes about corrections by journalists. (“I aim to provide a non-partisan resource to serve both the press and the public; my overall goal is to help make news reporting more accurate and transparent.”) (www.regrettheerror.com)

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► sponding and co-authors (*Contrib Nephrol.* 167:VI) to more formal errors like a missing permission to publish patients' photos (*Clin Anat.* 23(4):495) or depositing a newly discovered bacterial species in a culture collection of not one but two different countries (*Int J Syst Evol Microbiol* 60:268).

Retractions then don't always have to do with fraud, however, dishonest research, it seems, has started to play an increasingly bigger role. A 2009-study conducted by Elizabeth Wager, chair of COPE, and Peter Williams from the Department of Information Studies at the UCL, found that 42% of retractions between 1988 and 2008 were due to misconduct. Redundant publication in two or more journals made up the biggest share (17%), followed by plagiarism (16%), data fabrication (5%) and data falsification (4%). Only 28% of all retractions were found to be due to “honest research errors” (www.publicationethics.org).

Déjà-vu

However, only a few years further back, Nath *et al.*, found the exact opposite to be true. The authors analysed 395 retractions issued between 1982 and 2002 and found that a staggering 62% were caused by “unintentional errors”. Only 27% were due to scientific misconduct (*Med J Aust* 185(3):152-4). Besides those results, Nath *et al.* brought up another interesting aspect. Top journals like *Science*, *PNAS* and *Nature* not only have the highest impact factors but also “the highest number of retractions”. The authors, however, claim, “It seems highly unlikely that these journals are prone to publishing shoddy research. [...] It is likely to be easier for errors to slip by undetected in less widely read and cited journals.”

Sometimes, though, journals do make mistakes. Or maybe the publish-or-perish mentality has finally spilled over to the publishers as well? *Haematologica* recently had to retract three papers because it double-published every single one of them (*Haematologica.* 95(9):1620). According to the Editor, Mario Cazzola, this was because of “some mistakes made by our production office”. As unlikely as it sounds, double-publishing doesn't seem to be too rare a case as, not long ago, the exact same thing happened with a study

published in *Aging & Mental Health*. At least the publishers knew who was to blame for this blooper, “Taylor & Francis would like to apologise unreservedly for any confusion caused and note that this was not the fault of the authors.” (*Aging & Ment Health* 14(6):769.)

The citation issue

This being said, it’s now clear that not all retractions are the same. Therefore, retraction notices should clearly state the reason for retraction and should be available to everyone. Something that hasn’t yet been implemented by all journals.

But that’s not all that needs to be optimised. Studies have shown that retracted articles are still cited even though they should have been erased from the scientific record. In a Correspondence with *Annals of Thoracic Surgery*, Nigel Drury and Daini Karamanou from the University Hospital Birmingham, UK looked at retracted papers and their citations after a “near-miss in referencing such an article” themselves. The pair analysed nine retracted articles and found 40 citations accompanying them, those were then cited a further 263 times. They furthermore found that 33 of the 40 primary citations “were more than one year after the date of retraction, including six in the same journal” (*Ann Thorac Surg*. 87:670-8).

Alerting researchers more efficiently

So what can be done to avoid citations of a retracted paper? Do papers that cite a now retracted paper have to be retracted too because they base their hypothesis on wrong assumptions? At least for the first question there could be a solution. Kallevi Korpela from the Department of Psychology at the University of Tampere, Finland recently called for “retraction databases and widespread availability of computer software to check lists of references free of charge in any database or the internet” (*Curr Med Res Opin*. 26 (4): 843-7). With this database, every manuscript could be checked before submission for invalid scientific literature. That would be a good starting point!

But more could be done; one thing would be to alert researchers more efficiently to retractions. This concerns especially low-profile cases that would otherwise go unnoticed. For this to happen, Ivan Oransky and Adam Marcus created the blog “Retraction Watch” in August of this year (<http://retractionwatch.wordpress.com>). Both of them are editors of science magazines themselves, Oransky is currently the executive editor of *Reuters Health*, Marcus acts as the managing editor of *Anesthesiology News*. In their very first blog entry entitled “Why write a blog about retractions?” they give their four reasons for creating the website: “First, science takes justifiable pride in the fact that it is self-correcting. Retractions are therefore a window into the scientific world. Second, retractions are not often well-publicised. We hope that this blog will form an informal repository for the retractions we find. Third, they’re often the clues to great stories about fraud and other malfeasance. Finally, we’re interested in whether journals are consistent.” The blog format is also supposed to kick-start “larger discussions on the obligations of journals”.

So far, it seems that almost every week one new case, mostly in connection with misconduct, is uncovered. Something Oransky didn’t quite anticipate, “We weren’t quite sure how many retractions to expect. We may have simply launched at a time when there are a lot more retractions than average. We’ll have to see,” he wrote in an email to *Lab Times*. Their blog entries not only state the cases but they also take the trouble to contact all people involved, authors, editors and publishers. A valuable service as in many cases you don’t read much about a retraction from anyone. In October, the blog had already accumulated 800 page views per day and that number is bound to increase as much as the number of retractions.

Keeping watch

Retractions, though, don’t necessarily have to be final. In what might be the rarest of all cases, the *Journal of Neurology, Neurosurgery & Psychiatry* recently restored an article it retracted four years ago. Originally, the article had been kicked out of the scientific record due to “administrative errors” but was now, almost invisibly, reinstated on the journal’s Post Script pages (*J Neurol Neurosurg Psychiatry* 81:942). However, in an interview with *Retraction Watch*, Janet O’Flaherty, publisher of *JNNP*, revealed a few more details, “Initiated by a request from the patient, and after further discussion with the BMJ Group’s professional advisors, the retraction was rescinded in August 2010.”

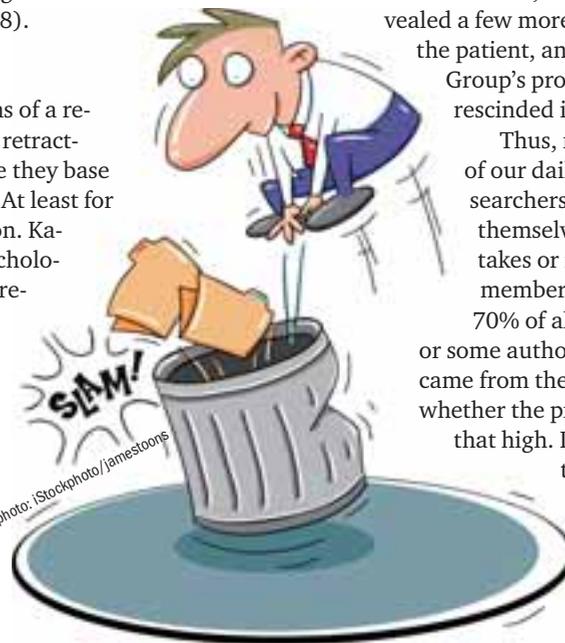
Thus, retractions seem to have become part of our daily scientific lives. At least most researchers seem to be honest enough to turn themselves in, when noticing their own mistakes or misconduct of, usually, former lab members. According to Redman *et al.*, about 70% of all retraction notices were issued by all or some authors of a paper in question, only 17% came from the editor/publisher. It makes you wonder whether the pressure to publish ANYTHING is really that high. Do scientists nowadays have to act true to the motto: First submit, then check again! However, when working in science you need to maintain a certain amount of trust in your colleagues and also in yourself.

Cleaning the scientific record

But it’s the editor’s/publisher’s task to officially set the scientific record straight again. It seems, however, that many editors are still too reluctant to retract an article for fear of legal consequences or damaging their journal’s reputation. Elizabeth Wager (COPE) wants to change that attitude, “I think that a retraction should be seen as a mark of honour for a journal. It’s a sign that they did the right thing and corrected a problem,” she said in an interview with *the Scientific American* (www.scientificamerican.com). And with a change of attitude, maybe a change of current guidelines to general rules is needed, too. Additionally, websites like *Retraction Watch* could help to bring retracted papers to everyone’s attention.

So, there are still a couple of things that need to be improved before the self-correction mechanism of science is running smoothly and the scientific record can be regarded as clean, once again.

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Bad science needs to be trashed immediately