

Driving Force

Should a scientific journal article be retracted if its conclusions are wrong?

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Virginia Barbour and Kasturi Haldar recently wrote a [clarification](#) of the [criteria](#) that the Public Library of Science (PLOS) journals use to decide when to retract a paper. One particular comment in this piece raised many eyebrows in the scientific community: “If a paper’s major conclusions are shown to be wrong we will retract the paper. By doing so, and by being open about our motives, we hope to clarify once and for all that there is no shame in correcting the literature.” Barbour has since [clarified](#) this statement in the comment section on the Retraction Watch blog and wrote that this particular quote has been “over/misinterpreted.” Regardless, the discussion that this remark created raises interesting questions about the scientific publication process.

The PLOS editorial was written in response to the [retraction](#) of a 2006 paper published in PLOS Pathogens. The paper provided evidence for the existence of a newly discovered virus, the xenotropic murine leukemia-related virus (XMRV), and a link between the virus and prostate cancer. [XMRV has gotten a lot of press because of its potential link to prostate cancer and because at one point it was thought to cause chronic fatigue syndrome—although the paper that presented this idea was [retracted by Science](#).] The retraction of the PLOS Pathogens article was hot on the heels of PLOS One’s publication of a [new paper](#) by some of the same authors that showed there is no evidence for a link between XMRV and prostate cancer. In fact, the XMRV originally found in tissue samples was actually due to contamination from a cell-line used in the lab ([a common problem](#)). It is important to note, however, that the original paper was the first to report the existence of XMRV (a real virus) and there is no evidence of scientific misconduct in the study. Regardless, it was retracted almost immediately after the publication of the new paper—much to the [surprise](#) of at least one of the authors. There was some outcry over this, which led to the editorial on the PLOS blog.

All this leads us to two questions: (1) should this specific paper have been retracted and (2), in general, should a paper be retracted if its findings and/or conclusions later turn out to be wrong? In her comment at Retraction Watch, Barbour mentions that retractions are “a useful tool in correcting the literature and do have a place when a piece of research is so unreliable that readers need to be alerted.” And she reminds us that the Committee on Publication Ethics (COPE) guidelines state: “Journal editors should consider retracting a publication if: they have clear evidence that the findings are unreliable, either as a result of misconduct (e.g. data fabrication) or honest error (e.g. miscalculation or experimental error).”

I’m guessing everyone agrees hands down that papers with significant data fabrication should be retracted. As for cases of experimental error, the line seems to be harder to draw. As Barbour points out, the word “retraction” has a

very negative connotation among scientists. For many, it's considered a severe reprimand and a suggestion that the paper and its findings should be completely ignored (not listed on the CV, cited, built off of, etc.). But as hard as scientists try to control for every variable, experimental mistakes are unavoidable. Should papers containing data that were collected in good faith but which unknowingly contained errors be retracted? What if there are still findings in the paper that are absolutely true—like the discovery of a new virus as is the case in this study? Perhaps a correction would be more appropriate in this case. Or, even better, maybe we need to take a more nuanced approach. In this digital age, it makes perfect sense for scientific articles to be “living documents” that contain clarifications when needed or that link to papers or letters to the editor that show a finding is under dispute. Such documentation should be clear and unavoidable when downloading an article or viewing it on the web—so even a naïve reader is able to tell that there are potential problems. Additionally, journals need to disseminate this information to readers who have already downloaded the paper—and many do by publishing corrections and errata in the table of contents of the journal once mistakes are noticed (although this practice is far from perfect).

I'm glad that Barbour clarified her stance on whether papers with incorrect *conclusions* should be retracted. Conclusions are much slipperier fish than are data. The very nature of scientific advancement depends on this: scientists seek to improve, refine, and often reject previous conclusions as they search for the truth. No one should be penalized for putting forth a theory that is later proven wrong.

Related Links:

- A recent NPR story saying about the [reason behind most retractions](#)