When Scholarly Publishing Goes Awry: Educating Ourselves and Our Patrons about Retracted Articles

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abstract: Retracted articles, articles that violate professional ethics, are an unsettling, yet integral, part of the scholarly publishing process seldom discussed in the academy. Unfortunately, article retractions continue to rise across all disciplines. Although academic librarians consistently provide instruction on scholarly publishing, little has been written about their role in educating patrons about retracted article. This article provides an overview of the article retraction process. Search strategies for locating retracted articles in several scholarly databases are discussed. Suggestions on how to incorporate article retractions into information literacy instruction are provided, including connections to the Association of College and Research Libraries Framework for Information Literacy for Higher Education.

Introduction

In the academy, there is a heightened awareness of the fallibility of scholarly research and publishing. This awareness is exemplified by the “reproducibility crisis”: researchers have become increasingly cognizant that many published research studies cannot be successfully duplicated. For example, only a reported 10 to 25 percent of cancer biology studies can be reproduced. (Being unable to reproduce published results does not necessarily indicate that the authors committed malfeasance or that the article’s results are incorrect. Rather, it only indicates that another researcher was unable to replicate the published work.) The lack of reproducibility of scholarly research has led to calls for more transparency in research and publication practices. While the scholarly publishing process, including peer review, is intended to set rigorous standards and expectations for publications, it is not infallible. Even after rigorous editorial and peer

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When Scholarly Publishing Goes Awry

When scholarly publishing goes awry, some articles are found after publication to have violated professional ethics. Retractions are the means that scholarly publishers and journals use to notify readers that a publication has been found to violate professional ethics and, therefore, should not be considered a trustworthy source.

Unfortunately, the number of retracted articles continues to rise across all disciplines. Researchers postulate that more retractions could be caused by an increase in flawed articles due to academic misconduct or, conversely, an increase in the detection of flawed articles due to technological advances such as plagiarism detection tools. One team of researchers estimates that there has been a “10-fold increase in retractions for scientific fraud (e.g., data fabrication or falsification) since 1975.” The retraction of several high-profile articles, such as the 1998 article in the *Lancet* linking a vaccine to an increased prevalence of autism in children, and examples of serial offenders such as Joachim Boldt in anesthesiology and Robert Slutsky in radiology, have raised awareness of the fallibility of scholarly publishing among librarians as well as the general public.

While the medical library literature has called for medical librarians to become more involved in educating patrons about article retractions, all academic librarians who assist patrons in locating and using scholarly publications should be knowledgeable in this area to teach novice researchers about the complete scholarly publishing process and to assist experienced researchers in identifying critical scholarship. The goal of this article is to provide academic librarians an introduction to the article retraction process and to share both practical tips and search strategies for locating retracted articles in scholarly databases. Additionally, it will recommend how to incorporate retraction into information literacy (IL) instruction, including connections to the Association of College and Research Libraries (ACRL) Framework for Information Literacy for Higher Education.

**Retracted Articles in the Academy**

While many retracted articles originate in the science, technology, engineering, and mathematics (STEM) disciplines, the social sciences and humanities are not immune to retractions. The psychology world was shocked to learn that Diederik Stapel, a prominent Dutch social psychologist, fabricated many of his published results, ultimately resulting in the retraction of over 50 publications. In the humanities, Mustapha Marrouchi, a former English literature professor at the University of Nevada, Las Vegas, was found to have plagiarized from over a dozen authors in 23 articles. Marrouchi was subsequently fired, and these articles were retracted.

It is important for academic librarians to be knowledgeable about retracted articles for several reasons. First, the scholarly publishing process is often taught during IL instruction, but what happens to an article after publication (such as a retraction) is often neglected (see Figure 1). We do our students a disservice if we teach that the scholarly publishing process ends with the publication of an article.

Second, students are often instructed to only use scholarly, peer-reviewed articles for assignments. These sources are considered trustworthy and authoritative due to the rigorous standards and expectations of scholarly publishing, unlike non-peer-reviewed sources. These assignment constraints leave students with the understanding that scholarly sources should not be questioned and are infallible, when, in fact, scholarly publishing
can be a flawed process and students need to examine all sources through a critical lens. By teaching students about retracted articles, we help them to become critical consumers of information, to develop an understanding about the value of information, and to grasp the nature of authority in scholarship.

Third, due to the proliferation of online databases, searching for retracted articles has become much easier. Unlike in print resources, article records in online databases can be easily changed to reflect that the article has been retracted. Retraction notices can be added to the database and these two documents linked together. All subsequent readers will see that a particular article has been retracted.

**Literature Review**

Eugene Garfield, a pioneer in citation indexing and founder of the Institute for Scientific Information (ISI), said that retractions are a necessary part of the scholarly publishing process and the scientific community has an obligation to police its publications.\(^\text{12}\) Garfield’s thoughts can naturally be extended to the social sciences and humanities as well, because retractions are the means that researchers use to self-correct the literature.
Scholars have studied retracted articles for many years. Fortunately, one study found that retractions of biomedical articles were twice as likely due to honest errors as to misconduct by the authors and that article corrections were seven times more common than article retractions. However, authors with articles retracted due to misconduct will more likely reoffend than authors with articles retracted due to honest errors. Interestingly, no difference has been found in the retraction rate of open access articles compared to fee-for-access articles.

In a study of approximately 150 high-impact science journals, 65 percent of these journals had formal retraction policies. Of the journals with retraction policies, 94 percent of these policies allow the editor to retract an article without the author’s consent. Some journals that only publish review articles say that they do not have retraction policies because reviews do not contain original research and would not have issues of scientific misconduct, neglecting the possibility of plagiarism.

Many people assume that journals with high impact factors (such as Science and Nature) have fewer article retractions because articles published in these journals undergo highly rigorous editorial and peer review. However, these journals actually have higher retraction rates. These higher rates could be caused by the articles themselves receiving more scrutiny by the academic community or because the incentive to violate a professional code of ethics is much higher to achieve publication in these journals.

Retractions in Scholarly Disciplines

Article Retractions in Practice

Article retractions occur when the author requests that the article be retracted or the journal editor finds evidence that the article violates professional codes of ethics. These violations can include honest errors, fabrication or unethical manipulation of data, poor data management (such as an author unable to produce raw data to support published results), unethical research practices (such as lack of informed consent), plagiarism (including self-plagiarism), redundant publication, or undisclosed conflicts of interest. Some articles are retracted because they have multiple types of violations. The evidence supporting a retraction can come from an investigation conducted by the journal, by the author’s institution, or by the Office of Research Integrity, the office in the federal government that handles allegations of research misconduct.

After deciding to retract an article, the journal releases a retraction notice. The notice is a statement explaining why the article is being retracted and should provide the full citation of the retracted article. It should clearly state the reason for the retraction, who is retracting the article (the author, the author’s institution, or the editor), and whether the author agrees with this decision. If applicable, the notice should also state which author (or authors) is responsible for the ethics violation. In the case of social psychologist Diederik Stapel, his collaborators were unaware of his data fabrication. Consequently, the retraction notices name Stapel as the sole responsible author. For an example, see Diederik A. Stapel and Camille S. Johnson, “When Nothing Compares to Me: How Defensive Motivations and Similarity Shape Social Comparison Effects,” European Journal of Social Psychology 37, 5 (2007): 824–38.
The retraction notice should be published in all formats of the journal (for example, print, microfilm, and electronic versions). As a best practice, a retraction notice should be released as soon as possible to prevent other researchers from citing the retracted article or acting on its findings. However, the Committee on Publication Ethics (COPE), a nonprofit organization of editors and publishers who work to promote best practices in scholarly publishing, suggests that editors delay releasing a retraction notice until the results of an institutional or governmental investigation are known (if one is being conducted). However, they should not delay or stop a retraction if the authors are uncooperative (that is, do not agree with the retraction) or threaten legal action.23

Journals can issue other types of notices besides retractions. Editors can issue an expression of concern indicating an unconfirmed suspicion that the article violates professional ethics when an investigation has not yet concluded.24 Corrections can also be issued; in such notices, the journal editors should “correct a mistake by substituting correct information or by asking the reader to disregard specified parts of an article (for example, a reference to a retracted article).”25 Corrections can also report changes to the author list.26 A journal issues an erratum when a production error occurs, such as an author’s name being misspelled.27 A journal can also remove an article due to a legal action. In this case, the full text of the article will be eliminated and replaced with a notice indicating its removal.28

Retraction Guidelines

While COPE provides extensive guidelines on how editors should handle retractions, publishers and journals often implement their own policies. For example, some journals may retract an article due to an authorship issue, while COPE suggests issuing a correction. Also, each publisher has a unique process for denoting retractions. In Figures 2 and 3, the Journal of the American Chemical Society has marked this article as withdrawn in the article record but did not add the “Retracted” watermark to the full text of the article. For further information on retraction policies, see the policies on the publisher’s websites.29 Note that each publisher names its retraction policy slightly differently, but they include much the same information.

Not all articles that should be retracted actually are. Authors who disagree with a retraction can threaten the journal editor or publisher with legal action.30 In these situations, the COPE guidelines suggest that the editor should still retract the article, after seeking legal advice to ensure that the retraction notice is not defamatory or libelous.31 Additionally, the author’s institution or the Office of Research Integrity may fail to investigate for a variety of reasons. Without evidence from these investigations, the editor may lack conclusive proof to support a retraction. Even if an institution finds that an article violates professional ethics, the journal publisher or editor may not retract it due to fear of legal action or other forms of retribution.
When Scholarly Publishing Goes Awry

Older articles will more likely be retracted. The average time to retraction was 23.8 months. Recent articles may represent the latest research in a discipline, but they may not have had sufficient time to “run the gauntlet,” unlike older articles.

Once an article has been retracted, authors and students should not cite it in other publications or class assignments. Studies show that, even once articles are retracted, other researchers continue to cite them in their own research. An exception to this rule is citing the retracted article as an example of scientific misconduct or error. For example, a researcher should not refer to Stapel’s work in a publication on psychology research, but he or she could mention Stapel’s retracted articles as examples of research misconduct. In cases where an expression of concern has been published, a subject expert should be consulted to determine whether the article can be trusted.

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Ramifications for Library Collections

The retraction notice and the retracted article are not the same document. See Figures 2, 3, and 4 for an example of a retraction notice, the record of a retracted article, and the full text of a retracted article, respectively. The retraction notice is usually a single paragraph explaining the reason for retraction, whereas the record of a retracted article or the full text of the article has the retraction noted (such as a header or watermark). In their electronic forms, the notice of retraction and the retracted article should be linked; this connection makes it straightforward for readers to locate one after they have found the other.

Librarians may be tempted to remove retracted articles from their collections. Nevertheless, in keeping with the American Library Association Code of Ethics, we must ensure freedom to access all information.

Searching for Retracted Articles

COPE’s Retraction Guidelines call for retractions to be “labelled in such a way that they are identified by bibliographic databases.” This guideline means that, in addition to releasing a retraction notice, the journal should mark the retracted article in such a way that databases can identify it as such. Once the database has identified the article as retracted, it is relatively easy to search for it.
Retraction of “Mechanical Reconfiguration of Stereoisomers”

Kelly M. Wiggins, Todd W. Hudnall, Qilong Shen, Matthew J. Kryger, Jeffrey S. Moore, and Christopher W. Bielawski

J. Am. Chem. Soc. 2010, 132, 3256–3257. DOI: 10.1021/ja910716s

Based on an investigation conducted by The Office of Research Integrity at The University of Texas at Austin, it was determined that the data and scientific conclusions of this article are unreliable as a result of scientific misconduct by one of the co-authors affiliated with the University at the time of its publication. The authors retract this article accordingly.

The original paper was published February 18, 2010 (J. Am. Chem. Soc. 2010, 132, 3256–3257. DOI: 10.1021/ja910716s), and retracted March 11, 2015.

Figure 2. An example of a retraction notice on a scholarly journal’s website. Reprinted with permission from Kelly M. Wiggins, Todd W. Hudnall, Qilong Shen, Matthew J. Kryger, Jeffrey S. Moore, and Christopher W. Bielawski, “Retraction of ‘Mechanical Reconfiguration of Stereoisomers,’” Journal of the American Chemical Society 137, 9 (2015): 3428. ©2016 American Chemical Society.

Mechanical Reconfiguration of Stereoisomers

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DOI: 10.1021/ja910716s
Publication Date (Web): February 18, 2010
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Retracted
This paper was withdrawn on March 11, 2015 (J. Am. Chem. Soc. 2015, 137. DOI: 10.1021/jacs.5b01988).

Abstract

Poly(methyl acrylate) of varying molecular weight was grown from the enantiopure ditopic initiator ([R]- or ([S])-1,1’-binaphthyl-2,2’-bis-(2-bromoisobutyrate). Subjecting CH₂CN solutions of high-molecular-weight derivatives ($M_n > 25$ kDa) to sonication at $0 \, ^\circ$C resulted in >95% racemization after 24 h, as determined by circular dichroism; no appreciable racemization was observed in low-

Figure 3. An example of the article record of a retracted article on a scholarly journal’s website. To indicate that this article has been retracted, this journal says, “This paper was withdrawn.” Reprinted with permission from Kelly M. Wiggins, Todd W. Hudnall, Qilong Shen, Matthew J. Kryger, Jeffrey S. Moore, and Christopher W. Bielawski, “Mechanical Reconfiguration of Stereoisomers,” Journal of the American Chemical Society 132, 10 (2010): 3256–57. © 2016 American Chemical Society.
Figure 4. Example of the full text of a retracted article on a scholarly journal’s website. Note that the publisher has added a “Retracted” watermark. Reprinted with permission from Kelly M. Wiggins, Todd W. Hudnall, Qilong Shen, Matthew J. Kryger, Jeffrey S. Moore, and Christopher W. Bielawski, “Mechanical Reconfiguration of Stereoisomers,” Journal of the American Chemical Society 132, 10 (2010): 3256–57. © 2016 American Chemical Society.
This discussion of searching for retracted articles in scholarly databases is not meant to be an exhaustive list. Many other databases index retractions, including Scopus and CINAHL (Cumulative Index to Nursing and Allied Health Literature). Rather, this discussion is meant to demonstrate various search strategies. Each database indexes retracted articles and retraction notices differently. Finding these types of documents in a specific database will be a matter of trial and error until the right search terms, Advanced Search features, or both are found. However, librarians and researchers can try the following techniques to uncover retracted articles and retraction notices in a variety of disciplines.

PubMed is a comprehensive database of biomedical research including medicine and related disciplines. Retracted articles can be found by searching for two different publication types: retraction of publication (which searches for retraction notices) and retracted publication (which retrieves for the original publication that was retracted). Using the Basic Search function, use the search terms “retracted article” OR “retraction” to search for both retracted articles and retraction notices. On the search results page, use the Article Type filter (on the left toolbar) to restrict results to the two previously mentioned publication types. Another approach is to use the Advanced Search function in this database, select Publication Type from the dropdown menu (the default is All Fields), then click “Show Index List” on the right side of the search box, and select the desired publication type. Additionally, articles with suspected albeit unconfirmed cases of misconduct can be found in PubMed by searching for “expressions of concern”; these documents have “Expression of concern. [Article title]” as their title.

Unfortunately, PubMed Central does not offer searching by publication type. Instead, follow the same instructions using the Basic Search function in PubMed and apply the “Free full text” filter under Text Availability. After applying this filter, the search results will include retracted articles and retraction notices that are freely available in PubMed Central.

Web of Science has indexed article corrections since its inception in 1963. This database’s name is somewhat of a misnomer because its Core Collection includes publications in the social sciences and humanities as well as the sciences. To search for retractions, in the Basic Search feature, change the dropdown menu to Document Type (the default is Topic) and then select “correction” or “correction, addition.” Selecting these two options will include corrections, errata, and retractions in the search results. To search only for retractions, search for “retracted article” or “retraction of” in the Title. Note that searching for the latter search term will return results other than retraction notices. Web of Science indicates retraction notices and retracted articles with a note at the end of the title. For a retraction notice, “(Retraction of vol X, pg Y, year)” is appended to the article title. For the retracted article, “(Retracted article. See vol X, pg Y, year)” is added. To locate retractions within a specific discipline, add the discipline name to the search terms. For example, search for “retracted article” AND “psychology.”

JSTOR (Journal Storage) provides full-text access to journals, books, and primary sources in the sciences, social sciences, and humanities. Again, using “retracted,” “retracted article,” or “retraction” as search terms in the Basic Search feature will yield the desired results. The former search terms return retracted articles, while the latter returns retraction notices. Entering search terms into the Basic Search feature produces full-text searches. Using the Advanced Search feature, the search can be changed to a title search.
by changing the dropdown menu to “Item Title.” The Advanced Search feature also allows searching by specific disciplines or journals.

Finally, Google Scholar is another source that can be used to find retracted articles and retraction notices across a variety of disciplines. For retracted articles, the prefix “Retracted Article” is added to the article’s title. Searching for <allintitle: “retracted article”> returns over 1,000 results of retracted articles. Entering <allintitle: retraction> yields thousands of irrelevant results because the word retraction has many different meanings across the disciplines other than a retraction notice. Searching in Google Scholar can return an overwhelming number of search results, so it may be best to use this database for known item searching.

As mentioned earlier, articles can be retracted for a variety of reasons, such as plagiarism, duplicate publication, or unethical research. The retraction notice may tell the reader the reason for the retraction but usually will not provide the greater context for the retraction; some retraction notices give no reason at all. Often, searching an online search engine will lead to nonscholarly publications, such as newspaper articles and university publications, that provide much more detail and context about the retraction as well as the circumstances surrounding it. For example, in the case of Mustapha Marrouchi, the Chronicle of Higher Education wrote several pieces about his alleged plagiarism, the subsequent institutional investigation, and his eventual firing. Of course, searching the open Web for such information can lead to biased or incorrect information. Limiting search results to credible news sources should reduce the likelihood of using biased or untrustworthy information, but the reader must take a critical eye to any stories published on the open Web.

Another valuable tool for researching the background of an article retraction is the blog Retraction Watch (retractionwatch.com). Two editors of medical journals, Adam Marcus and Ivan Oransky, started this blog in 2010 because they believed that retractions are not often well publicized but offer a unique view into the scholarly publishing process. Additionally, they wanted to help to illuminate differences in retraction policies between different journals. A blog also facilitates dialogue, which was previously missing when examining article retractions. Currently, Retraction Watch tracks retractions across a variety of science, social science, and humanities disciplines. Not only does it post recent retractions but also it reports on allegations of misconduct (that could result in retractions) and institutional and governmental misconduct investigations. However, this source is not unbiased, so the reader must take a critical eye when using it.

Incorporating Retracted Articles into Instruction

While librarians consistently provide instruction on the scholarly publishing cycle, they seldom discuss retracted articles as part of this instruction. There are several approaches to incorporating retracted articles into IL instruction, and this addition can help learners to fulfill three of the ACRL Framework concepts.
Retracted articles can naturally be incorporated into instruction sessions on the scholarly publishing process. This topic is robust enough to warrant dedicated instruction sessions. The amount and type of information discussed about the retraction process in these sessions will vary depending on the audience and the length of the session. Faculty may be more focused on depth, such as how specific journals or publishers handle retractions, while an undergraduate audience may be more interested in the breadth of the retraction process, such as how retractions affect all disciplines.

Instruction in this area models the Authority Is Constructed and Contextual and Scholarship as Conversation frames in the ACRL Framework. The Authority Is Constructed and Contextual frame says that experts “view authority with an attitude of informed skepticism.” One knowledge practice of this frame is that learners “use research tools and indicators of authority to determine the credibility of sources, understanding the elements that might temper this credibility,” and a disposition is that learners “develop awareness of the importance of assessing content with a skeptical stance.” An understanding of retracted articles will help learners to become skeptical consumers of scholarly, peer-reviewed publications. In the Scholarship as Conversation concept, experts “understand that a given issue may be characterized by several competing perspectives as part of an ongoing conversation in which information users and creators come together and negotiate meaning.” A disposition of this concept is that learners “recognize they are often entering into an ongoing scholarly conversation and not a finished conversation.”

Often, learners get the impression that scholarly literature is infallible, whereas introducing them to retracted articles helps them to realize that they are participants in the scholarly publishing process, not merely bystanders. Showing that scholarly articles are indeed fallible gives learners a reason to “talk back to the text.”

Retracted articles can also be incorporated naturally into plagiarism discussions. These articles help students to understand plagiarism not as an abstract concept but as a real-world issue with significant consequences. One impactful way to present plagiarism in a retracted article is to show the retracted article and the original source side-by-side with the plagiarized text highlighted in both. Every discipline has examples in which scholars were caught plagiarizing (such as Mustapha Marrouchi in English literature). Retracted articles can also be used to start a discussion about self-plagiarism. Incorporating retracted articles into plagiarism discussions helps learners to fulfill the Information Has Value concept by developing the knowledge practice of giving “credit to the original ideas of others through proper attribution and citation” and by cultivating the disposition of respect for others’ ideas. Additionally, librarians are usually only part of research ethics education on plagiarism. Discussing retracted articles could be an avenue to expand the library’s role in the area of research ethics.
Instruction on retracted articles can also be incorporated into data information literacy education. Data are now considered a key part of the scholarly record. Data information literacy education seeks to help patrons become more efficient and effective managers of their research data. Poor data management practices, such as inability to produce the raw data files that support published results, can result in an article being retracted. Librarians can incorporate retracted articles in data information literacy education as a real-world example of the negative effects of poor data management practices. While these examples are not meant to scare or threaten researchers, they are an ideal example of how robust data management practices are as vital to their research as the scientific method.

Considerations in Teaching about Article Retractions

The most obvious target audience for instruction on retracted articles is graduate students and faculty because they are deeply invested in the scholarly publishing process within their discipline. For example, graduate students and faculty may want to know if any articles they have cited in their own publications have been retracted. Many will be actively conducting research and publishing their own articles, which will give them a deeper understanding of the scholarly publishing process.

Undergraduates will also benefit from incorporating retracted articles into their IL instruction, especially those who conduct research. They will need more context about scholarly publishing during instruction than graduate students or faculty. For example, with graduate students, a brief overview of the scholarly publishing process (such as Figure 1) should be sufficient background to start a discussion about retracted articles. For undergraduate students, they will need more detail about each step of the process before discussing retracted articles.

In adding retracted articles to IL instruction, there is a need to strike a balance between fearmongering and dismissal. While we do not want to dismiss article retractions as an insignificant part of the scholarly publishing process, we should try to avoid making patrons doubt the overall integrity of this process. It is important to remember that a very small number of articles are retracted every year. In a study of articles published in PubMed between 1950 and 2004, only 596 or 0.006 percent were retracted. When teaching article retractions, we do not want to give the impression that scholarly publishing is inherently corrupt or negligent. Instead, we should work to instill a healthy dose of skepticism in our learners.
When discussing retracted articles, it is important to bear in mind that most library users, even faculty, will not have encountered them before. Therefore, providing them with actual examples of retracted articles and retraction notices, preferably examples within their discipline, will be helpful. Provide patrons with several examples and let them analyze the retracted articles and retraction notices. Then show them how to search a scholarly database for these types of documents. Next, show them how to interpret a retraction notice, which is like teaching them how to interpret an article record.

Demonstrating how to search for retracted articles in a scholarly database provides a natural segue into an active learning exercise in which learners explore a retracted article independently. For a hands-on activity, allow learners to search for a retracted article in a scholarly database independently or in small groups. After cautioning them to be wary of biased sources, encourage them to search the open Web for more information about the retraction, author, institutional or governmental investigation, and the like. Finally, have them report back to the group about their chosen retraction: the journal name, article title and authors, why the article was retracted, who retracted it, and other information. This activity will help them to see the breadth of reasons for retractions and gain hands-on experience searching for retracted articles.

Conclusions

While much has been written in the scholarly literature in response to the increase in article retractions, these articles are written for researchers, neglecting the important role that librarians can contribute to this process. One article details the roles of various stakeholders (journal editors, authors, institutions, and government agencies) in the retraction process but fails to mention librarians.48

As librarians, becoming knowledgeable about the retraction process and how to find retracted articles will help us become more integrated into the research process by shedding light on an area of scholarly publishing that is seldom discussed. We can also incorporate retracted articles into our information literacy toolkits. In turn, we can help educate our users about the fallibility of scholarly publishing. We will help patrons become more information literate because instruction on retracted articles helps to fulfill the Authority Is Constructed and Contextual, Scholarship as Conversation, and Information Has Value frames. Furthermore, having librarians and researchers knowledgeable about retracted articles can benefit institutions more broadly. If academic librarians can increase scholars’ awareness of this topic, researchers may be less likely to cite retracted articles in their publications and grant proposals. Moreover, informed librarians and researchers can help address allegations of research misconduct at their institutions. Having a campus community that is both knowledgeable and informed about article retractions can benefit an institution’s scholarly conversations and contributions.
While much of the discussion about retracted articles is negative, we and our patrons can learn from these mistakes in meaningful, constructive ways. Discussing article retractions can be the catalyst for further discussions about plagiarism, scholarly communication practices, or data management. Academic librarians can use these articles as teachable moments to help our students, faculty, and staff become more critical consumers of scholarly information.

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Notes

2. Begley and Ellis, “Drug Development.”
5. Steen, Casadevall, and Fang, “Why Has the Number of Scientific Retractions Increased?”
7. Steen, Casadevall, and Fang, “Why Has the Number of Scientific Retractions Increased?”


15. Peterson, “Characteristics of Retracted Open Access Biomedical Literature.”


17. Ibid.


25. Ibid.


27. Ibid.


32. Steen, Casadevall, and Fang, “Why Has the Number of Scientific Retractions Increased?”


35. Ibid.
36. Ibid.
43. Ibid.
45. Ibid.