

Research Retraction and Its Communication

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INTRODUCTION

This article presents an overview of the growing literature on a phenomenon of great import to scientific research, namely research retraction and its communication. In the context of academic journal publishing, research retraction is a self-regulatory and self-corrective measure (Ranjan, 2018) taken post-publication to “obliterate, at times, works from the publication record” (Shema et al., 2019, p. 98) that are seriously flawed, present findings of questionable validity and, consequently, contaminate the scientific literature. Seen as an indicator of “pathologies in science” (Walsh et al., 2019, p. 444), retraction is “a shameful act for the scientific community, but a necessity to maintain the purity of science” (Sheth & Thaker, 2014, p. 93). It was characterized by Eugen Garfield, the creator of the Science Citation Index and the founder of the Institute of Scientific Information (now known as the Web of Science [WoS]), as a necessary means for the academic community to self-police (Atlas, 2004).

This article introduces how retraction as a mechanism of literature correction operates, reveals the prevalence and gravity of retracted and retractable publications, discusses the consequences of retraction for various stakeholders, presents various reasons for retraction, identifies contributing factors to the unsatisfactory handling of retractions, provides suggestions on how to handle retractions more effectively and efficiently, and recommends directions for future research on retraction. While the article addresses the phenomenon of retraction in general, the topic is highly relevant to the discipline of information science and technology for two reasons. First, the number of retractions in the discipline is alarmingly huge. As many as 3,229 publications in the field of computer science have been retracted as of August 2022, accounting for approximately 10% of the retractions archived by the Retraction Watch Retraction Database (RWDB). Over 39% of those retracted publications were indexed by the WoS Core Collection, accounting for over 13% of all the WoS-indexed retracted publications. Second, the effective and efficient handling of retractions to prevent the continued circulation of retracted publications in the scientific literature can be enhanced by the resources brought about by information science and technology. Such resources can be utilized to enable databases of scientific literature (e.g., WoS and PubMed) to index and annotate retracted publications and disseminate retraction notices more accurately and promptly, equip reference management applications (e.g., EndNote and Mendeley) with the capacity to automatically alert users to retracted publications, and develop better software for detecting plagiarism, image manipulation, and paper mill manuscripts. By presenting an up-to-date overview of research on retraction, this article aims to advance the scientific community’s understanding of research retraction and its

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communication. The solutions recommended herein for enhancing the effectiveness and efficiency of the retraction mechanism are expected to be of practical value for all retraction stakeholders.

BACKGROUND

According to the Committee on Publication Ethics (COPE), retraction is a mechanism of science “for correcting the literature and alerting readers to articles that contain such seriously flawed or erroneous content or data that their findings and conclusions cannot be relied upon”, and its main purpose is “to correct the literature and ensure its integrity” (COPE Council, 2019, p. 4). The process of retracting a publication tends to be complicated (COPE Council, 2020; Williams & Wager, 2013) and often involves the participation of various stakeholders, depending on the specific problems with the retracted publications (Ranjan, 2018). Based on the extent of their involvement in handling retractions, retraction stakeholders can be categorized into three groups, namely the inner group (i.e., authors of retracted publications, research performing organizations [authors’ home institutions], and journal authorities [publishers and journal editors]), the intermediate group (i.e., research funding agencies, victimised peer researchers, competing peer researchers, and interested peer researchers), and the outer group (i.e., mistreated research participants, consumers of retracted research findings, and social sponsors of retracted research) (Xu & Hu, 2022c).

The complexity of the retraction process is well reflected in the COPE flowcharts intended as a comprehensive guide for handling various violations of research and publication norms (COPE Council, 2020). A retraction involves at least two groups of stakeholders, namely journal authorities and authors of retracted publications. In some cases, other entities may also be involved, for example, research performing organizations, research funding organizations, interested readers of the retracted publications, and individuals and organizations whose legal interests are jeopardized by the retracted publications (Grieneisen & Zhang, 2012; Ranjan, 2018). Retractions tend to be initiated or requested by authors of retracted publications and/or journal authorities (COPE Council, 2019; Grieneisen & Zhang, 2012), and journal editors have the final say on a decision of retraction in most cases (Wager et al., 2009). Retractions may be triggered by interested readers or whistle-blowers who alert journal editors to suspected problems with publications (COPE Council, 2020; Xu & Hu, 2021).

The mechanism of retraction operates mainly through issuing publication-retracting documents in academic journals and/or on their official websites. Publication-retracting documents have been published under various names (e.g., *Correction*, *Erratum*, *Letter to the Editor*, *Publisher Note*, *Retracted Article*, *Retraction Note*, *Statement of Retraction*, *Withdrawal*, and *Withdrawal Notice*) but are labelled as *Retraction Notices* or *Retraction* in more and more journals and databases. MEDLINE started listing retractions as a unique publication type in 1980 (Wager & Williams, 2011). The U.S. National Library of Medicine (NLM) used to index a publication-retracting document as *Letter to the Editor* or *Editorial* (Kotzin & Schuyler, 1989) and then started indexing such documents as *Retraction Notices* in 2002 (NLM, 2002). Differently, WoS started categorizing publication-retracting documents under *Correction* or *Addition* (WoS, 2016) and then under *Retraction* as an independent publication type (WoS, 2018).

The authorship of retraction notices remains a neglected and disputed issue. It has not attracted sufficient scholarly attention, and some scholars (e.g., Bilbrey et al., 2014; Wager & Williams, 2011) appear to identify initiators or performers of retractions as retraction notice authors. However, using a set of authorship identification criteria based on a textual analysis, Xu and Hu (2018) have found that retraction notice authors can be different from the initiators and performers of retractions. Specifically, their

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