

The Rise of Predatory Publishing: How To Avoid Being Scammed

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The rise of on-line open access (OA) has profound implications for academic publishing, not least the shift from subscribers to authors as the primary transactional partners for peer-reviewed journals. Although OA offers many benefits, it also paves the way for predatory publishers, who exploit the author-as-customer model to obtain revenue from author fees while providing few of the editorial services associated with academic publishing. Predatory journals publish papers with little or no peer review, and often disguise their real geographical location while exaggerating their scope and editorial expertise. Such journals also attempt to attract authors by promising unrealistically rapid editorial decisions while falsely claiming peer review, and fabricating impact factors and inclusion in academic indexes. The explosive increase in predatory OA journals is not only a risk to inexperienced authors, but also threatens to undermine the OA model and the legitimate communication of research.

Key words: Open access, predatory journals

Academic journal publishing, for many years regarded as a peaceful scholarly haven, has over the past two decades experienced rapid change driven by the rise of on-line-only journals and the associated emergence of open access (OA). These innovations have revolutionized academic publishing, providing faster and broader access to published research across all scholarly disciplines. However, on-line OA also opened the door for predatory publishers, who fraudulently collect author fees for posting papers in hastily established on-line journals, while providing few, if any, editorial services. The lack of effective peer review in predatory journals threatens established standards of scientific communication, and potentially the legitimate conduct of scientific research. Inexperienced and unwary researchers especially risk career damage if they become victims of predatory publishers. This article describes characteristics of a predatory journal that should alert potential authors, and discusses the wider dangers of predatory publishing.

The Rise of Open Access and On-Line Journals.

Early experiments with open-access journals in the 1990s gave rise in the early 2000s to a new publishing model, where papers published on line were made available to anyone with an internet connection, and article processing charges paid by authors replaced the individual and institutional subscriptions that had traditionally been paid to receive print issues of journals (Björk 2011). Not all

journals published on line are open access, and different levels of OA exist. In “gold” OA, the author pays an article processing charge that can be as much as several thousand dollars, in return for retaining copyright and for the published article to be made freely accessible on line and available for redistribution by anyone in perpetuity. “Green” open access restricts free distribution, but allows authors to make articles available on their own web pages or through a third-party repository. Variations on OA models have emerged; for example, some journals place new content behind a pay wall, but make older content freely available. Many scholarly journals—including those owned by WSSA—use a hybrid OA publishing model, where only subscribers have unlimited access to journal content, but an author can choose to pay an additional fee and make an individual article available to all via gold OA.

The rise of on-line OA journals is changing the expectations of those who use peer-reviewed scientific literature, and how they access it. Printed and bound paper journals that have to be physically distributed, catalogued, and stored in library stacks or on dusty office shelves are becoming part of the past. An increasing number of government agencies and universities in the United States and elsewhere actively encourage OA publishing, and may require that researchers receiving funding should publish OA as matter of principle, arguing that if research was publicly funded, the results should be freely available to the public (Adler 2015; Howard 2012). Authors question why they should pay to have their papers published on line when they are already essentially providing free content to the publisher

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(Kendzior 2013). Amid this upheaval and change it is easy to lose sight of some key facts.

First, scholarly journals, including those published by professional societies and other nonprofit organizations, must generate sufficient revenue to cover production costs. Discontinuing hard copy eliminates the expense of printing, binding, warehousing, and shipping journal issues. However, other production costs remain unchanged for on-line-only journals, including maintenance of journal web sites and associated software for on-line manuscript submission and review tracking, editorial management, copyediting and page composition, on-line posting of articles, distributing content alerts for new issues and other journal promotion activities, and digital archiving of back issues. For scholarly journal publishers, the main sources of revenue to cover these costs are subscriptions, either individual or institutional (e.g., university libraries); licensing of journal content to third-party digital repositories such as BioOne or JSTOR; and page charges or other publication fees paid by authors.

Second, an important—and often overlooked—consequence of adopting the gold OA model is that authors replace readers as a journal's primary customers. Under the traditional subscription and pay-wall model, quality of journal content is a key selling point for institutional and individual subscribers. If the content is substandard nobody will pay to read it, and editors and reviewers therefore serve as important gatekeepers to ensure that published papers communicate good research. With the shift to OA, authors—not subscribers—become the primary transactional partners paying for publishing services such as editing, on-line posting, archiving, and advertising (Shen and Bjork 2015). Once gold OA papers are published, readers have access to current and archived journal content for free, so journal revenue must come from author payments prior to publication. This imposes pressure on OA journals to provide services that will attract authors, such as fast-tracked editorial decisions, wide dissemination of published papers, and a high journal impact factor. The risk is that under the OA model, maintaining rigorous peer review and ensuring quality of published manuscripts could become secondary to providing customer satisfaction to authors. For many academic authors and the journals in which they publish, OA presents no such contradiction: good researchers want their work published in highly visible, quality journals, and good OA journals maintain the rigorous editorial standards expected by their

customer base. Unfortunately, the on-line OA model can also be exploited by journals where business practices and standards of peer review are questionable at best.

Open Access and the “Author as Customer” Model Pave the Way for Predatory Publishers.

The advent of on-line publication made OA possible and opened the door for a spectrum of on-line-only OA publishers new to the scholarly journal scene. These include nonprofits such as Public Library of Science (publisher of the PLoS open access journals) and others working to expand OA while maintaining editorial standards and quality peer review. However, on-line OA also means that unscrupulous publishers looking for a revenue source no longer need to develop a subscriber base or physically produce a printed journal. Instead, all that is required to make money is a web site, an e-mail address, a journal name, and authors willing to pay for publication of their papers; software for OA on-line journal management is even available for free (Public Knowledge Project 2014). The phenomenon of OA journals that conduct little or no peer review, and are primarily money-making ventures collecting author fees for rapid on-line publication of submitted papers, has been termed “predatory publishing” (Beall 2012). Such journals pose a risk for inexperienced authors, especially young researchers under pressure to publish to further their careers, who are attracted by promises of rapid manuscript acceptance and OA publication. The number of such journals has exploded. Jeffrey Beall, professor and academic librarian at the University of Colorado Denver, maintains an on-line list of publishers he considers possibly or probably predatory; in January 2016 Beall's list contained 923 such publishers, up from 18 in 2011 (Beall 2016a). Predatory “pay-for-play” publishers range from substandard to fraudulent, taking payments from inexperienced, gullible, or unscrupulous authors while providing few or none of the expected publishing services such as expert peer review and editorial feedback, copyediting and page composition, or archiving; some do little more than upload raw manuscript files to a journal web site. It is also common to see predatory publishers launch multiple new on-line journals simultaneously, spreading the net as widely as possible to lure fee-paying authors (Beall 2012; Gutierrez et al. 2015; Shen and Bjork 2015).

Why Should We Worry About Predatory Publishing? The greatest concern is that predatory journals undermine an essential component of the scientific enterprise by falsely claiming that the papers they publish are peer reviewed. As any researcher can attest, the peer-review process is not always perfect even when undertaken with good intent by high-quality journals. However, subjecting papers to the scrutiny of expert peer reviewers as a condition of publication remains the universally accepted standard for communicating scientific research, and the best system we have for filtering good science from bad (Spier 2002). Effective peer review takes time, and one of the easiest ways to identify a predatory journal is the promise of unrealistically rapid manuscript acceptance, as described below. Many predatory journals have abandoned any pretense of review despite their claims to the contrary, as has been revealed by more than one instance of a journal accepting a completely bogus paper submitted as a deliberate sting (for some entertaining examples, see Bohannon 2013; Safi 2014; Van Noorden 2014). Arguably, this loss of peer review harms more than the integrity of the scientific enterprise by publishing faulty research that would not survive peer review in a legitimate journal. Authors also lose the opportunity to improve their papers in response to the comments of their expert peers.

An additional concern is that some authors are using predatory journals to circumvent peer review and publish “advocacy research” advancing a personal agenda (Miller and Wager 2016). One well-publicized example is Gilles-Éric Séralini, the French researcher notorious for a retracted (and subsequently republished) study linking GM corn to cancer in rats (Casassus 2014). Séralini has also published papers claiming that glyphosate exposure causes birth defects in humans (Mesnage et al. 2012), and that Bt corn is toxic to livestock (Séralini 2016). Both these papers appeared in journals owned by publishers listed by Beall as predatory (Beall 2016a), and Séralini has been criticized for avoiding real peer review by using low-grade or predatory OA journals as outlets for agenda-driven papers reporting poorly designed experiments or mere anecdotes (Genetic Literacy Project 2014; Giddings 2014). Unfortunately, the general public, many journalists, and at least some of the research community do not distinguish between legitimate and predatory journals, allowing authors to present activist articles in predatory journals to a broad audience as “published research.”

Direct competition from predatory publishers is not the only problem faced by legitimate scholarly journals. More insidious recent developments include counterfeiting and hijacking. Counterfeiting involves a predatory publisher launching a journal with a name that closely mimics that of an established journal; this may be accompanied by a journal web site that copies the logo, typeface, and layout of the legitimate journal. A recent count identified 88 predatory journals that appeared to be deliberately imitating established journals (Bohannon 2015). For example, *The Journal of Agricultural Science*, published by Cambridge University Press since 1906, has at least two imitators: *Journal of Agricultural Science*, published by the Canadian Center of Science and Education (CCSE), and *MAYFEB Journal of Agricultural Science*, published by MAYFEB Technology Development. CCSE and MAYFEB are both based in Canada and listed by Beall (2016a) as predatory publishers. In such cases, an unwary reader may not notice inclusion of a paper from the imitator journal in the publications list of an unscrupulous researcher. The situation is further complicated by slight changes in journal names that make it difficult for the publisher of the original journal to take legal action, and fact that in many countries, including the United Kingdom and the United States, short phrases such as journal names or titles cannot be copyrighted (U.K. Copyright Service 2015; U.S. Copyright Office 2015). *Journal of Natural Products*, published by the American Chemical Society since 1936, has an imitator that did not even change the name: a counterfeit OA *Journal of Natural Products* is published in India, apparently as a one-man operation (Beall 2016b). The web site for the India-based *Journal of Natural Products* (<http://journalofnaturalproducts.com>) as of May 2016 included the statement: “This is not related or resembled in any way with already publishing monthly journal ‘journal of natural products’ by ‘american chemical society’” (sic). However, as with the previous examples, how many people—including potential employers—who see a *Journal of Natural Products* paper in a researcher’s publication list would not assume this to be the American Chemical Society journal?

Hijacking takes the deception of potential authors a step further by creating a spoofed web site at a URL that closely resembles that of a legitimate journal (e.g., weed.org instead of weeds.org). Hackers have also been reported running searches in databases such as Thompson Reuters for journal

domain names about to expire, and then moving to buy and register them before the legitimate publisher pays the annual web domain re-registration fee (Bohannon 2015; Dadkhah 2015). The intent is to drive traffic to spoofed or hijacked journal sites and lure authors into submitting papers and paying OA processing charges. Hijacking is on the increase: Beall (2016b) listed 105 hijacked scholarly journal sites as of April 2016. Researchers who suspect that a journal web site has been hijacked can use the Whois database (<http://whois.domaintools.com>) to find out who owns a URL, the IP location, and the date a domain was created. This date should correspond to the years during which the journal has published on line, and an IP location in a country other than where the journal editorial office claims to be based warrants further investigation.

In a recent study of journals classified as predatory, Shen and Bjork (2015) identified the greatest proportions of publishers (27.1%) and authors (34.7%) based in India; the rest of Asia accounted for 11.6% of publishers and 25.6% of authors, and 5.5% of publishers and 16.4% of authors were based in Africa. Shen and Bjork acknowledge that predatory journals cater to researchers in countries with limited resources who are unable to publish in established international journals, but also reported that 26.3% of predatory publishers and 18.0% of authors in their survey were based in Europe or North America. Shen and Bjork suggest that many papers published by predatory journals were submitted deliberately and with knowledge of the possible consequences by researchers calculating that their publication record will evade close scrutiny. Given the explosive growth in the predatory publishing industry, more information is needed on who publishes in these journals and why.

How To Identify a Predatory Journal. The estimated 8,000 predatory journals currently operating (McCook 2015) occupy an extensive spectrum from obviously amateur to slickly professional, and the publishers producing them range from opportunist one-person operations to established businesses. Some of the recently emerged for-profit OA publishers deny using predatory practices, and assert that their journals maintain high scholastic standards while providing needed publishing services for scientists in developing countries (see, for example, the controversies over the Cairo-based Hindawi and Hyderabad-based OMICS publishing groups described by Beall 2016c; Butler 2013; Kolata 2013,

and others). Prospective authors must ultimately decide for themselves whether an unfamiliar OA journal is legitimate and of sufficient quality to be trusted with a manuscript submission. A useful first step is to find out whether the publisher belongs to the Open Access Scholarly Publishers Association (<http://oaspa.org>), and whether the journal is listed in the Directory of Open Access Journals (<http://doaj.org>), which has taken stronger recent action to filter out predatory publications (Anderson 2014; Van Noorden 2014). In addition, any or all of the predatory journal characteristics described below should raise concerns.

1. Extensive and unselective spamming. Legitimate journals rarely if ever solicit manuscript submissions via mass e-mail. If you receive an excessively flattering, ungrammatical, and poorly worded e-mail invitation to submit to a journal—especially one outside your field of expertise—it is likely to be predatory. Look also for fabricated generic names of editorial or administrative “assistants” attached to requests for papers, and for journal editors’ e-mail addresses using free web-based accounts such as gmail or hotmail rather than a university or other institutional address.
2. Spurious international claims and excessively broad journal scope. Many predatory journals are trawling for papers on almost anything, as reflected in a long list of acceptable topics or an unrealistically broad or vague description of the journal scope. This is often accompanied by a grandiose journal name attempting to suggest a global audience, for example, “European Journal of...” or “American International Journal of...” Predatory publishers often claim to have “editorial” or “international” offices in Europe or North America when they are really based elsewhere.
3. Lack of a verifiable editorial office location or direct contact information. Be suspicious if the journal web site lists an unconvincing editorial office address. Google Streetview (<https://www.google.com/maps/streetview/>) is a useful tool here: many predatory publisher “editorial offices” when viewed on line are revealed to be private houses, apartments, or commercial business centers offering mailbox services. Authors should also be suspicious if the “Contact” tab on a publisher’s web site merely opens a generic web form to fill out, especially if personal or financial information is requested. The web

site of any legitimate academic publisher should include a complete and verifiable office address, together with phone and e-mail contact information.

4. Fabricated impact factors and false indexing claims. Predatory publishers frequently claim that their journals are “indexed” in various on-line databases. This tactic exploits a prospective author’s assumption that inclusion in such databases is limited to legitimate scholarly journals that meet screening criteria for quality. However, many of the databases listed by predatory journals are not true abstract and indexing services; they are nonselective directories, such as Cabell’s International (www.cabells.com), which lists journal topics, contact information and whether the journal states that it conducts peer review, or Ulrich’s Periodicals Directory (www.ulrichsweb.com), which provides librarians with lists of serial publications including academic journals, magazines, and newspapers. Google Scholar automatically indexes any on-line content and makes no distinction between predatory and legitimate OA journals (Gutierrez et al. 2015), so inclusion in this database is not an indicator of journal quality. The proliferation of predatory publishers is creating problems for genuine abstracting and indexing services such as EBSCO (whose products include Scopus) and CABI, both of which have been criticized for including low-quality journals to increase their database size as a selling point when competing for customers (Beall 2013). The ultimate goal of many scholarly journals is inclusion in the Thomson Reuters Web of Science Core Collection, which encompasses citation indices in sciences, social sciences, and arts and humanities, with established and rigorous criteria for journal listing (Testa 2016). The on-line Web of Science citation indexing service familiar to many researchers includes the Core Collection as well as other Thomson Reuters databases (Yong-Hak 2013). Inclusion in Web of Science provides a journal with several metrics through Thompson Reuters Journal Citation Reports, including the impact factor based on the average number of citations received by each paper published in the journal over a 2-yr period (Anonymous 2016). Impact factor is frequently used as a measure of a journal’s ranking, so it is not surprising that predatory publishers declare spurious impact factors for their journals. If a journal is not listed

in the Web of Science database (<http://ip-science.thomsonreuters.com/mjl/>) any impact factor claimed on the journal web site is most likely fabricated. Interestingly, a cottage industry of companies offering to sell or license impact factors to predatory journals has emerged (Beall 2015; Gutierrez et al. 2015). “Impact Factor Services for International Journals,” for example, based in Maharashtra, India, will provide an “impact factor” for US\$40 a year (<http://ifsij.com>). When evaluating a journal, therefore, prospective authors should check the source of any impact factor or other metrics claimed.

5. Limited or nonexistent archive of previously published articles. Many predatory journals claiming to be “established” or “leading in the field” in reality have little or no publishing history. Prospective authors should check to see whether back issues exist and are accessible on line. Journal runs starting with high numbers to inflate a nonexistent publishing history, previous issues containing few papers, or issues padded with multiple papers from the same or a limited number of authors—especially if these include the editor or editorial board members—should all raise warning flags. Papers posted on line as final publications (not First View or Early View articles) with pages that have not been professionally composed or copyedited should also alert suspicion. As with any unfamiliar journal, potential authors should read previously published papers to assess their scope and quality before deciding to submit a manuscript.
6. Unknown or unqualified editorial board members. The editor-in-chief, editorial board members, and their professional affiliations should be listed on the journal web site. Be wary of incomplete or fabricated editorial boards, and editors or associate editors with inadequate qualifications or expertise. A quick on-line search to establish an editor’s research record or confirm his or her institutional affiliation can be very informative. Researchers who are well known in their fields have been listed without their knowledge as editorial board members of predatory journals; prospective authors who have doubts can contact the individual concerned and ask if they have agreed to serve and what their experience of the journal has been. Association with a predatory journal does not enhance a professional reputation, so flattering e-mail solicitations to join the editorial board or be a guest editor for any unfamiliar journal should be

treated with suspicion. Researchers should verify the status of the journal before agreeing to serve on any editorial board.

7. Promises of rapid manuscript acceptance combined with claims of peer review. As already described, rigorous and thorough review by peers with appropriate expertise takes time, typically a minimum of 4–6 wk from manuscript submission to first decision even for high-profile journals with fast turnaround. Editorial decisions promised within a shorter time frame, especially claims of manuscript acceptance within a few days, almost certainly mean that no real peer review is being conducted. Authors should also be wary of invitations to submit papers to journal “special issues” with short timelines, such as a manuscript submission deadline within a couple of weeks and a publication date only a month later. Genuine special issues take many months to assemble.
8. Lack of transparency about author fees. All article processing charges or other author fees should be clearly stated on the journal web site, and payable only if and when a manuscript is accepted. Demand for payment when a manuscript is submitted indicates a predatory publisher, and requests for transfer of funds to an unverifiable bank account should also raise suspicion.

Why You Should Avoid Predatory Publishers. As already described, lack of peer review and low editorial standards in journals where the priority is obtaining author fees rather than communicating good science threatens the OA publishing model and the conduct and communication of research across all disciplines. Predatory journals pose additional risks for inexperienced authors, especially young researchers under pressure to publish to further their careers, who may be attracted by promises of rapid manuscript acceptance and OA publication. Researchers publishing in predatory journals face several negative consequences in addition to potential damage to their professional reputations and careers. Additional fees may be demanded after acceptance of the paper; published papers may not be archived or accessible through established searchable databases or search engines; and journal web sites may simply vanish and the publishers disappear, taking the papers and assigned copyrights with them (Stone and Rossiter 2015). Predatory publishers also frequently require copyright transfer as a condition of manuscript submission, making it

difficult for an author having second thoughts to withdraw a paper and submit it elsewhere (Beall 2012).

Inadequate peer review and questionable editorial standards are not novel phenomena, nor are they unique to OA journals. However, the shift to the author as paying customer business model means that OA is changing scholarly publishing in more ways than may be immediately apparent. Researchers considering submitting a paper to a new or unfamiliar OA journal should first investigate it carefully, and readers should pay attention to the sources of papers cited as “published research.” Authors should avoid supporting predatory journals by citing papers published in them, as doing so both legitimizes the journal and increases the impact of inadequately refereed research papers. Potential employers should scrutinize the publication lists of researcher applicants more closely. Regrettably, heightened awareness and increased diligence across the entire research community are urgently needed to maintain the integrity of peer-reviewed academic publishing and ensure that the benefits of open access are not fatally undermined by predatory publishers.

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