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Predatory Journals: A Growing Threat to Scientific Integrity?

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Predatory journals mimic mainstream academic publications but are characterised by the deliberate misrepresentation of the extent to which they abide by the accepted standards of peer-review. They threaten the credibility of academic publishing and can mislead the public about current scientific thought. Students and practitioners researching unfamiliar topics must also be vigilant. This article reviews the fraudulent behaviours exhibited by predatory journals, their potential impacts, and how they can be identified and combatted.

The peer-review model

Peer-review of manuscripts submitted to journals, based on feedback from authoritative colleagues working in the same field as the authors, is a mainstay of the academic publishing world. Peer-review has been criticised for bias and subjectivity, but it remains key in ensuring that published papers are reliable and trusted. Ecology and environmental management are based on a scientific understanding of the world. Members of CIEEM should therefore recognise how recent developments in open access publishing have opened the door to online predatory publishers.

The changing nature of academic publishing

The publishing world has changed dramatically since the invention of the world wide web (Beall 2017). Gone are



the days when academic papers were accessible only as paper copies on library shelves or posted to individual subscribers. The number of journals has mushroomed with the greatest growth being in those published online. Open access publication is also becoming more common. This has been hailed by some as a democratisation of research; with the results of scientific endeavour (often publicly funded) being available free of cost to a wider audience. The move to open access publication has, however, led to a redistribution of the costs of publication from subscribers to authors. Many open access journals charge authors fees from a few hundred to several thousand Euros depending on the length of the article, use of colour, and prestige of the journal. Whilst online publication does not carry the traditional costs of printing and postage, there remain justifiable costs associated with the peer-review process, editorial services and maintenance of the website, although it should be noted that as with subscription-based journals, reviewers remain unpaid. Online academic

journals are important sources of income for many publishers, including not-for-profit scientific societies.

Recognising predatory journals

The growth in online open access publication has, unfortunately, created an opportunity for unscrupulous publishers, who forego the established rules of peer-review, and charge authors to publish their work online with minimal input from reviewers or the editor. Predatory publishers deliberately seek to convince authors and readers that they offer a credible peer-review process through cynical and fraudulent misrepresentation. Predatory journals frequently mimic peer-reviewed journals by having similar names, while cutting costs on the very processes which give academic journals credibility in the eyes of the public and scientists alike. Hundreds of predatory journals now exist online, alongside established journals with hard-won reputations for academic excellence, and high editorial and production standards.

How then can we identify predatory journals? Jeffrey Beall, an American librarian, ran an online blog with a 'blacklist' of predatory journals and publishers from 2012 to 2017 (archived at <https://beallist.weebly.com/>). This work now continues at a website called 'Stop Predatory Journals' (SPJ) (<https://predatoryjournals.com>). The list can be consulted freely and identifies warning signs that a journal is predatory, including the following:

1. Charging for publication and falsely claiming to apply peer-review
2. Targeting potential authors through email spamming in attempts to get them to publish or serve on editorial boards (which then serve no useful purpose)
3. Listing scholars as members of editorial boards without their permission, not allowing such 'editors' to resign, and inventing fake scholars as editors
4. Quick acceptance of low-quality papers, including pseudo-science
5. Copying the design and content of websites of legitimate journals; sometimes combined with fraudulent or improper use of ISSNs
6. Giving false information about the location of the publishing operation
7. Fake, non-existent, or mis-represented impact factors (as a fraudulent measure of how often the journal has been cited).

The risks posed by predators

Predatory journals dilute the quality of academic literature with papers that have not been subject to adequate peer-review. They dupe and potentially mislead readers. Readers most at risk are those unfamiliar with a topic, such as students and those needing to research a new topic against a tight deadline. Many of the most prestigious academic and professional journals are hidden from scrutiny behind a subscription pay-wall. This increases the chance that the unwary will inadvertently resort to accessing less credible sources. In an unfortunate twist of fate, and an example of unintended consequences, the open access movement which criticises subscription journals as being elitist and undemocratic, has created the environment in which predatory journals are able to thrive. These predators hide in

plain sight and undermine the benefits of open access.

Predatory journals prey on unwary scholars who unwittingly submit their manuscripts to what amounts to a fake academic journal. Authors at risk are particularly those in developing countries, those early in their careers who are inexperienced and desperate to publish, and those working as enthusiastic amateurs or industry professionals who lack experience of academic publishing and peer-review.

The consequences for an author can be serious. Potentially valuable work may lose credibility through poor editorial input, loss of the opportunity to gain advice from knowledgeable peers via the review process, and simply through association with a predatory journal. Authors may also be subject to criticism for failing to show adequate judgement in choice of outlet for their work and risk having their work unread and their career prospects damaged.

Anti-predator defence strategies

Predatory journals can be difficult to identify with websites that appear very professional. How then can we protect the integrity of the scientific process, ourselves and our profession? Given that predatory journals specialise in deception, detecting signs of their activity may require some background research. Consulting the blacklists of suspected predatory journals, publishers and dubious impact factors (also available on the SPJ website) is a helpful first step for both readers and potential authors. The website Think, Check, Submit (www.thinkchecksubmit.org) is also a useful resource, and includes advice, and links to so-called whitelists of reputable journals that do employ peer-review (see Figure 1). Familiarity with a subject area and its journals is, however, indispensable because neither blacklists nor whitelists may be fully up to date. Consulting knowledgeable colleagues can be invaluable in highlighting journals that may be less than reliable. But for those without timely access to subject experts, and without personal knowledge of the specialist literature, other strategies are recommended.

Potential authors should be wary of unsolicited invitations to publish their work in unfamiliar journals. As research-active academics, we receive numerous invitations from the 'Editorial Staff' of predatory

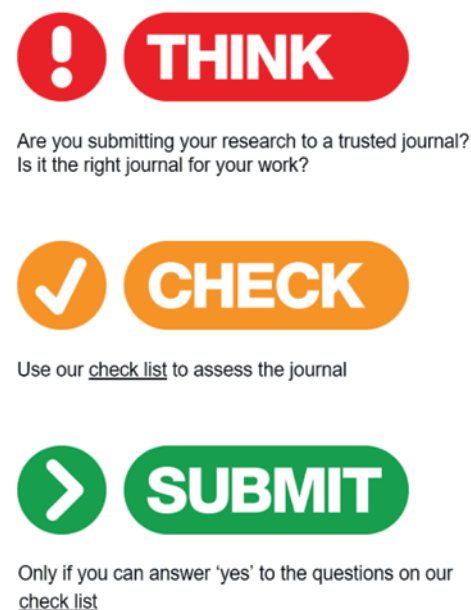


Figure 1. The Think, Check, Submit Toolbox available at www.thinkchecksubmit.org

journals suggesting that we might like to publish in their journal. It is usually obvious that the letter is computer-generated spam. Poor grammar, and lack of congruence between our research area and the journal title, are often further warning signs that this is not a 'real' journal.

Intending authors may find that researching the journal's editorial board independently from the information given on the journal's website will confirm suspicions. Does the information on the journal's website accord with that on an editor's personal web profile at their place of employment (typically a university or research institute)? If in doubt, you should consider contacting the editor directly, at their place of employment, before submitting a manuscript to the journal's website.

Browsing the content of journals can be revealing for potential authors and readers alike. Some predatory journals are conspicuous in that they provide an outlet for pseudo-science. Beall (2016) gives examples of journals publishing papers claiming that asbestos poses no threat to health, untested drugs are effective, nuclear power plants carry hitherto unknown risks, and climate change does not have anthropogenic causes. Superficially credible papers published in these same journals are unlikely to have been subject to peer-review. It is

also helpful to check whether the journal publishes papers that do not appear to match either the title or the stated scope. For example, whilst browsing an unfamiliar entomological journal we were surprised to find that it included a paper on the post-operative survival rates of cancer patients in a developing country. No credible academic journal specialising in entomology would publish a paper on this topic and we subsequently found that the journal is listed as a predator. Sadly, there are multiple potential victims in this story. First, some of the entomological papers in this journal looked credible but we now feel reluctant to read them. Second, the medical study may have some validity, but it is unlikely to be read by the medical community.

Common sense suggests that there must be a gradient in predatory behaviour, and the value of papers published, by predatory journals. In a response to issues raised by Beall (2017), one of his colleagues makes the insightful point that assessing the validity of information sources has always been an important aspect of scientific literacy (Swauger 2017). Some good papers may be published in predatory journals by authors who have been fooled into believing they offer peer-review publication. In that sense, while predatory journals lie towards one end of a gradient of sources of varying credibility, other factors must be borne in mind when considering individual papers. We have some sympathy for this nuanced viewpoint, but one of the defining issues in the debate about predatory journals must surely be the extent to which the publishers are engaging in outright dishonesty, i.e. they claim to conduct rigorous peer-review when they do not, and often use fake or stolen information on their websites. The boycotting of otherwise 'good' papers, inadvertently published in predatory journals, might therefore be necessary collateral damage in the fight for scientific integrity.

While it is important not to exaggerate the issue, readers clearly need to take extra care when considering citing or relying on work published in a journal that exhibits predatory characteristics. If these papers enter the scientific mainstream (e.g. through citation in papers published in more credible journals) there can be an erosion of credibility in the eyes of the public and politicians. Beall (2016) warns that papers published in some predatory journals appear in searches conducted through the trusted Google Scholar database used by students. Unfortunately, there is no simple answer to this problem. Swauger (2017) correctly recognises that teaching and practicing information literacy is essential but has always been difficult.

Conclusion

The growth of open access online publication has tremendous benefits but also has inadvertently opened the door to unscrupulous publishers, intent on profit, yet with no regard for scientific integrity. The situation is unlikely to change anytime soon, but knowing the risks reduces the potential damage. Ultimately, we all share a responsibility for the integrity of the scientific publishing underpinning our profession. If readers stumble across a suspected predatory journal they can report it online at the 'Stop Predatory Journals' website (<https://predatoryjournals.com>), whereupon it will be investigated and may be added to the list.

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Think, Check, Submit:
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