Reputable Peer-Reviewed Article Publishing: An Assessment of the IUPUI 2017 Annual Review Data

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Introduction

This report quantifies the number of articles by Indiana University Purdue University Indianapolis (IUPUI) authors that were published in 2017 in "trusted" journals or conference proceedings. As the global proportion of for-fee article publishing increases, so do the number of email solicitations to authors for submissions to previously unknown journals. In an effort to exploit a new business model, a portion of these solicitations seek to acquire a fee for publication while promising (but failing) to provide peer review. Publishing an article in a disreputable journal (intentionally or not) wastes the resources of the university, funders, and tax payers that have supported the work. It also risks damaging the reputation of authors and the integrity of peer reviewed literature. By quantifying the number of articles published in "trusted" journals, IUPUI can assess the degree to which authors need support for the task of selecting suitable outlets for publication.

Context

Scholarly journal publishing is a profitable industry largely subsidized by universities. In the middle of the 20th century, scholarly societies and universities began to outsource most of the labor of

managing the peer review process, copyediting, printing, and distribution for journals. At the beginning of the 21st century, publishers began to make digital versions of articles available to subscribers and, in some cases, on open access (OA) websites. Today, virtually all journal publishers make a digital version available and digital access to journal articles has become the dominate method of discovery for most readers (Ware & Mabe, 2015, p. 30). Although digital works can be replicated and distributed at very low costs, the price of an annual subscription to a scholarly journal increases annually by 5% - 6% (Bosch, Albee, & Henderson, 2018, p. 32). In 2018 the average annual price for a library subscription to a Chemistry journal topped $4,790.00 and the average price for a journal subscription across all fields exceeded $1,320.00 (Odell & Maixner, 2018, p. 3). The expense of subscribing to scholarly journals has placed nearly insurmountable paywalls between many readers and the literature that they need to conduct research, educate students, and to make evidence-based decisions.

At the same time, the publishing marketplace continues to consolidate. As of 2015, only five publishers are responsible for a majority of the world's annual journal article production (Larivière, Haustein, & Mongeon, 2015, p. 3). These publishers also market many of the online data systems used at universities for a variety of purposes—from document creation to website hosting and data analytics. Even as library budgets have not increased and while most digital publishing could be sustained by universities at a fraction of the cost, these large for-profit publishers have continued to grow with annual profits margins of 30% to 40% (Larivière, Haustein, & Mongeon, 2015, p. 10). As these for-profit companies have begun to market other information and data systems to universities, it is likely that the financial strain that libraries have experienced for many years will soon begin to put pressure on other sectors of university budgets.

Open access dissemination leverages the availability of web-based discovery and the affordability of digital production. It provides free access to articles that are often available with licenses to permit reuse on other websites, in the classroom, and in research applications (e.g., in datamining and artificial intelligence systems). Works made openly available provide some relief to readers working at institutions

that cannot afford access to large subscription collections—a problem that even some of the wealthiest institutions now face (SPARC, 2019). However, in one way or another, open access is also subsidized by universities. Open access literature is made available in four key ways:

1. *Green open access*: Often described as "self-archiving," green open access is the practice of making a version of a published work openly available in an institutional or disciplinary repository. Thus, an article may be published in a paywalled journal, but is also made freely accessible from an open access website. The most common sources of green open access literature from the IUPUI campus are IUPUI ScholarWorks (https://scholarworks.iupui.edu/) and PubMed Central (https://www.ncbi.nlm.nih.gov/pmc/). Like many U.S. universities, IUPUI has adopted green open access at a campus-wide policy level and now makes 70% of its faculty's annual article literature freely available to readers (Center for Digital Scholarship, 2018a, p. 3).

2. *No-fee open access journals (a.k.a. "Gold OA")*: The majority of open access journals do not charge fees to submitting authors—over 70% of the 12,000 open access journals included in the Directory of Open Access Journals (https://www.doaj.org/) are no-fee journals. These journals have no financial incentive to skip peer review and most are hosted and published by universities and scholarly societies. In fact, IUPUI University Library currently hosts more than 15 no-fee, open access journals for the IUPUI community (https://journals.iupui.edu/).

3. *For-fee open access journals (a.k.a. "Gold OA")*: Although most open access journals do not charge fees to authors, faculty members are more likely to be familiar with those that require article processing charges (APCs). Reliable publishers require the payment of APCs after peer review but before publication. The APC open access publishing model became widespread at the beginning of this century with the launch of BioMed Central (BMC) and Public Library of Science (PLOS). Following the success of these ventures, nearly every major publisher of scholarly journals launched or converted journals to for-fee open access. As of 2016, authors from the IUPUI campus began publishing more than 12% of institution's annual article

production in OA journals (Odell, 2016). In fact, for the last five years the two most popular

journals for articles by IUPUI authors are for-fee OA journals (*PLOS ONE*, 300 articles;

Scientific Reports, 104 articles). (Web of Science search, for IUPUI Articles 2013-2017, search

date December 14, 2018). APCs, however, create their own barriers; authors that cannot afford

the fee cannot publish in these journals. To reduce this barrier for IUPUI authors working on

research with limited access to grant funding, the campus launched an open access publishing

fund in 2013 (http://www.ulib.iupui.edu/digitalscholarship/openaccess/oafund). The fund

supports fees for articles by IUPUI authors that have been accepted for publication in journals

indexed by the Directory of Open Access Journals. To date, the fund has provided more than

$200,000.00 in support to IUPUI authors (Center for Digital Scholarship, 2018 June, p. 1).

4. *For-fee open access in subscription journals (a.k.a. "Gold OA")*: Most large publishers offer

   authors a for-fee choice to make an article published in a subscription journal freely accessible to

   readers—this practice is often referred to as "hybrid open access." If the author's institution is

   one of the journal's subscribers, the expense of publishing the article is inadvertently supported

   twice. Thus, many consider hybrid open access to be a form of double-dipping on university

   budgets; once in a subscription for the journal and once more in funds to support the author's

   choice. Furthermore, these fees are often greater than those charged by reputable, fully open

   access journals. Given that most subscription publishers offer authors a for-fee choice for open

   access, many articles could be made open access, but this would be an added expense on top of an

   already inflated and unsustainable publishing marketplace for scholarly literature.

Disreputable, for-fee open access journals: All approaches to scholarly publishing have been subject

to fraudulent practices, but the direct-to-consumer marketing practices of for-fee open access publishing

raises the visibility of real and potential fraud in the publishing marketplace. In a print-only or

subscription-only marketplace, librarians receive most of the "junk mail" solicitations for customers of

low quality publications. In for-fee publishing models, authors are the customers and receive most of the

solicitations from both reputable and disreputable publishers. Faced with a torrent of junk mail and the risks of publishing in a journal that fails to observe the norms of the responsible conduct of research, some authors may be reluctant to participate in open access publishing of any kind—these authors may overlook reputable, well-established open access journals.

Sadly, initial efforts to establish the boundaries of trust in the for-fee open access marketplace have focused on the scandal more so than on solutions. The label, "predatory journals", and the list of suspected "predatory journals" formerly maintained by Jeffrey Beall have done more to confuse authors than to inform them. Beall's website blacklisted new open access journals and took a guilty-until-proven-innocent approach to journals launched in non-Western or non-English speaking countries (Abrasco, 2015). As a result, many of the authors that would benefit the most from open access publishing could be stigmatized for having published in a journal that Jeffrey Beall did not like (Berger & Cirasella, 2015). To counter a potentially capricious blacklist, libraries, publishers, and funding agencies joined together to promote the "Think. Check. Submit." campaign and website (https://thinkchecksubmit.org/). This website provides authors with criteria to identify trusted publishers and links to an index of journals that have met the basic criteria to be included in the Directory of Open Access Journals (DOAJ). The "Think. Check. Submit." criteria also align with IUPUI's Open Access Publishing Fund policy and with the majority of library-managed, OA publishing funds in the United States—in short, to be eligible for support, the journal must be included in the DOAJ or the publisher must be a member of the Open Access Scholarly Publishing Association (OASPA) (https://oaspa.org/). Given that the majority of funders require DOAJ inclusion or OASPA membership, any for-fee OA publisher that fails to meet the criteria for inclusion is, at best, unaware of the prevailing demands of the marketplace and probably ill-prepared to sustain a reputable, peer-reviewed journal. It is possible, however, that these journals are conducting peer-review and doing their best to provide the services that an author's article processing charges are meant to sustain. While these journals have not met criteria to be trusted as reputable, it would be unjust to label them as "predatory" without evidence of false advertising or research misconduct. For this reason, this

report does not classify journals as "predatory," but rather categorizes journals as *trusted*, *disreputable* (appearing to participate in false advertising), and *undetermined* (lacking evidence of reputable practices).

Methods

  Data Preparation: This analysis focusses closely on for-fee open access publishing at IUPUI during 2017. The data reflects all published, peer-reviewed articles and conference proceedings contributed as "Publications/Scholarship of Discovery" in the Digital Measures Activity Insight (DMAI) annual review system. The 2017 data set included items submitted by faculty in all IUPUI schools except for the School of Medicine. (When Medicine adopts DMAI for annual reviews, it will greatly increase the size of the data set.) Book chapters, book reviews, books, accepted works, submitted works, and works under revision were excluded from the data set. Likewise, conference proceedings that did not include a published paper were excluded; typically, these excluded works were short conference abstracts, conference posters, and conference presentation slides. In addition, duplicated items were excluded. Identifying data were stripped from the data set in so far as possible. The DMAI submitting faculty member's personal information was removed, but the faculty member's school was retained. Also, in order to code publications, enough bibliographic data was retained to find and assess the outlet of publication. In this report, only the author's school and the name of the publisher are shared with readers.

  The final data set represents 1,099 published scholarly articles (942 journal articles and 157 conference papers) by IUPUI faculty authors in 2017.

  Data Processing: After normalizing journal titles with OpenRefine's Facet function, we used R to retrieve publisher information and ISSNs from the SHERPA/RoMEO API. As a next step, we used the Directory of Open Access Journals (DOAJ) API to search by ISSN for inclusion status in the directory. By retrieving information from SHERPA/RoMEO and DOAJ, we were able to reduce hand coding from 1,099 records to 502 records (345 articles and 157 conference proceedings).

Coding: The 703 unique journals in this data set were coded in three categories: "trusted," "disreputable," and "undetermined."

1. *Trusted*: Journals were coded "trusted" when they met one of the following criteria:

1.1 Journal access is by subscription: Subscription journals are not immune to misconduct and fraudulent practices. In addition, some subscription journals also require authors to pay publishing fees or page charges. Nonetheless, subscription journals are marked "trusted" in this analysis. The methods for verifying the responsible conduct of peer review in subscription journals are both more complicated and, regrettably, of less concern to authors.

1.2 No-fee open access journals: Journals that do not require article processing charges are under no direct financial pressure to mislead authors or to violate the norms of peer review.

1.3 Journal is included in the Directory of Open Access Journals (DOAJ): the DOAJ is a curated, international index of more than 12,000 trusted, fully open access journals—only a third of these journals require article processing charges.

1.4 Journal is published by a member of the Open Access Scholarly Publishers Association (OASPA): Meeting the requirements for inclusion in the OASPA requires the completion of an application and review process. Newer journals were marked "trusted," if the publisher of the journal met the criteria for membership in OASPA.

1.5 Journal was formerly a subscription journal with a long publishing history: new publishers of OA journals with an established record of publishing subscription journals will be likely to complete applications to OASPA and the DOAJ. Therefore, future inclusion in these sites is to be expected.

1.6 Journal is published by a non-profit university or non-profit scholarly society: If the journal does not meet one of the above criteria and it can be verified that it is published by a non-profit university or a non-profit society, then the journal was marked "trusted." To verify a publisher's affiliation with a nonprofit, scholarly entity, the journal must be identified as belonging to the university or society on

the university's or the society's website. The sole use of this criteria did not apply to any of the journals in the data set described in this report.

2. *Disreputable:* If journals met none of the criteria listed in 1.1-1.6, they were coded "disreputable" when meeting one or more of the following:

   2.1 Government Censure: The FTC, the NIH, or another federal government agency identifies the publisher as potentially fraudulent. Currently, therefore, all journals published by OMICS or one of its affiliated companies were coded as "disreputable."

   2.2 False or misleading claims regarding indexing: if the journal claims to be included in an index such as the DOAJ or PubMed MEDLINE, but the journal is not included in the index, the journal were coded "disreputable." In some cases, a journal title will be included in an index, but only partially (for a single issue, for example). In these circumstances, if the journal is not transparent about the scope of the indexing, it is likely that they seek to mislead authors.

   2.3 False or misleading claims about society or university sponsorship: If a journal claims to be affiliated with a non-profit society or university, but this affiliation cannot be verified (see 1.6 above), the journal is likely seeking to mislead authors.

   2.4 False or misleading claims about the journal's origin or scope: Some journals, for example, advertise their scope as "American" and yet have no editors affiliated with "American" institutions and have published no (or few) articles written by authors affiliated with "American" institutions.

3. *Undetermined:* Journals that did not meet one of the criteria for "trusted" in 1.1-1.6, but could not be verified as "disreputable" (2.1-2.4) were coded as "undetermined."

Results

Of the 1,099 articles in this data set, 1,080 (98.3%) were published by "trusted" journals or conference proceedings. The remaining items included 14 articles in "disreputable" journals and 5 articles in journals coded "undetermined" (Table 1).

Table 1. Articles published in Trusted, Disreputable, or Undetermined journals.	
Category	*Number of Articles*
Trusted	1080 (98.3%)
Disreputable	14 (1.3%)
Undetermined	5 (.5%)
total	*1099*

Of the 1080 articles published in "Trusted" journals, 11.9% (128) were published in open access journals indexed by the DOAJ or published on a no-fee basis by universities and scholarly societies. Although a large majority of the 1080 articles in "Trusted" journals were published in subscription journals, most have been made open access in accordance with the IUPUI Open Access policy (https://openaccess.iupui.edu/).

The 14 articles published in "Disreputable" journals were all from authors writing in the scientific, technical, or medical (STM) disciplines (Table 2). In the case of three of these articles, the corresponding authors were from other universities.

Table 2. Count of articles by school of corresponding author		
School	*Number of Articles*	*Estimated Fees for Publishing (USD)*
Dentistry	4	3835.00
Engineering	3	1544.00
Science	2	1589.00
Medicine	2	2818.00

For these three articles, it is unlikely that the publishing fees were supported by IUPUI departments. It is also possible that the IUPUI affiliated co-authors for these three articles had little

influence on the selection of the journal. On the other hand, for the remaining 11 articles published in "Disreputable" journals, the corresponding authors were affiliated with IUPUI at the time that the article was published. In these cases, although it is possible that the fees were waived or that the authors paid for them with personal funds, it is likely that IUPUI departments supported the article processing charges. Of the 11 articles with IUPUI corresponding authors, all articles were authored by faculty with a rank above the Assistant level (Table 3).

Table 3. Count of Faculty Authors by Rank		
Rank	*Corresponding Author(s)*	*Co-Authors*
Professor	4	7
Associate	7	6
Assistant	0	3

Table 4. Publishers of Journals Coded "Disreputable"	
Publisher	*Journals Coded "Disreputable"*
Juniper Publishers	2
MedCrave	2
BioMedRes	1
Ecronicon	1
International Journal of Network Security	1
International Journal of Scientific & Engineering Research (IJSER)	1
iMed Publishing	1
J SciMed	1
Journal of Multidisciplinary Engineering Science and Technology (JMEST)	1

Oatext	1
OMICS International	1
Scientific Research Publishing (SCRIP)	1

Recommendations

These findings should be understood within the global context of an evolving scholarly publishing ecosystem. IUPUI's rate of publishing in "Disreputable" journals for the year 2017 (1.3%) is substantially less than estimates of the global rate. Shen and Bjork (2015) estimated a global production of 420,000 articles in "predatory" journals in 2014. In a more conservative estimate, Crawford (2015) reported 150,000 articles for the same year. If the global output of journal articles is 2.5 million per year (Ware & Mabe, 2015, p. 6), this would mean that "predatory" journals account for 17% or 6% of article literature by these estimates. Given the low rate that IUPUI authors publish in "Disreputable" journals, policy-level or administrative interventions are likely to cause more harms than benefits. Rule-making on this issue could reduce academic freedom for IUPUI authors and result in unnecessarily restrictive approaches to scholarly dissemination. For these reasons, outreach and education are better approaches.

IUPUI libraries currently provide assistance to authors that seek to identify potential outlets for publication. This assistance is provided in two forms—web-based information and personal consultations. The libraries provide two curated, online guides to identifying and selecting suitable journals for publication—one focusses on open access journals (http://www.ulib.iupui.edu/digitalscholarship/openaccess/oajournals) and another provides tools and suggestions for subscription and OA journal selection (http://iupui.libguides.com/scholarlyimpact/publishing). Both of these local guides rely on Think.Check.Submit., a website developed by publishers, universities, and non-profit organizations to help authors identify reliable OA journals (https://thinkchecksubmit.org/).

Authors that would like to schedule a consultation, can contact the IUPUI University Library

Center for Digital Scholarship (digschol@iupui.edu), the Ruth Lilly Medical Library

(medlref@iupui.edu), or the IU School of Dentistry Library (dentlib@iupui.edu).

In addition to web-based and one-to-one services, librarians are available for group presentations

on topics related to open access, choosing a reputable journal, and the responsible use of research metrics.

This educational programming will most benefit post-doctoral scholars and incoming faculty members.

Getting the attention of established associate and full faculty members may be more difficult. Sharing

reports, such as this one, with the deans of schools at most risk for selecting a less-than reputable journal

or conference may be one way of reaching this audience.

Acknowledgements

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