

Open Access and the Future of Scholarly Communication

Implementation

Edited by
Kevin L. Smith
Katherine A. Dickson

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Chapter Four

Paying to Publish

Open Access Author Fees and Libraries' Initiative to Fund Publishing Costs

Stephen M. Arougheti

Free to read but not produce, some open access journals impose author fees to subsidize operational cost; as faculty indicate, these fees are the primary deterrent to publishing in open access journals. In response to popular demand and favorable returns, an increasing number of academic libraries in the United States are paying author fees on behalf of researchers affiliated with their universities, thus supporting the dissemination of scholarship and promoting the benefits of open access. With author funds gaining increasing prominence, librarians are deriving lessons for improving service, utilizing their financial resources, and expanding impact.

Serving as a microcosm of libraries' efforts to affect the role of open access within scholarly publishing, author funds establish an impactful tool for altering and incentivizing the long-term publishing habits of faculty. Beyond allocating funds to subsidize author fees, libraries' cost-minimizing responses to the "pay to publish" model include institutional membership subscriptions and consortium agreements. Libraries demonstrate a history of commitment to disseminating scholarship so that it reaches the greatest audience possible and optimizes research's potential for societal impact. Author funds are a viable strategy to advance the unfettered sharing of knowledge and fulfill a library's commitment to open access.

OPEN ACCESS AS A FUNDAMENTAL RIGHT AND ITS CHALLENGE TO THE TRADITIONAL MODEL OF PUBLISHING

Definitions of *open access* primarily draw on three authoritative documents: the “Bethesda Statement on Open Access Publishing,” the “Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities,” and the “Budapest Open Access Initiative.” Although generally well-understood, what qualifies as open access often contains nuance depending on the organization or individual defining the term. In brief, open access may be thought of as the “free, immediate, online availability of research articles, coupled with the rights to use these articles fully in the digital environment” (Scholarly Publishing and Academic Resources Coalition 2007).

Open access was born from the idea that information deserves to be free—with *free* defined not as absent cost but rather without barriers that prevent access to information and the knowledge it confers. Ideas are most powerful when shared, and too often it is artificial, societally created barriers that restrict the dissemination of information. Arguments supporting open access rely on a dual reasoning rooted first in a principled stance derived from moral standards and second from a functional recognition that shared knowledge inspires innovation.

The ethical argument contends that people deserve “to know what is known” (Willinsky and Alperin 2013, 25). This idea is inspired by an ethical conviction that inherent to research is the indispensable quality of knowledge, giving rise to the moral standard of equity. The functional argument considers the influence of knowledge in strengthening the disenfranchised and helping a society to achieve its potential. Increased access to knowledge “leads to opportunities for equitable economic and social development, and intercultural dialogue, and has the potential to spark innovation” (Swan 2012, 6).

Within the larger context of societal advancement are segments of the population (e.g., doctors, businesses, and scholars) that are implementing open access policies as a strategy for optimizing operations. The Human Genome Project, a monumental undertaking by the government and private sector to sequence three billion letters of the human DNA code, provided incomparable opportunities for geneticists to understand the correlation between genes and disease. Permitting decoded genetic sequences to be publicly available engendered advances in medicine to the benefit of society.

Throughout universities and across the world, open access is becoming ingrained within scholarly publishing. One is hard-pressed to identify a large American university that does not actively foster an open access culture and promote its benefits. As the premier institutions on university campuses for connecting researchers with information, libraries are ideally situated to promote open access throughout the academic community.

For 350 years, scholarly publishing and the peer review process served as a model for the dissemination of research and became the cornerstones of academia (Royal Society 2015). Developments within the scholarly publishing industry created an environment conducive to the growth of open access. An exponential rise in the yearly price of journal subscriptions—serial costs at ARL libraries rose 402 percent from 1986 to 2011—coupled with reduced library budgets necessitated a reevaluation within libraries of collection development methodologies (Association of Research Libraries 2012). Reacting to worsening financial challenges, libraries recognized that open access provided a counterbalance to rising costs.

Beyond the ethical and functional aspects of open access, libraries are struggling to resolve the practical implications of implementing open access. For many individuals, *open access* connotes *free* (i.e., without cost to create), but this assumption is based on false generalizations. When discussing open access, the term *free* relates instead to the individual being able to access content at no cost. As discussed in an FAQ related to the 2002 Budapest Open Access Initiative,

“Free” is ambiguous. We mean free for readers, not free for producers. We know that open-access literature is not free (without cost) to produce. But that does not foreclose the possibility of making it free of charge (without price) for readers and users. The costs of producing open-access literature are much lower than the costs of producing print literature or toll-access online literature. (Budapest Open Access Initiative 2012a)

As open access is not completely free, it is valuable to understand the structure publishers use to finance their costs. According to the traditional publishing model, publishers financed their business operations by charging to access content; this cost was often assumed by academic libraries to ensure access for the universities’ constituencies. Library budgets were strained, and access was denied to those without the financial wherewithal to pay these often-prohibitive charges.

To finance the costs associated with producing open access literature, publishers are imposing charges on authors when their manuscripts are accepted for publication. Charges ranging from hundreds to thousands of dollars often require authors to seek financial assistance from third-party partners. Although financial assistance for authors is available from a variety of sources, most notably from grants, there is a persistent void in monetary support for large portions of the research community. To compensate for this void, librarians are pursuing a variety of alternatives to ensure that authors who wish to make their work available through author fees based open access have the funding necessary to do so. For academic libraries seeking to promote open access throughout the universities, financially subsidizing au-

thor charges provides a fulcrum to assert influence within scholarly publishing.

Efforts by libraries to implement a sustainable open access policy model are not without challenges; an assortment of barriers inhibits the advancement of open access. Each barrier represents a real hurdle, whether it is artificial (e.g., permission barriers created by copyright restrictions), economic (e.g., funding the publication of articles in open access journals), or technological (e.g., creating discoverable content in an institutional repository). Modern and innovative approaches are required to surmount these barriers.

IMPEDIMENTS TO A SUSTAINABLE OPEN ACCESS MODEL: RECOGNIZING AND OVERCOMING PERMISSION AND PRICE BARRIERS

Peter Suber, a “champion for open access” and the recipient of the ALA’s prestigious L. Ray Patterson Copyright Award for his seminal contribution to scholarly communications, identifies both permission and price barriers as inhibiting the free sharing of research (Suber 2012, 8; Terry 2011). Permission barriers involve the exclusive rights conferred on the copyright holder to restrict others’ use of a copyrighted work. Designed to protect the intellectual and financial entitlements of the creator, copyright bestows on its owner a right to allow or restrict access. The permission barrier results in a price barrier when a copyright owner assesses a fee to access a protected work, denying access to those unable to afford the price. Both price barriers and permission barriers limit the utility of information and ideas.

Permission and price barriers not only disadvantage the greater segment of society that is unable to access content but also limit the author’s ability to share the value and maximize the impact of their research. Permission barriers restrict others’ ability to innovate by denying them the opportunity to reuse or repurpose information. Examples of price barriers’ negative effects include unaffordable article processing charges, exorbitant prices for users to access information, and the straining of finite library budgets. Either independently or in confluence, each artificially designed barrier hampers access to content and limits the opportunity for research to achieve optimal potential and influence.

The permission barrier presents itself to many users when published research is not readily available in a library’s collection. Universities operate as engines for innovation, but permission barriers limit researchers’ ability to repurpose ideas for the development of knowledge. While permission barriers are at times readily evident, for many university constituents, the limitations imposed by price barriers are frequently inconspicuous.

Select scholars who choose to publish in open access journals may confront the obstacle of paying article processing charges. But many university constituents, although they may be aware of such limitations in the abstract, do not often confront such barriers as a regular occurrence when sharing research through the traditional publishing model. The article processing charges for scholars publishing in open access journals are a barrier deterring researchers who are unable to pay the price. Just as price barriers present themselves at the front end of the publishing process in the form of article processing charges, they are likewise recognizable at the back end, when the cost of purchase is unaffordable.

Universities pay a considerable financial price for permission to grant their users access to published research. Librarians are responsible for licensing content from publishers through paid subscriptions to scholarly journals. Due to declining library acquisitions budgets and a precipitous rise in subscription costs, librarians are required to decide which content will be readily available to university constituents and which content will remain hidden behind a paywall. Both article processing fees and library subscription costs present price barriers that impose recognizable limitations on the free sharing of information.

To a certain extent, the term *open access* is a misnomer; it leads people to think in terms of “no cost.” On the contrary, while the cost may be concealed from some users, many publishers require authors to pay for the option of making their work openly accessible. Needing to cover costs associated with the peer review process and publishing the article, many publishers assess authors a fee for their work to be available through open access. For many authors, this price barrier dissuades them from offering their work openly. But for authors with a preference for circulating their research through open access, libraries are emerging as a suitable recourse.

The publisher Public Library of Science explains that to “provide Open Access, PLOS uses a business model to offset expenses—including those of peer review management, journal production and online hosting and archiving—by charging a publication fee to the authors, institutions or funders for each article published” (Public Library of Science 2015). A business model predicated on charging authors a prepublication fee rather than institutions a postpublication subscription rate evidences a not-so-subtle paradigm shift in the publication process. This fundamental shift occurs with both the payment structure and, more importantly, the accessibility of the article.

Although both models, to some extent, require libraries to continue financing access to articles, the costs are dramatically reduced as a result of the paradigm shift to library funding being offered prepublication rather than postpublication. Whereas the postpublication model requires libraries to subsidize access to journal content by paying annual subscription costs in perpetuity, the prepublication model requires a single payment to permit the de-

posit of the article on an open access platform. More importantly, research submitted through the prepublication model results in articles that are no longer restricted to subscribers but rather immediately and freely available to all.

The postpublication business model requires scholars to submit their research to a journal, which oversees the peer review process. Once the article is approved for publication, the author's involvement largely ceases. Authors often cede copyright control under this model, granting the publisher exclusive rights to control and disseminate the article. Granting exclusive rights often results in publishers selling access at a prohibitive price, requiring libraries to assume the costs in order to guarantee their constituents access to the content. Of the portion of academic libraries' budgets reserved for the acquisition of information resources, half is allocated for electronic current serial subscriptions (U.S. Department of Education 2014). Financially, the postpublication business model serves publishers well by generating lucrative profits. As reported in November 2012 by the International Association of Scientific, Technical, and Medical Publishers (a collection of 120 members in 21 countries who collectively publish 66 percent of global journal articles), the "annual revenues generated from English-language STM journal publishing are estimated at about \$9.4 billion in 2011 (up from \$8 billion in 2008), within a broader STM information publishing market worth some \$23.5 billion" (Ware and Mabe 2012). This financial boon for publishers occurred at the expense of libraries, as exponentially rising costs depleted acquisition budgets.

Authors create artificial permission and price barriers when they relinquish their intellectual property rights and grant a publisher the exclusive right to control distribution of their work. In addition to such artificial barriers, other recurring access barriers are societal in nature.¹ Peter Suber identifies four societally infused barriers that inhibit universal access to information: censorship, language barriers (a work not translated beyond the published language), accessibility for the disabled, and technological hurdles (Suber 2012, 26–27). While considerable efforts by governments, businesses, and nonprofit organizations to overcome societal barriers are proving successful, librarians and the open access movement are primarily focused on the artificial barriers imposed by authors and publishers.

Understandably or not, publishing companies prioritize profit margins above altruistic concerns for authors and society. To improve public access to published research, academic librarians are actively pursuing strategies to persuade authors to preserve the intellectual property rights to their work. To transform the traditional publishing model to a sustainable open access business model, authors and librarians will need to provide the impetus for change. Librarians have been the primary vanguard for the transformation to open access. As champions for the egalitarian principles encapsulated in

open access, librarians and global advocates across disciplines and nationalities continue to pursue sustainable publishing business models.

Under either publishing model, an economic framework that can sustain the costs associated with the peer review process is necessary. The 2011 “PEER Economics Report,” which was devised to study, among other issues, publishers’ cost structure, states,

Reputation is a critical source of competitive advantage in scholarly publishing. Robustness of selection and the involvement of prestigious reviewers drives reputation. At the same time, peer review is a costly activity that can be standardized only marginally. Even if it is outsourced and rarely remunerated the publisher still has to bear the cost of managing peer review. Such costs correlate with the rejection rate of the journals, to the number of reviewers per manuscript and to the number of rounds of review. (Centro ASK, Università Bocconi 2011, 39)

Premier journals maintain a respected reputation because of their selective peer review process. In general, it is true that the more prestigious a journal’s reputation, the higher its operational costs and the greater the need to assess higher rates to sustain operations.

Because open access journal publishers do not charge libraries and other purchasing institutions the subscription costs necessary to subsidize peer review expenses, they must pursue other channels—including imposing article processing charges on authors—to recoup their overhead. By doing so, they transfer remittance from the back end to the front end of the publication cycle—from libraries to authors. Total article processing charges, determined by competitive considerations, market conditions, journal impact factor, article type, journal function, editorial processes, and technical features, can range between five hundred and five thousand dollars. Because article processing charges can be expensive, third-party support is needed to subsidize their payment.

Many scholars receiving financial support for their research through grants are able to apply the awarded funding toward paying article processing charges. As the primary funder of research at American universities, the federal government requires that publicly funded research be freely available online; this mandate increases opportunities for researchers to receive the financial support necessary to publish in open access journals.² Nevertheless, not all researchers who desire to publish in open access journals are able to obtain financing to subsidize article processing charges. At times, the greatest obstacle to research being freely available is a lack of impetus from authors to take action. Realizing an avenue to advance open access, librarians are providing the necessary motivation by allocating portions of their budgets to pay the article processing charges for researchers affiliated with their universities. Library subsidization of article processing charges through au-

thor funds helps guarantee that researchers who want their work freely available have the means to do so.

For academic libraries, the “old model” of traditional publishing provided a reliable stream of quality information that was vetted through the peer review process. Despite these benefits, the exponentially rising cost of bundled journal subscriptions has become increasingly untenable. Michael Eisen notes, “Every year universities, governments and other organizations spend in excess of \$10 billion dollars to buy back access to papers their researchers gave to journals for free, while most teachers, students, health care providers and members of the public are left out in the cold” (2013).

Beyond these practical implications, many librarians possess an ideological commitment to a philosophy of egalitarianism—as eloquently stated by the American Library Association motto adopted in 1892 and reinstated by the ALA Council in 1988, “The best reading, for the largest number, at the least cost” (American Library Association 1988). Along with the technological advances associated with the proliferation of digital publishing and the growing ubiquity of the Internet, the increasing resolve of researchers, universities, libraries, publishers, and nonprofits provides an opportunity to shift the publishing industry to a “new model.” Relying on article processing charges, the new model enables research once restricted by paywalls to be freely available to the greater public.

During the nascent stages of open access, librarians anticipated a variety of benefits, including a solution to the exponentially rising cost of serials subscriptions. Although the potential persists for open access to reduce prices over the long term, libraries remain reliant on bundled subscription packages. A study of the availability and growth of open access (charting trends within a pair of publication ranges from 1998 to 2006 and 2005 to 2010) reveals that open access publications account for only 23.8 percent of the market, with 1 percent annual growth (Gargouri et al. 2012). Despite historical trends indicating limited growth of open access, many still predict that the predominance of open access journals is inevitable: “Gold OA could account for 50 percent of the scholarly journal articles sometime between 2017 and 2021” (Lewis 2012). The adoption by companies like Elsevier and Springer of financially stable open access policies sustained by article processing charges is indicative of the continued proliferation of open access journals in the marketplace. If open access journals are to reduce the impact of subscription costs on library budgets, then investing in such supportive strategies as author funds may be a sensible endeavor to effect change.

CONSTRUCTING AN OPEN ACCESS MODEL TO ACCOUNT FOR FACULTY'S MOTIVATING FACTORS

Academic libraries operate as an ancillary institution within universities and are increasingly redefining their role within an evolving university landscape. Library support for the university involves a core mission of facilitating faculty research efforts. To achieve this mission, librarians are optimizing the value of open access to help meet the needs of researchers. Influencing faculty publishing habits to support open access involves aligning library services and policy with their professional interests. Appreciating the factors that motivate the publishing habits of faculty involves recognizing, first, the expectations and requirements of faculty to publish their research and, second, how open access can best be positioned to serve their interests.

Librarians embed with faculty throughout the university to better appreciate their research and publishing motives. Rather than seeking involvement at the end of the process, when faculty are submitting their manuscripts to journals, librarians are becoming active participants early in the research process, for example, by assisting with grant writing and data curation. "Embedded librarianship is a distinctive innovation that moves the librarians out of libraries and creates a new model of library and information work. It emphasizes the importance of forming a strong working relationship between the librarian and a group or team of people who need the librarian's information expertise" (Shumaker 2012, 4). As a result, librarians are better positioned to appreciate the factors motivating faculty publishing and influence how research is disseminated.

Despite many researchers' positive opinion of open access and its benefits, it is not the primary factor most scholars consider when determining where to publish. Concerns pertaining to a journal's reputation, proficiency, openness of peer review process, indexing in disciplinary databases, and impact factor were most important in determining where to publish (Bird 2010). Librarian intentions to persuade faculty to publish in open access journals require consideration of these predominant concerns.

Although increased discoverability and an upsurge in an article's impact factor are among the more well-perceived benefits of open access for researchers, there is contention about the correlation between open access and impact factor. In an effort to ascertain the extent of this possible correlation, the Scholarly Publishing and Academic Research Coalition Europe identified seventy studies designed to evaluate the connection between open access and impact factor by evaluating citation metrics (Scholarly Publishing and Academic Research Coalition Europe 2015). Implementing different methodology and data, forty-six studies found a positive correlation, seventeen indicated no advantage related to increasing citation totals, and seven were deemed to be inconclusive or failed to establish a significant increase. Beyond these

conclusions regarding their own impact factors, researchers should also consider additional advantages, including the personal benefit of gaining greater access to the data and experience of others. The opportunity to expand and build on the studies of others allows researchers to broaden their own research to achieve greater results.

Despite the benefits of open access, there remain significant deterrents that inhibit faculty willingness to publish in open access journals. The primary factor deterring researchers from publishing in open access journals is the cost of article processing (Dallmeier-Tiessen et al. 2011). A smaller percentage of researchers indicate a variety of other barriers, including accessibility, a perception of inferior quality, unawareness of open access journals relevant to their areas of study, or simply established habits.

Because authors emphasize journal impact factor when determining where to submit their research, publishers assess higher article processing charges for publication in more influential journals with higher ISI impact factor rankings (Solomon and Bjork 2012). These higher-ranked journals are frequently associated with well-funded disciplines of study whose authors are often recipients of grants that can be used to aid in payment of article processing charges (Solomon and Bjork 2012). For those in the research community able to obtain outside funding, the lack of a financial deterrent provides an open avenue to publication in open access journals.

Faculty in disciplines not receiving sufficient funding from outside sources, along with less-established researchers (e.g., adjuncts, postdocs, or graduate students), comprise a valuable portion of the university constituency that would be well served by receiving support in the form of funding from the library. Libraries offering author funds provide an effective and advantageous resource for researchers who would otherwise be unable to afford the cost of article processing.

SUPPORTING THE “PAY TO PUBLISH” MODEL: LIBRARIES AND THE CREATION OF AUTHOR FUNDS

With an agenda to promote and expand open access, academic libraries employ creative strategies to market their benefits and encourage researchers within the university to publish in open access journals. For a diversity of reasons, including an appreciation for the ethical and functional imperative and improving opportunities associated with career advancement, many researchers readily publish in open access journals. In an effort to better appreciate the motives and perceptions of researchers regarding open access, an international and multidisciplinary study solicited feedback from 53,890 individuals, 46,006 of whom identified as active researchers and 38,358 of whom “published at least one peer-reviewed research article in the last five

years” (Dallmeier-Tiessen et al. 2011). The results of the study demonstrate substantial support for open access among respondents and highlight barriers (some resulting from a misperception of open access) that prevent their publishing in open access journals.

For those with a history of publishing in open access journals, there is, as expected, a high level of support for the intrinsic benefits of open access, with 89 percent of respondents believing open access directly benefits their field of study. For researchers without experience in open access publishing, 39 percent (the largest grouping) identify concerns with funding as the primary impediment to publishing in open access journals. Academic libraries overcome the deterrent of financial obstacles for many researchers by establishing author funds to subsidize the article processing charges involved with publishing in open access journals. Designed in part as a marketing tool to promote open access, author funds help libraries reach out to the universities’ researchers and incentivize faculty to publish in open access journals.

For many researchers, grants and endowments provide financial support to pay article processing charges. The federal government’s effort to promote open access by mandating that federally funded research and data be immediately and freely available improved the ability of researchers to receive financial assistance to publish their research in open access journals. Still, a void exists for many authors who are unable to afford these costs or receive subsidies through grant funding. Academic libraries have compensated for this void by establishing author funds in the hope that this would encourage faculty to publish in open access journals. Demonstrating the dramatic rise of open access journals and efforts by libraries to support them, the number of established author funds in universities rose from seventeen in 2011 to fifty-five in 2014 (Scholarly Publishing and Academic Resources Coalition 2011, 2014).

While the specifics of each author fund vary subtly by institution—with relevant factors including the total pool of money, the source of funding, reimbursement eligibility requirements, and cap levels on a per-article basis—the overall approach is largely similar. The university operates a total annual allotment of funds (often in the range of \$25,000 to \$50,000) and reimburses authors for the cost of publishing within the limits of a cap after a manuscript passes the peer review process. Article processing charges range from several hundred dollars to upward of five thousand dollars. Recognizing the limitations of finite resources, it is necessary to determine parameters for the author fund to optimize impact in accordance with the library’s objective. Requiring an understanding of the fund’s objective, be it to change faculty publishing habits or to increase the amount of scholarship that is freely available, knowing the issues that are important to the library is essential in devising a well-tailored policy.

A crucial component of establishing an author fund is evaluating whether the service is fulfilling its objective and receiving a return on investment. If the objective is marketing and incentivizing faculty to publish in open access journals, then success may be determined based on the number of faculty who are aided by the author fund. If the objective is to provide the public with access to meaningful research, then a library may need to be selective in deciding which articles receive funding, judging them on merit and anticipated value to scholarship in the field. Altmetrics can be used to analyze the impact of articles supported by an author fund and thus its overall success in funding worthwhile research, but doing so requires time for the significance of articles to be adequately determined.

Questioning the value of today's saturated cache of research, Barbara Fister (2015) contends that the "publish or perish" model within academia incentivizes faculty to publish frantically for the benefit of job security: "Why does everyone have to publish so much? Are we really advancing knowledge, or is this some weirdly inflated reputational currency that is running out of control? I'm not saying we should quit doing research, but maybe we should be a little more selective about what we feel needs to be part of the record." Historically, it was assumed that the peer review process and the expert critical analysis accorded to each article provided the necessary verification of the value of an author's research. At times, however, the publishing industry—an increasingly lucrative business—is undermining the integrity of the peer review process in an effort to improve profits. While it is perhaps impractical for librarians to assess the merit of research prior to funding, it behooves them to be discerning in evaluating which requests will be funded based on a quantitative analysis of the accepting journal's ranking and influence.

Increased demand from researchers for their publications to be readily and freely available has fostered an environment allowing for the proliferation of open access journals in the marketplace. By the law of supply and demand, publishers have responded by increasing the opportunities for authors to make their work available through open access. Seeking a sustainable business model for open access journals, many publishers adopted article processing charges to address the costs associated with the peer review process. Inevitably, the prospect of financial gain attracted parties willing to exploit individuals' eagerness to publish in open access journals. Termed predatory publishers, these "low quality, fly by night operations" behave contrary to the core mission of academic publishers to disseminate knowledge and "exist for the sole purpose of profit" (Berger and Cirasella 2015, 132). Predatory publishers increased 31 percent from 2014 to 2015, for a total of 693 predatory publishers (Beall 2015).

Article processing charges and the pursuit of profit are not themselves indicators of predatory publishing. Often the process for determining the

merit of a journal and the legitimacy of a publisher's intentions is not well delineated. The Committee on Publication Ethics has identified a code of conduct for publishers enumerating criteria related to transparency, editorial independence, appreciation for the role of peer review, and clear communication of policy (Committee on Publication Ethics n.d.).

Predatory publishers are a single contributor to an evolving malaise within the publishing industry. The pursuit of financial gain, including "fast-tracking" the extensive and slow peer review process for parties who are willing to pay, runs contrary to the traditional objective of publishers to guarantee the integrity of research. John Bohannon, an editor for *Scientific Reports*, resigned in public protest over expedited peer review, arguing that "it sets up a two-tiered system and instead of the best science being published in a timely fashion it will further shift the balance to well-funded labs and groups" (Bohannon 2015). Expedited peer review is symptomatic of a trend by which profit is prioritized above advancing scholarship.

Criticism of diluted publishing standards extends beyond the well-exposed practices of predatory publishers and is not exclusive to open access journals. In his article *Does Peer Review Do More Harm than Good?* Luc Rinaldi (2015) quotes psychology professor Alex Holcombe of the University of Sydney on the controversial and hazardous practice of fast-tracking: "What appears in scientific journals is determined not by money, but rather the merit of the actual science. . . . [F]ast-tracking is a formula for taking shortcuts—such tight timelines may force reviewers and editors to make decisions without proper scrutiny." Researchers are too often willing to pay this cost in order to add an additional publication to their curriculum vitae.

Librarians are discovering that demand from faculty authors for financial support to publish in open access journals frequently exceeds the funds available. While this imbalance signifies the successful proliferation of the open access movement in academia, it also mandates that librarians judiciously assess the purposes and objectives of their author funds; consider which university constituents are eligible to receive funding; establish the source of funds and how much money each author is permitted to apply for; determine which publishers and journals are approved for reimbursement; and establish who within the library is responsible for promoting the service throughout the university. Sustainability of the author fund demands not only a careful analysis of the program's objectives and parameters prior to implementation but also the flexibility to reevaluate them on a continuing basis.

APPRAISING ALTERNATIVE STRATEGIES FOR FUNDING
OPEN ACCESS: A METHODOLOGY FOR LOWERING
THE COST STRUCTURE ASSOCIATED WITH THE
“PAY TO PUBLISH” MODEL

Establishing the extent of author funding is essential for ensuring that the impact of investment in open access is maximized. Formulating a policy and refining current arrangements, while vital to the sustainability of an author fund, is only a single strategy designed to maximize potential. Many proponents of open access argue that, rather than conforming to the business model implemented by publishers and financing article processing charges, libraries should proactively partner with other institutions in order to reduce prices in the marketplace. Libraries have implemented a pair of notable strategies to diminish pay-to-publish costs: the development of consortia and using institutional membership subscriptions as leverage to negotiate discounted costs.

Strategies to reduce the costs of open access publishing, including institutional memberships with publishers and consortium discounts, endeavor to minimize article processing charges. Institutional memberships operate as agreements between a university and a publisher in which the institution pays a fixed annual cost, predetermined by the size of the institution and the anticipated number of submitted articles, and authors affiliated with the university receive a discounted rate on the article processing charge to make their work available through open access.

While this sort of arrangement presents immediate benefits to the publisher and the university by reducing administrative costs, there are concerns that providing selective preference to larger publishers at the expense of smaller companies could reduce competition in the marketplace over the long term. According to the Open Access Scholarly Publishers Association,

membership schemes that are based on up-front commitments for a university to publish a particular volume of content with a given publisher can potentially reduce competition within the Open Access ecosystem, making it difficult for smaller publishers to compete on a level playing field with larger publishers, who are inherently better positioned to negotiate individual deals with universities. (Sutton 2013)

Consortium membership offers economic advantages by providing members increased leverage to negotiate terms. Promoting standardization and equal access to resources for a broad coalition of members reduces costs for authors. Strengthened bargaining power allows the consortium to advance user rights beyond the abilities of an individual library. Collective bargaining improves return on investment for each member of a consortium and equalizes access to resources for smaller partners. A collection of libraries in the University of Colorado system proved both the economic and qualitative

benefits of a cooperative arrangement when they recorded a return on investment of 715 percent for Auraria (the consortium's smaller partner) and 56 percent for Boulder (Pan and Fong 2010, 191).

Using a model of collective bargaining and encompassing three thousand libraries from forty-two countries, SCOAP³ centralizes the payment to publishers of article processing charges for the open access dissemination of particle physics research (Sponsoring Consortium for Open Access Publishing in Particle Physics 2015). SCOAP³ notes its mission and benefits: "The SCOAP³ vision for tomorrow is that funding bodies and libraries worldwide would federate in a consortium that will pay centrally for the peer-review and other editorial services, through a re-direction of funds currently used for journal subscriptions, and, as a consequence, articles will be free to read for everyone" (Gentil-Beccot, Mele, and Vigen 2010, 45). Although far from a panacea, institutional memberships and consortia provide libraries additional resources to support open access journals, lowering the costs of article processing charges and improving efficiency.

CONCLUSION

Although widely supported by proponents, open access journals are not without their detractors. Misgivings about open access journals focus in part on the unsustainability of the author-pay model. With a limited percentage of researchers supported by grant funding to publish in open access journals, questions as to where the necessary funding will originate are of concern, and libraries are challenged to address these financial demands with reduced budgets. Without a significant shift to a greater proportion of research being available open access, libraries are in the unenviable position of supporting access to research through reimbursement of article processing charges while continuing to pay exorbitant subscription prices. Libraries must consider that, although some open access journals require the payment of article processing charges, many others do not. According to the *Directory of Open Access Journals*, though "nearly two-thirds of OA journals . . . do not charge authors, a recent study indicates that 50% of OA articles have been published after the author paid a fee" (Fruin and Rascoe 2014, 240). Despite opportunities to publish in open access journals without cost, researchers continue to submit to journals that charge author fees for reasons related to prestige and impact factor.

Given the value of supporting open access journals by establishing author funds, institutions cannot view their actions as insulated from the decisions of other universities. Assessing the benefits of an author fund requires determining the rates of article processing charges and such charges are contingent on the state of the publishing marketplace. As the rates of article pro-

cessing charges rise, the economic burdens increasingly exceed the benefits. When a university acts unilaterally, the cost of open access can outweigh the benefits; only once aggressive support for open access publishing in lieu of subscriptions is ubiquitous in the research community will the full benefits be realized. Uniform, worldwide adoption would represent significant savings for universities if the current average article processing charges remain consistent at an average of \$906. However, “[u]niversities adopting an all ‘gold’ mode of publishing their research results when the rest of the research community retain the current model (a mix of open access and subscription publishing) would find costs outweighing benefits in all cases” (Swan and Houghton 2012, 13). For open access journals to supplant the subscription model, all libraries must make a concerted effort to shift the approach they take to supporting scholarly publishing.

NOTES

1. For example, the digital divide in the United States creates a dichotomy by which “35 percent of schools across the nation still lack access to fiber networks capable of delivering the advanced broadband required to support today’s digital-learning tools” (Federal Communications Commission 2015). For those lacking the technological infrastructure necessary to utilize the Internet for access to information, a barrier is created that inhibits growth.

2. “Colleges and universities are the primary performers of basic research, with the federal government being the largest funding source. In FY2008, the federal government provided approximately 60% of an estimated \$51.9 billion of research and development funds expended by academic institutions” (Matthews 2012).

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