

Open access and academic reputation

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Open access aims to make knowledge freely available to those who would make use of it. High-profile open access journals, such as those published by PLoS (Public Library of Science), have been able to demonstrate the viability of this model for increasing an author's reach and reputation within scholarly communication through the use of such bibliographic tools as the Journal Impact Factor, conceived and developed by Eugene Garfield. This article considers the various approaches that authors, journals, and funding agencies are taking toward open access, as well as its effect on reputation for authors and, more widely, for journals and the research enterprise itself.

While others wrestle with how to best establish authority, reliability, and trustworthiness within online business environments, I will speak to the academic equivalent, by observing that the honing of the review-and-recommendation management of reputations has been a focus of academic life for many centuries. Academic life has always been subject to patronage, whether of the court, church, academies, universities, or the state¹. Scholarly patrons trade in reputations, by investing in the reputation of scholars (as well as artists, musicians and poets) and seeking, by way of return on investment, an enhancement of their own reputation. The scholarly community has a claim, then, to being part of the original *reputation society*^a. And *reputation* is precisely the asset or value that scholars have to offer, whether on

the faculty job market or a journal's editorial board, as an expert witness, or as a reference for a colleague. And what Eugene Garfield brought to this was, indeed, a *science* of information reputation and authority, by which such qualities could be measured and had to be earned year after year. That scholarly communication is being digitally transformed calls for a rethinking of the circulation of knowledge, gives us pause to reconsider reputation, as well as Dr. Garfield's lasting contribution, in light of the new openness that the internet is making possible.

The university contracts, in effect, to "rent" scholars' reputations for the duration of their careers^b. In addition, the university provides faculty with incentives to increase their reputational assets, as part of what Partha Dasgupta and Paul A. David term "the collegiate reputation-based reward system"². This academic form of life can be said to be underwritten by a reputation economy. To borrow from the classic definition of economics, reputation in academic life controls the production, distribution, and consumption of this public good known as research and scholarship.

One would think that scholars and universities, having long trafficked in finely calibrated measures of reputation, should have little trouble navigating this new digital realm—a realm that is staking its future on "the distributed formation of reputations, and consequently increased ability to distinguish better from worse," as Hassan Masum and Yi-Cheng Zhang describe in their "Manifesto for the Reputation Society"³. Yet for all of the academy's experience with reputation management, it is the Internet that has radically altered the *distribution* side of this

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- a. To give the briefest taste of that history, the German philosopher-administrator Johann Justi wrote in 1760 of how "in the Republic of Letters, the academic ware is publicly vendued for money. I mean 'academic money' there. One needs to know that the Republic of Letters mints a sort of coin called 'fame.' In the learned tongue, this minting means to cite someone else with much credit."¹⁸ A further historic indication of just how much reputation matters to academic life is found in Robert K. Merton's observation of "the great frequency with which the history of science is punctuated by disputes, often sordid, over priority of discovery"¹⁹.
 - b. In a classic study on "communication" as the "essence of science," William D. Garvey refers to the "complex matter of institutional pride," in which an institution's "continued healthy existence depends on acknowledged scientific productivity" to attract outstanding scientists, good students, and the support of funding agencies²⁰.

economy, enabling a research article to reach far beyond the circulation figures of any given print subscription and approach universal access, otherwise known as “open access.”⁴ Current debates about the viability of open access, as a distribution principle for scholarly communication, reveal tensions between the interests of researchers and publishers. Notwithstanding these tensions, open access holds considerable promise for improving the standing, or reputation, of research and scholarship more broadly.

I do not mean to imply, with this chapter’s emphasis on reputation, that scholars are unduly self-interested or egomaniacal in their work. It is rather that reputation serves as the currency within the republic of letters, determining the work’s exchange value. Given the technical and highly specialized nature of academic work, and its integral relationship to a body of work, most people (even within the academy) are not able to evaluate a contribution on its own terms, although they may well be able to learn from it.

Those who work within the academy become very skilled at judging the stuff of reputations. Where has the person’s work been published, what claims of priority in discovery have they established, how often have they been cited, how and where reviewed, what prizes won, what institutional titles earned, what organizations led? Even the blind review process — designed to ensure that the selection of articles is not susceptible to the influence of past achievements — ensures the reputational currency of both journal and author. Yet academic reputation also involves a person’s degree of generosity with colleagues, and their mentorship of students and junior faculty. It includes their spirit of collaboration and openness with data and methods, and their helpfulness in reviewing, refereeing, and editing, along with all the other forms of support and leadership that the scholar provides.

The question I consider here is the impact of open access in relation to questions of researchers’ reputations^c. The initial reaction to the realization that research could freely circulate through open access was to dismiss any such

work, and anyone associated with it, as lacking credibility. During the 1990s, it was common enough to hear faculty members say that, while they were fine with it all, their colleagues (especially their colleagues on tenure and promotion committees) would judge it as reputation-damaging to post work online, publish in journals that appeared online, or otherwise step outside of the print tradition in any sort of digital fashion. This stance had a bemusing double twist to it, as it held that not only did placing work online reduce its (reputational) value to zero, it was then likely to be stolen as well.

Yet for all of these conservative attitudes within the academy, the majority of journals moved online with the dawning of the twenty-first century, just as the majority of researchers soon favored online access to these materials over visiting library stacks to photocopy or make notes on index cards from copies of print journals. As the academic community began to realize not only the convenience of online access but its potential for circulating work worldwide, scholarly publishers sought to transpose the print subscription business model to the Internet in the belief that the circulation of academic work would continue to be restricted to subscribers—and that subscription price increases, with a slight “print-plus-online” boost, would continue unabated into the new century.

A number of researchers saw the Internet differently. Beginning in the 1990s, they began to post their work, making it freely available before, during, and after it was published, in a form that has become known as *author self-archiving*. Other researchers experimented with new forms of open access publishing that managed to align researcher interests in providing universal access to their work and the value (both reputational and in terms of improving the article) of having work peer reviewed, leading to the publication of *open access journals*^d. These two approaches involved a minority of researchers. For most faculty members, it is fair to say that the digital era has changed little except the ease with which they access the literature, and the speed with which they correspond with colleagues and journals. This may yet change, for reasons that have to do with the nature of this reputation economy that depends on how widely one’s work is read and cited. It is thus worthwhile understanding

c. Parallel developments in the openness afforded by the Web include open source software²¹ and the open data movement²², both of which draw on the reputational aspect of academic—and professional, in the case of open source software—life.

d. See, for example, the Directory of Open Access Journals (doaj.org).

how open access has already affected academic practices.

To take a leading instance of a field transformed by the digital era, scientists working in high energy physics began in the 1990s to place early drafts and published versions of their work online, thanks to the initiative of the far-sighted physicist Paul Ginsparg. In this repository, papers could be freely shared in what has since become arXiv.org. They continued to send their research articles to *Physics Letters* or *Physical Review*, where it was peer reviewed and published, but only after the work had been circulating for months, if not years, in arXiv.org.

With physicists logging into arXiv.org each day to see what is new and current in their field, rather than turning to the journals, they are dealing directly with the unregulated literature, which in principle may include anything from a Nobel Prize breakthrough to a perpetual-motion proposal. The paper they are reading may have yet to be submitted to a journal, or it may be currently under review at a journal, or it may have been accepted or published in a physics journal. It is just as likely to be in all four states, in that order, with the progress noted in different iterations of the article that is uploaded to arXiv.org. ArXiv.org is now used by several disciplines in addition to physics, and holds in excess of half-a-million papers across physics, math, nonlinear science, computer science, computational biology, quantitative finance and statistics.

So what has happened to the physics journals as a result of so much of the field's literature being available earlier and free online? The publishers report no decrease in subscriptions over the first decade or so that arXiv.org has been in operation^e. The journals still play an important role in authorizing and distinguishing the quality of papers for the physics community, but this aspect of the reputation economy is now largely disengaged from the circulation and direct utilization of this knowledge by physicists. That is, the journals are still contributing to

reputation-making and, as such, are being used for tenure, promotion, and merit-pay purpose, at most once a year when reputation is cashed in. But for the daily work of these physicists, the currency, speed, and universality of access provided by arXiv.org outweighs the screening and authority value of the leading journals. They would rather search through it all, and make their own calls. The popularity of arXiv.org among researchers has generated the paradigmatic paradox that besets scholarly communication today: the journal remains indispensable for institutional reputation-setting, even as, in a number of fields, it is no longer the principal point of knowledge exchange and circulation for those who actually produce and consume the research at issue^f.

In a clear sign of a market in transition between publishing mediums, university libraries find that they have to subscribe to certain academic journals mainly to sustain the peer-review and editorial judgment that is provided by the author's colleagues in the field. The economic inefficiencies are further exacerbated by commercial publishers running up journal prices to the point where their titles are many times more expensive than the much higher ranked journals published by scholarly societies, as has been documented by Ted Bergstrom for journals in the field of economics⁶. This misalignment between reputation-value and price had already taken hold during the latter half of the twentieth century, as Bergstrom's work shows.

What this new publishing medium offers is a chance to explore new models that recognize, for example, how researcher interests in universal distribution and access can run contrary to traditional publisher business models that are based on restricting access to journal content. It needs to be recalled that the intellectual property at issue in this reputation economy is a sponsored public good, which may distinguish it from the intellectual property

e. The average price is still among the highest for any discipline, costing libraries well over \$3,252 annually, although this represents all of physics²³, with the price increases in this field exceeding 350% from 1990 to 2009, roughly the period during which arXiv.org has become a major source of papers for physicists in a number of areas²⁴.

f. Furthering their innovative approach to scholarly communication, the particle physics community has launched an experiment by the name of SCOAP3 (Sponsoring Consortium for Open Access Publishing in Particle Physics), which seeks to affect "a global conversion of the main corpus of [particle physics] journals to the open access model"²⁵. The group has calculated that with a \$15 million payment to publishers, open access to the entire field of particle physics could be purchased, which is less than is being paid by libraries in total subscription fees for the six relevant journals in which over 80% of this literature appears²⁶.

marketed by large publishing houses or record labels (in which restricting access to the property can be in the interest of both author/musician and publisher).

The reputation of research as a public good was something recognized by those researchers who posted published versions of their work online. Many journal publishers have, as a concession to the open-access movement, instituted “author self-archiving policies.” These policies offer a trade-off, by restricting authors to posting their final draft (following peer review), and among some publishers, only 12 months after publication. (This second-class status for archived copies has become, in turn, the standard for the National Institutes of Health’s Public Access Policy required of all research published as a result of its considerable grants program.)

Meanwhile, interest in archiving grows among faculty members. As a result, some 40 departments – and, in some cases, entire institutions – have instituted open access policies in which faculty have agreed to make sure everything they publish is immediately posted in an open access archive, if only in a draft version^g. Archiving is augmenting the reputation of research, as a body of work that is increasingly open, public, and universally available.

When it comes to the open access journals, the case for reputation has been made by the Public Library of Science (PLoS). Directed by leading scientists, PLoS set out to establish that publishing with an open access journal did not have to cost anyone their reputation. They attracted funding that made it possible to publish on a very professional basis, while charging authors to publish their work, following the “page charges” model that had long been used by subscription journals to supplement their finances (where articles beyond a certain length cost the author an additional charge per page). PLoS has gone on to publish seven journals, but what it established, almost from the beginning, is that open access is changing the reputation dynamics of journal publishing.

Within two years of its launch, *PLoS Biology* was able to achieve the highest Journal Impact Factor in the field

of biology⁷. It thus took advantage of the leading print measure of prestige to lay to rest the reputation question of this new medium and this open access approach to sharing knowledge. Given its importance as a standard measure in the otherwise difficult to quantify area of reputation, the Journal Impact Factor (JIF) is found in the Journal Citation Reports prepared by the ISI Web of Science, and is based on the average number of citations per article in a journal over a two-year period. It was originally developed by Eugene Garfield in 1961 to help with the selection of leading journals for Institute of Information citation index⁸. It is today the most widely regarded measure of journal influence and thus reputation. Although Dr. Garfield is the first to admit its limits as a measure, it is again proving to be invaluable tool, this time in helping to guide scholarly communication through the radical transformation of the publishing medium with a considerable increase resulting in access to and the circulation of knowledge.

A new subscription journal, similar to *PLoS Biology*, would not have been able to attract the necessary subscriptions from hard-pressed libraries and thus the readership needed to have an influence and impact. With open access, *PLoS Biology* was immediately open to being discovered through search engines such as Google Scholar almost immediately on publication and not long afterwards in indexes such as PubMed and ISI Web of Science by readers interested in the topics covered. *PLoS Biology* subsequently dropped its print edition, further demonstrating how far we have come from less than a decade ago, when the common advice to young faculty members was to stay away from electronic journals. Even among the most traditional of subscription journals, open access is having an influence – the highly-ranked *New England Journal of Medicine* now makes much of its content free online six months after it has been published and circulated among subscribers.

To gain a sense of what archiving or publishing one’s work in an open access format can do for a researcher’s reputation, one would do well to consult the annotated bibliography maintained by Steve Hitchcock⁹. It lists the studies that delve into the impact of open access by examining the difference it makes to how often a work is read and cited, as a result of it being made freely available online. To take but one of many examples, Gunther Eysenbach’s study of the *Proceedings of the*

g. See ROARMAP (Registry of Open Access Repository Material Archiving Policies) www.eprints.org/openaccess/policysignup/

National Academy of Sciences found that those articles that were made open access within the Proceedings were twice as likely to be cited in the first 4-10 months after publication, with that ratio rising to almost three times as likely by 10-16 months after publication¹⁰.

On the other hand, Philip Davis et al. failed to find a citational advantage for open access articles in the first 12 months in an extensive study of the biomedical field, but still revealed an increased readership for work using this new approach, suggesting that reputations might well have been affected¹¹. Studies have found that the impact of providing open access to articles differs across fields, with it being far lower in philosophy compared to political science¹². Other studies have found increased use of open access articles (whether archived by their authors or published in open access journals) in developing countries, with well over twice the usage in Chile and Bulgaria, and somewhat greater than that in Brazil and Turkey¹³.

This open access advantage, in terms of one's work attracting more citations than it would if the work had not been made open access, is a "limited time offer" to researchers who archive their work and publish in open access journals. As funding agencies such as the Wellcome Trust and the National Institutes of Health as well as institutions such as Harvard and Stanford pass policies in support of open access, there will come a point where open access to research and scholarship is commonplace.

By that point, I would speculate that the advantages of this greater accessibility will translate into an improved reputation for research as a whole. Research will play a greater role among professionals, policy-makers and interested members of the public (including Wikipedians). Signs of this interest in research are already emerging with the whole "evidence-based" movement in medicine and health¹⁴, and policy making in general¹⁵, as well as with the educational focus on undergraduate research¹⁶. Whether this enhancement of research's public reputation will translate into greater public support at all levels for research and scholarship can only be a hope at this point.

Certainly, one of the things that open access affords is the building of researcher reputations on a global scale, especially for researchers who previously had no

reputation. The work of the Public Knowledge Project, which I am involved with, has provided journals in developing countries with an open source (free) means of publishing their journals online. This allows the journals' contents to become suddenly and globally "visible," enabling it to show up in Google Scholar search pages alongside other better-known work on the same topic. This level of visibility simply wasn't afforded by print, given limits in both subscriptions and indexing. But appearing on the same search result page is only part of this shift. Participating in the global research culture, and having universal access to its literature, is bound to help spread common research standards—something the Public Knowledge Project tries to support, by using software to structure peer-review, indexing, and other journal conventions^h.

It is common to hear concerns expressed over the proliferation of research, as if somehow curtailing the global pursuit of knowledge in order to simplify one's own inquiry were a good thing. However, as the Web grows, so do innovations for dealing with this ever-expanding body of information. Foremost among them are freely available search engines that allow one to sort through and find more of exactly what one is looking for. The U.S. government, for example, provides PubMed (life sciences) and ERIC (education). In searching through these services, one can privilege journal articles over other materials, but still be made aware of related materials by the same author. This enhances an individual's ability to judge for themselves the quality of research, or at the very least, the reputation of the author. Google Scholar takes this a step further, allowing for a ready check of how often a work has been cited, by whom, and in what context.

Open access extends rather than derails the academy's reputation economy, opening up the literature to a wider and more global population. Eugene Garfield, through his work with the Journal Citation Index, succeeded in providing a check on reputation, forcing journals, for example, to continue to earn their claims to having a large impact, rather than resting on their laurels¹⁷. These

h. The Public Knowledge Project's software, Open Journal Systems, is used by approximately 1,500 journals in developing countries (pkp.sfu.ca). It works in conjunction with the International Network for the Availability of Scientific Publications, which engages in the training of editors and the establishing of regional journal hosting and indexing services.

two aspects – found both in the openness of the literature and in the search for discriminating measures – add up to the larger reputation of the scholarly field as a different sort of marketplace, namely one of ideas. The academic pursuit of knowledge relies on this exhaustive and risky openness, something which open access only adds to, while Garfield's last legacy provides one invaluable means of navigating within this next stage in the historic opening of science and research.

Certainly, risks abound and discernment is necessary, as we experiment with digital capacities for a greater sharing of knowledge. This new publishing medium is no less susceptible to deception and duplicity than has been the case with printⁱ. Nor is it yet clear, this early into the history of the new medium, how scholarly publishers (who still retain ownership over the better part of this knowledge) are going to protect, if not continue to increase, their revenue streams in ways that do not conspicuously sacrifice the interests of scholars in seeing their work circulate as widely as possible.

Open access to research and scholarship is being achieved through a variety of means, as authors, journals, publishers, and funding agencies find new of using this digital medium to extend the reach and reputation of published work. While it still too early in this digital era to identify the full extent of this transformation of business models for scholarly communication, what can be concluded at this point is that the academic community will continue to exploit the Internet as the latest in a long series of technical developments that have been employed to advance the circulation of knowledge as a public good. As no less a part of that history, these scholarly activities will continue to be underwritten by the reputational economy of public and private patronage, and it is my belief that all of this bodes well for both the public and global aspects of sharing learning and knowledge.

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i. As I write, there is news of a scientist fabricating data²⁷, a dubious open access publisher being tricked into publishing a fake article²⁸, and a highly respected subscription publisher being caught issuing fake journals sponsored by a pharmaceutical corporation²⁹.

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