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Rejoinder to Open Access: The Whipping Boy for Problems in Scholarly Publishing

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Abstract:

This is a commentary as part of the debate on Open Access.

Keywords:

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1   Introduction

In their paper, Kingsley and Kennan (2015) analyze arguments against open access publishing ("that open access publishers are predatory, that open access is too expensive, and that open access paper deposits in repositories will bring about the end of scholarly publishing") as identifying problems with scholarly publishing in general as opposed to being arguments against open access in particular. They then identify issues that they believe are still in need of debate (monographs, how to manage paper processing charges, how to improve institutional repositories, how to make scholarly publishing inclusive, and how to fix the reward system).

While I mostly agree with Kingsley and Kennan's arguments, I think the argument would benefit from more systematically analyzing the current system of scholarly publishing to understand why and how the system is changing and what might be blocking other changes. In this rejoinder, I present such an analysis.

2   Theory

As a framework for this analysis, I draw on Kling, McKim, and King's (2003) framing of the system of scholarly communication as a socio-technical interaction network (STIN). A STIN is "a network that includes people (including organizations), equipment, data, diverse resources (money, skill, status), documents and messages, legal arrangements and enforcement mechanisms and resource flows" (Kling et al., 2003, p. 48). The relations among elements of the network can include social, economic, and political interaction. To map a system as a STIN requires identifying the people involved (or excluded), their communication fora and resource flows, and their incentives for participation. Finally, there may be choices of systems architecture that map to features of the STIN, making different configurations of technology and systems more or less compatible, viable, or sustainable.

Applying this perspective, Kling et al. (2003) emphasize that journals and other scholarly communications venues do not function independently but rather are part of a larger system. For example, the majority of journals survive because of authors' incentives that derive from the universities that employ them rather than from the journals themselves. Indeed, journals depend largely on voluntary contributions of papers, editorial work, and reviews. Kling et al.'s analysis of the arXiv.org system, a large and successful preprint collection primarily in the physical and mathematical sciences, show how its success depends in part on its relation to a network of other services, such as the Stanford Public Information Retrieval System—High Energy Physics (SPIRES-HEP) bibliographic database (Robbins, 2007) and cataloguing work done by the Deutsches Elektronen Synchrotron (DESY) library staff. arXiv.org complemented these efforts by providing access to the full text of some papers. The absence of a similar well-used infrastructure for cataloguing and organizing in other fields arguably makes it harder for preprint collections to take hold elsewhere.

3   Analysis

As a basis for making informed design suggestions, I start by assessing the current system of scholarly communications in information systems. An implication of Kling et al.'s (2003) model is that the institutional details of the system matter, so we focus on the system surrounding information systems in particular. Following the STIN model, we first identify the people and organizations involved and their interests and motivations, the resource flows among the actors, and the current functions of technological support.

3.1   People and Organizations

Addressing the first point, we can identify at least six sets of actors involved in scholarly communications around information systems. Although there is substantial overlap in the composition of some of these groups, we separate them here as they serve distinct roles in the system.

1   **Authors:** the first group are researchers with results to share and who we refer to as authors. In the case of information systems, these are primarily university faculty concerned with publishing their research findings to establish their own reputations and careers, which are based to varying degrees on the volume and quality of publications. Indeed, a common complaint about

contemporary scholarly communication is that the goal of getting published has replaced the goal of communicating.

2 **Employers:** the second group are the administrators at the universities or research centres that employ the authors. They are concerned with the reputation of their institutions and how it is enhanced by the authors' publications. For example, in the United Kingdom, academic departments are regularly assessed based on the publications of the department's members, and these assessments have serious implications for funding. The link in other countries is less explicit but no less real. Moreover, administrators and faculty evaluation committees use individual publication records as a basis for assessment for hiring, compensation, promotion, or tenure.

3 **Editors and reviewers:** the third group are editors and reviewers who act as gatekeepers for publication and who are nearly always drawn from the same community of researchers as authors. Editors and reviewers are generally paid only a nominal fee (if at all) by the publishers to whom they contribute. The motivation for participation is instead a mix of interest in the topic, a desire to shape the field, and generalized reciprocity (reviewing in return for getting reviews). Editors may gain further rewards from employers for taking on visible leadership roles in the community.

4 **Publishers:** the fourth group are the academic publishers, a mix of for-profit companies and learned societies. To support costs of publishing requires a revenue stream. As a basis for this revenue, publishers need scholarly publications and an interested audience willing to buy access to them.

5 **Libraries:** the fifth group are the academic libraries. Libraries are important to the system for two reasons. First, libraries often act as an intermediary between publishers and readers by buying published works and making them available to affiliated readers. Few could afford to subscribe to the full range of potentially relevant journals found in an academic library. Second, libraries historically perform the function of archiving scholarly works to preserve access and cooperate among themselves to make this work to the research community more broadly accessible (e.g., through inter-library loan agreements).

6 **Readers:** the final group are the intended consumers of the research outputs; namely, those who might be interested in the research results. In the current system of scholarly publishing, readers are nearly always other researchers who are interested in tracking the development of a research area to inform their own research. The increased specialization of science and the emphasis on novelty of research findings means that research results are generally incomprehensible to the general reader (Osburn, 1984). Furthermore, most scholarly communications venues emphasize the novelty of research findings (vs. utility or integration), again with an orientation toward a researcher audience.

3.2 Flows

Having identified actors and motives, we next identify major flows of resources among them (see Figure 1 for graphical representation). First, research results, mostly in the form of research papers, flow from authors to publishers to readers. In scholarly communications in university settings, this flow is typically via libraries. In some cases, readers may obtain papers directly from authors (e.g., on request, through informal circulation, or via an institutional repository, which the dashed line shows). Second, payment for the publications (i.e., subscription fees) flows from readers (or more commonly, their libraries) to publishers. Note publishers do not typically pay authors in scholarly communications. Indeed, in some cases, sometimes but not exclusively for OA, page fees flow from authors to publishers. Finally, employers support and reward authors (based at least in part on their success in publishing) as well as editors and reviewers.
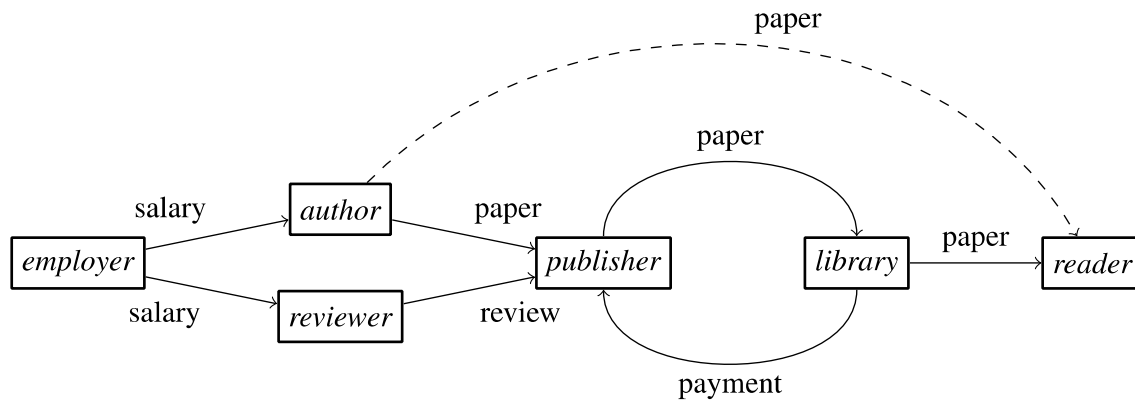
Figure 1. The Network of Scholarly Communications

3.3   System Architecture

We here consider the "systems architecture" of scholarly communication and how it may serve the interests we identify above. To do so, we first identify the functions served by scholarly communication and map these to individual interests and to the particular communications fora that comprise the system of scholarly communications. Rowland (2002, p. 1) state that "four main functions of the scholarly literature are dissemination of current knowledge, archiving of the canonical knowledge base, quality control of published information, and assignment of priority and credit for their work to authors".

We see that Rowland (2002) stresses the function of disseminating finished research results. However, to fully understand the functions of scholarly communications, we must go beyond just focusing on work outputs. We draw here on Hackman's (1987) team model, which states that a work system, in addition to producing valued outputs, must also ensure that the individual needs of those in the system are satisfied to keep them involved. In part, this satisfaction can come from employment, but. to keep authors, reviewers and readers involved in the information systems community also requires feedback and support from the community. An additional important outcome is that the community as a whole continues to function, which requires the maintenance of the personal relations on which community is founded. Thus, we can identify the following functions of the scholarly communications system:

1. Disseminating research results to interested readers.
2. Archiving findings for future access.
3. Ensuring the quality of disseminated or archived findings.
4. Assigning priority and giving credit for findings to authors.
5. Providing feedback and encouragement to authors.
6. Supporting and developing the research community.

One can see the first three functions as serving readers' interests by allowing them to keep current on findings and to access quality results. Function four serves authors' interests and indirectly the institutions that employ them, while function five helps the authors to develop their research. Finally, function six indirectly helps all members who benefit from interactions with others.

These functions are served by a diverse set of scholarly communications venues. Journals serve the functions of filtering and disseminating papers. The editorial process filters papers to ensure quality and also provide feedback to authors through the review process (Rowland, 2002). Conferences and workshops also play an important role in disseminating results and providing feedback. The focus above has been on creators of knowledge, the authors, but the STIN perspective suggests considering the other end of the flow. For example, authors want to disseminate knowledge, but readers then have the problem of locating relevant works. Archiving of research findings implies requiring the ability to search and retrieve from archives. Improving work by obtaining feedback implies the need to consider the motives for individual reviewers and editors to provide that feedback.

4   Tensions and Contradictions

To understand how the system of scholarly communications might evolve, I first examine various tensions in the current system that might serve as drivers for change. Second, I examine how the technological affordances of the Internet contradict underlying assumptions about the system for scholarly communications.

First, some tensions are inherent in the conflict between the various functions of the system, which have different metrics for evaluation. For example, to best disseminate current knowledge and establish priority, results should be recorded quickly and disseminated broadly. On the other hand, to achieve results' quality before dissemination and archiving implies the need for selectivity to be sure results are noteworthy. However, the needed quality control process slows down or even blocks dissemination.

As a result, tensions arise when a single venue attempts to achieve conflicting functions. For example, conferences potentially face a conflict if they simultaneously adopt the functions of ensuring findings' quality and of supporting and developing the research community. To achieve the first function suggests that a conference should be highly selective and accept and publish only the best papers submitted. The second function suggests that a conference should strive to bring members of the community together to interact and develop ties that will sustain the community and perhaps lead to future collaborations. These functions can conflict because conferences require travel funding and the policies of many universities requires that an author have a paper accepted to be funded. Therefore, a highly selective conference will lose potential attendees, which will hamper the function of community development. Potentially worse, after several rounds of rejections, potential community members may conclude that their efforts should be directed to a more welcoming community[1].

Furthermore, publishing a proceedings, necessary for disseminating archiving research results, has several possibly undesirable implications for authors' motives. First, a paper published in a proceedings generally needs to be revised before it can be published in a journal. Since many employers give more weight in evaluations to journal publications and little or none to conference papers, having an excellent paper appear as a conference publication may be undesirable. Second, the time required to prepare a conference proceedings interferes with disseminating findings in a timely manner. Finally, if the proceedings are restricted to conference attendees and subscribers, presented papers may in fact hardly be disseminated at all, which is a concern if the conference organization gave up other functions in order to achieve dissemination.

The International Conference on Information Systems (ICIS) provides an example of one approach, with an acceptance rate of around 25 percent and a published proceedings available on a website only to AIS members. ICIS is intended to be a premier conference that accepts only the best papers, but, given the limited distribution, the conference cannot really be said to be disseminating or archiving results. (Ironically, older proceedings printed on paper or in the ACM Digital Library may be more accessible as many have been added to library collections.) ICIS does host many ancillary meetings that provide the other functions, such as feedback to authors and community maintenance, and, arguably, these are functions that are best provided in such smaller, more focused venues. A counter example is the *Academy of Management Conference (AoM)*, which has an acceptance rate of about 50 percent. *AoM* does not view the conference as an archival publication: indeed, only a select few papers are included in the Best Papers Proceeding, which is distributed to attendees but not otherwise archived. The conference is rather viewed as an opportunity to develop ideas and the community. Interestingly, *AoM* has no separate ancillary meetings: specialized meetings can be built in to the main program of the conference (e.g., in the form of professional development workshops).

Of course, tensions can also arise in venues that are highly non-selective, such as workshops. A workshop should be a vehicle for providing feedback and encouragement to authors, but, if it includes many short presentations, it is impossible for authors to get much feedback, and, if papers are on too diverse a set of topics, the audience will have difficulty staying engaged.

Finally, some tensions arise when a venue brings together actors with competing motivations. For example, journals are often collaborations between for-profit publishers and scholars. To support their operations, the publishers need to sell subscriptions to the journal, which requires restricting access to the papers. This restriction is enforced by having authors give the paper's copyright to the journal. However,

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[1] A point made by Jonathan Grudin (private communication)

restricting access conflicts with the authors' motive to make an impact by having their work better known to the point where it is not uncommon for authors to subvert publishers by posting their copyright papers on their own websites (i.e., green OA). Even the *AIS*, a non-profit supposedly acting in the interest of its members, restricts access to its self-published journals, *Journal of the AIS* and *Communications of the AIS*, to be able to sell copies and memberships. Recent years of *JAIS* are available through online databases such as *ABI/Inform*, but previous years seem to be available only to *AIS* members and direct subscribers. As such, papers published in these journals are less available to researchers in other fields and to practitioners, a policy that seems counter to the interests of the individual authors and, indeed, likely to suppress the impact of IS research overall. A counter-example is the open access *Journal of Computer-Mediated Communications.* In part due to its open availability, it is widely read and cited: for example, while JCMC has published about 2.5 times as many papers as *JAIS,* a search in ISI Web of Science turns up nearly six times as many citations. More generally, Eysenbach (2006) found that open access papers were two to three times more likely to be cited and are cited more quickly and more often. However, R&R raise the interesting point that changing the revenue source for a journal from subscribers to authors eliminates the tension noted above, but having both author and publisher seek to publish may reduce the publisher's commitment to ensuring publication quality.

Second, I consider contradictions created by the affordances of the Internet. As I note above, in this paper, I suggest how new modes of publishing can fit the system of scholarly publishing. The Internet is important because it enables new modes of access to information, which makes it easier to access and distribute information. As a result, contradictions have emerged to the assumptions built-in to the current system based on difficulty of access or the cost of distributions. However, the STIN analysis makes it clear that we should not think about simple substitution of technologies (e.g., a website for a newsletter) but consider the effects of the changed access on the whole network and on actors' particular motivations.

A first change is in the simple cost of publishing. Prior to the Internet, widely disseminating research papers required printing and mailing, which were expensive and complex procedures requiring considerable expertise and capital investment in printing technology. The Internet has made dissemination at least nearly free, though expertise is still required in editing, text production, and assignment of meta-data for access. Overall, though, achieving dissemination no longer requires traditional publication (as with the online AIS journals). In addition to the rise of Internet-only journals, many traditional journals now provide Web access to papers, at least for subscribers, and take advantage of email's low cost to send tables of contents to alert readers to new works. This approach offers many conveniences for subscribers, who can access papers more quickly.

Search engines and paper databases have impacted publishing as much or more than online distribution. Using searches to locate papers as part of a literature review process means that readers can find papers without having to regularly read particular journals. The result is that researchers can be informed by a much wider range of papers than by reading paper publications and, at least in terms of accessibility, there is no special advantage to publishing in top journals (as long as the journal is indexed). As a result, the proportion of high-impact papers comes from an increasingly diverse set of outlets (Acharya et al., 2014), diminishing the importance of the "elite" journals. Further reducing the special role of journals, search engines such as Google Scholar and Citeseer index papers from a broad range of sources, including journals, conferences, workshops, paper repositories (e.g., the *AIS Sprouts Working Papers* repository, http://sprouts.aisnet.org/), and even personal webpages. The indexing that Kling, McKim, and King (2003) note was important for the success of ArXiv and is, thus, more widely available. As a result, authors now have increasing choices for disseminating their results. Indeed, the low cost of publishing enables researchers to return to self-publishing if they choose (e.g., maintaining a research blog with one's latest results or using a system like Sprouts, ArXiv or an institutional repository as a main dissemination mechanism).

On the other hand, electronic distribution negatively impacts other functions of the system of scholarly communications. For example, a shift to electronic distribution complicates libraries' ability to archive journals. Indeed, in many case, access is lost if the subscription is not renewed, which directly contradicts archiving's function. Furthermore, licensing restrictions on electronic publications may limit libraries' ability to share documents via ILL, further hampering the ability to disseminate and preserve knowledge.

A second change is in the cost of storage. When archiving involved paper, libraries faced substantial costs in space and employees to catalogue and store volumes of journals. As a result, archiving implied the need to filter content to assess what was worth keeping and what was not. However, if papers are digital, storage is cheap, which suggests that filtering is less critical. The online journal PLOSOne for example,

filters papers only for correctness, not for significance[2]. On the other hand, the cost of readers' time has not changed, nor has the cost of cataloguing. The question then is how reader can identify what is worth reading and to learn about relevant new work without becoming overloaded. One possibility is to develop new forms of review to help identify interesting work, such as the systems used to rate papers and comments on websites such as SlashDot (http://slashdot.org/). However, the STIN analysis raises the question of the motivations for authors, editors, and reviewers to participate in such systems.

A final change is in publishing's flexibility. The limitations of ink on paper limited scholarly communications to text and simple graphics (usually black and white). The cost of ink and paper led to limitations on page lengths for papers. However, a shift to digital publishing with its ability to distribute machine-readable formats and its large publishing space invites people to consider scholarly communication through the full range of the scholarly process—theorizing, collecting data, analyzing data, and presenting results. As a result, journals can now include "new units of scholarly communication" (Van de Sompel, Payette, Erickson, Lagoze, & Warner, 2004), such as datasets, compound documents, instruments, and analysis approaches. However, the STIN analysis suggests the need to work on motives for sharing such documents to examine their ties to the scholarly reward system. Tenure committees understand how to evaluate journal papers but may have more difficulty when faced with a published data set or computer program.

5   What Does This Analysis Tell Us About Open Access?

Finally, to analyze how open access might grow in the system of scholarly communications, I consider why different actors might resist open access by considering, in turn, the functions of the scholarly publication system I develop above.

5.1   Authors

Authors might not want to publish in an OA journal for many reasons. Indeed, OA potentially affects most of the functions of scholarly publishing identified above. First, authors might be concerned that an OA journal will not succeed in disseminating research results to interested readers (e.g., because readers will not read the paper). I discuss this concern in more detail below. Second, authors might be concerned that the journal will not succeed in archiving findings for future access (e.g., because the journal will go out of business and the archives will be lost). To assuage this concern, OA journals should make clear their archiving strategy (e.g., arrangements with a reputable institution that will guarantee future access). Third, authors might be concerned that the journal will not succeed in ensuring the quality of disseminated or archived findings or in providing feedback and encouragement to authors (e.g., if the review process is perfunctory). As Kingsley and Kennan (2015) note, this concern is not unique to OA but applies to other kinds of journals as well. Developing guidance for authors that identifies reputable journals could assuage this concern. Finally, authors might worry that an OA journal will not succeed in giving credit for findings to authors if such a publication were not favorably evaluated by their employers or others. I also address this concern below. The concerns discussed above do not seem to apply to the case of green OA. The main barrier here is that extra effort is required to deposit an accepted paper.

5.2   Readers

As I note above, some authors may be concerned that readers will not read their papers if they are in OA journals, but few if any of the concerns I note for authors would seem to deter readers. Rather, readers face the problem of learning about relevant new work and identifying what is worth reading. It may be that readers do not read OA journals regularly, but this problem is mitigated by observing that researchers increasingly search for papers in databases rather than expecting to find them in a few journals. However, a paper will be hard to find if it does not appear in the relevant databases, which may pose a problem for a new journal (OA or not) or for an institutional repository. Even if the OA papers does come up in a search, readers may filter it out as likely not of high quality if it is from an unfamiliar journal (again, OA or not). This problem can be addressed by the same kinds of guidance about reputable journals that would be useful to authors (and, indeed, authors and readers are likely drawn from the same population). Overall, though, the evidence I note above about the higher citation rate for OA papers suggests that the concern about a lack of readership for OA journals is misplaced.

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[2] See http://www.plosone.org/static/publish.

5.3   Employers

As Kingsley and Kennan (2015) and I note, authors are often concerned that their employers might not reward them for publishing in an OA journal. Indeed, employers often use journal title as a proxy for paper quality despite the obvious flaws in this approach, so a paper in an unfamiliar journal may receive little credit (OA or not, though OA journals may face a particular burden). As Kingsley and Kennan note, the real solution is to encourage evaluators to employ more direct measures of publication impact. Guidance about reputable journals and evidence about their quality may also help in assessing an unfamiliar publication. However, such guidance will not be helpful if the evaluators have elected to rely on constrained list of journal titles (e.g., the basket of 8 or FT45 list of journals). On the other hand, employers could greatly encourage green OA by mandating that their employees deposit their published papers to address the main barrier to this approach that I note above.

5.4   Other Roles

Considering the other roles suggests few additional barriers for OA. For publishers, OA is a new business model, but it is possible to profit either way, and, indeed, many for-profit publishers have created OA journals (as Kingsley and Kennan (2015) note). Libraries seem likely to favor OA if it leads to the availability of new resources with no additional subscription costs, though, as Kingsley and Kennan note, it does not directly address the rise in the cost of subscriptions. Libraries could potentially be concerned about their role in transferring knowledge shrinking, but their skills are still relevant, so there will continue to be a need for their involvement. For example, libraries are likely to be involved in developing and running an institutional repository for green OA and may even take on the work of depositing papers by authors at their institution.

6   Conclusion

In conclusion, I offer recommendations based on the above analysis to further the adoption of open access. First, the IS field needs a list of reputable OA journals to guide authors, readers, and employers. Authors should be encouraged to consider OA journals for their publications and to self-deposit non-OA publications. Those who evaluate research should acknowledge the evidence that high-impact research is increasingly found outside of a limited set of journals and so discard their flawed reliance on journal title as a proxy for research impact. Publishers, non-profits such as AIS in particular, could take the lead by making their journals open access. Finally, the administrators of OA journals and institutional repositories need to ensure that the contents of their repositories are easily searched and broadly indexed to make them available to interested readers.

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