Could a New Cross-listed Method of Journal Article Publication Fuel a Growth of New Interdisciplinary Research and Teams?

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Abstract

Researchers may avoid taking on interdisciplinary projects due to concern that publications outside of their own field will not be rewarded in their home departments. We propose that journal parent publishers facilitate "cross-listed" journal publications where papers can be submitted to and peer-reviewed simultaneously by two journals, in different fields, with joint publication under a single DOI.

1. Introduction

There are many scientific and social benefits to interdisciplinary research. Such research, which spans disciplinary silos, is suitable for addressing broad questions and can potentially have impact on multiple fields. While there have been calls for more financial support for interdisciplinary research for many years (e.g. Metzger and Zare, 1999; Kane, 1999) funding agencies and universities have increasingly recognized these benefits in recent years and have encouraged the formation of interdisciplinary research teams. Indeed, some researchers, such as Buyalskaya et al. (2021), claim that we are currently in a "golden age of social science" with interdisciplinary endeavors and opportunities, though they also indicate that there are hurdles that such work faces. One hurdle is that the publication potential of interdisciplinary research may stifle the formation of interdisciplinary research teams. The co-authors that make up an interdisciplinary team typically have different home departments. These departments quite understandably place disproportionate weight on publications within their own disciplines. This matters greatly for tenure and career advancement and can create conflicts within teams when they decide which journals to pursue. Junior faculty or postdoctoral scholars may be dissuaded from pursuing interdisciplinary work until such time as tenure provides them job protection or achieving the rank of Full Professor is assured (see Baker, 2024, for a personal account). Some high-potential research that could be conducted would not be undertaken, contributing to the trend of decreasing "disruptiveness" of science over time (Park et al. 2023). In this article, we propose and describe a simple solution to this problem: **the cross-listing of journal publications in multiple journals** who share the review process.

2. The Problem

The presence of elite, interdisciplinary, general-interest journals that span multiple fields of science (such as *Nature*, *Science*, the *Proceedings of the National Academic of Science,* etc.) helps the right tail of very high-impact interdisciplinary research find a home that is recognized across disciplines. The

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interdisciplinary nature of these elite journals also means that they are organized to identify peer-reviewers who can span the research areas of an article stemming from an interdisciplinary research effort. However, only a small fraction of interdisciplinary studies will ever find itself in those journals given their low acceptance rates and exacting standards. We are concerned here with the bulk of interdisciplinary research conducted, which makes a valuable contribution to science but is unlikely to achieve publication in elite outlets. For such articles, interdisciplinary teams must choose the discipline whose journals they target.

Targeting single discipline journals with interdisciplinary work leads to three potential hazards. The first is that a single discipline journal will typically engage a set of peer-reviewers who are experts in the field of the target journal. Part of the reason for this is that researchers decline to referee for journals outside their discipline because they may consider writing a report for a journal that they would not be rewarded for publishing in to be a poor use of their time. For example, consider a research team made up of neuroscientists and economists who have a paper that explores a research question that bridges neuroscience and economics. If such a paper is sent to an economics journal, it would naturally most likely be peer-reviewed by a group of researchers who are principally evaluating the research from the perspective of economics. If the same paper were sent to a top neuroscience journal instead, it would most likely be peer-reviewed through the lens of neuroscience. While this is what one should properly expect from the journal's perspective given its readership, it can distort the focus and emphasis of the paper away from the authors' original intent and may leave half of the science insufficiently peer-reviewed. To be evaluated on its own terms, the content of interdisciplinary research requires peer-review from each of the disciplines represented in the scientific process. Neuroscience reviewers are not specialized in evaluating the nuances of the economics side of the science and vice versa. Upon publication in a single discipline journal, the research will likely be disproportionately visible to and cited by researchers from that discipline and its contribution to the other discipline may be lost.

The second problem concerns career incentives (Berkes et al. 2024). Sending research to single discipline journals means publishing outside of journals that are recognized, valued, and rewarded by the home departments of any co-authors outside of the journal's field. This makes it difficult for those co-authors to clearly provide evidence of their contributions to their own field and to be appropriately rewarded for those contributions. Junior faculty at most universities are expected to be developing a reputation within their own fields and even high-quality publications outside of their home fields do not help to demonstrate this reputation formation. Under the current academic system, this imperative clashes with the objective of advancing interdisciplinary research. Indeed, the Berkes study indicated that research survival rates of newly minted biomedical PhD students were dramatically shorter for heavily interdisciplinary researchers compared to modestly interdisciplinary researchers.

Third, if the eventual publication outlet of most interdisciplinary work is a single discipline journal, the co-authors from outside of the "primary" field may not be fully invested in the scientific process and instead simply focus upon the narrow slice of the project most related to their own field (a strategy that requires less of a research time investment). The opportunity cost for these non-primary-field co-authors researchers is work on other projects within their own fields and is thus relatively high. They may prefer to be involved in large groups rather than small groups which would naturally require deeper involvement by each co-author. This mentality may be partially responsible for the phenomenon of large interdisciplinary team sizes. Science as a whole, however, may suffer from this phenomenon as studies by small teams are suspected to generate more disruptive science and novel ideas that delve more deeply

into topics while studies by large teams are thought to more fully develop pre-existing ideas. This idea is explored using a large data set of over 40 million published articles by Wu et al. (2019), who also find that the citations for small teams' work tends to be delayed while large teams receive their citations relatively quickly. These problems intensify the lack of incentive for junior researchers to engage in small interdisciplinary teams as the tenure clock disproportionately favors rapid citation accumulation.

3. The Cross-listing Solution

A common practice at universities when advertising their courses to students, the cross-listing of courses across fields of study, can be adapted by journals and their publishers to help solve the problem. Courses that overlap in content from multiple disciplines are often cross-listed so that students in different majors can take the course simultaneously, while each student receives credit for taking a course within the department of their own major. Why not apply a similar concept to the publication process? Since the publishers of most scientific journals already host websites, receive submissions, and process payments for journals in many fields, they could also facilitate "cross-listed" journal publications from interdisciplinary research teams. The process could be relatively simple:

- Interdisciplinary teams could submit their papers jointly to two journals that are in different fields but that have the same parent publisher. In most cases this would be possible given the landscape of the academic publishing industry, which has several large players whose journals span many disciplines.[3]
- An editor at each journal would then be responsible for one half of the peer-review process.
- Each editor would send the paper out to external referees within their discipline or could desk reject the paper. Authors would have the option to commit at the time of submission to withdrawal from both journals in response to a desk rejection from one of the journals. If one editor desk rejects, the editor of the other journal is notified that a desk rejection occurred. The paper may remain under review at the other journal at the discretion of that editor and the decision of the authors at the time of submission. We expect, however, that in most cases, editors will wait to see if the other editor desk rejects before sending the paper to reviewers.
- After the two independent peer-review processes are completed, if both editors agree that the paper is publishable, the paper could be published as is conventionally done, but posted online under one DOI to which both journals separately link. All acceptances are conditional until a final decision is made at both journals. Revisions could go back to the referees at both journals at the discretion of the editors.[4]

[3] The programs used for processing submissions, such as Editorial Manager or Scholar One, would have to be modified to allow joint submission. Our experience leads us to believe that this is feasible since forwarding from one journal to another already is enabled with these software packages and workflows can be readily adjusted in these programs.

[4] There is a scenario that merits special comment. Consider a situation in which one journal has conditionally accepted a paper while demanding no more revisions, while the second journal has asked for revisions that would materially change the paper from the current version accepted at the first journal. There is a risk that such revision would change the paper so much that it might be rejected at the first journal. In such a case, the author may withdraw the paper from the second journal, effectively guaranteeing acceptance at the first journal. Alternatively, they can revise the paper for the second journal and risk losing the ability to publish at the first journal. We anticipate that in such a situation, the editors would coordinate and jointly determine the best way forward for the paper.

- If only one journal recommends that the paper be published (for instance if a paper is rejected or withdrawn from one of the journals) the handling editor at the remaining journal could be free to invite the authors to proceed with the paper as a non-cross-listed paper. That process could involve seeking further external reviews if the editor desires.

Since it is now common for many journals to not have print editions at all (or have at least some online only papers), these cross-listed publications would not be appearing in multiple separate printed materials and thus not be confused as being two separate publications. Cross-listed articles would not appear in print editions.

4. Benefits of Cross listing

This proposed solution addresses many concerns for the parties involved in the academic research and publication process. Some of the main advantages for the various stakeholders are:

For authors

- It connects authors of interdisciplinary work to the multiple audiences that the work is intended for.
- Including multiple disciplinary journal homes in the evaluation process provides academic departments a clear way to evaluate publications for promotion and tenure purposes.
- Cross-listing will help build a common language (called a "lingua franca" by Buyalskaya et al., 2021) between fields as researchers in different fields will increasingly be reading the same papers and exposed to the same scientific "jargon".

For editors[5]

- Linking to multiple journals would be expected to increase the overall visibility, reach, and citations of research papers as the readership of each of the linked journals is likely to be very different.
- Journals with interdisciplinary focus would be expected get more citations and therefore have higher impact factors.
- Editors can confine their attention to recruiting reviewers and interpreting referee reports within their own discipline. This allows the editors to concentrate their attention on areas that they know well and in which they can make more informed decisions.

For publishers[6]

[5] Some editors might be concerned about a dilution of perceived quality of their journal if one of its articles were to be cross-listed with a lower-ranked journal in another field. This is not a concern here, in our view. An editor can always reject the paper and the fact that the journal was submitted to a lower-ranked journal in another field might be valuable information to an editor in judging its quality. Anticipation of this stigma is a natural disincentive to authors and deters researchers from engaging in the strategy of submitting to one journal of high quality and one of low quality.

[6] Some readers might surmise that cross-listing would favor large publishing companies who publish across fields over society journals who self-publish such as the American Economic Association in economics. While it is easiest for publishers to implement cross-listing within their own journal portfolio, there is no reason in principle why an independent journal could not enter into an agreement with a larger publisher to implement a cross-listing scheme.

- Both journals get full credit for a citation to a cross-listed article and a boost to their respective impact factors.
- For the article itself, a single DOI and a joint citation that lists both journals in a "Journal A/Journal B" style would help prevent double counting and would facilitate easy citation and tracking of its downloads.
- The process does not require the creation of new journals or hiring of specialized interdisciplinary staff. It would require at most only relatively minor changes in journal infrastructure.

For the scientific community

- The dual review process strengthens the rigor of the scientific evaluation process through peer review in multiple fields rather than one.
- The dual review process maintains the ability for the individual fields (via their journals) to independently vet research.
- A cross-listed publication provides a simple and transparent signal to the research community that the paper is a quality contribution in each of the research fields. A standard single-discipline journal publication would continue to provide a signal to the research community that the paper is a quality contribution in the research field of that journal.
- Cross-linked publications facilitate the spread of common information between fields and help tear down the silo walls that discourage discussions between fields.
- The increased willingness of researchers to conduct interdisciplinary research may help reverse the trend of decreasing "disruptiveness" of research over time (Park et al., 2023 and Kozlov, 2023) and may increase the prevalence of small interdisciplinary research teams (Wu et al., 2019).

Overall, the proposed solution of cross-listing journal publications creates a more incentive compatible process for authors, departments, journals, and publishers to evaluate and spread interdisciplinary research. Additionally, this solution may help increase research quality, improve the review process, and facilitate the increased participation of junior (non-tenured) researchers in interdisciplinary research endeavors in a relatively low-cost manner.

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Declarations

1. Competing interests: This article addresses interdisciplinary research and publication, which are parts of our own careers/employment as academic scholars.

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3. Ethical approval: Not Applicable

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