When Charity is Outrage: The Benefits and Pitfalls of Incentivized Peer Review

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Abstract

Peer review remains the standard method to vet scholarly work and to assess their suitability for publication in academic journals. As the debate about the effectiveness of peer review has taken center stage, it has pushed the peer reviewers out of the limelight. In this article, the authors take a look at the various endeavors undertaken to incentivize the process of peer review. This gives rise to another debate, whether peer review should be incentivized at all, and if it is, then what is the most appropriate method. This article mentions the emerging trends of "pay for peer review" and the moral and ethical implications of this method. The authors also provide possible processes in which a journal, supported by an academic or professional body, may undertake the issue of incentivizing the largely anonymous and un-credited work of peer reviewers who remain the sentinels of the world of published evidence.

> *Dear Sir,*
> *We (Mr. Rosen and I) had sent you our manuscript for publication and had not authorized you to show it to specialists before it is printed. I see no reason to address the—in any case erroneous—comments of your anonymous expert. On the basis of this incident I prefer to publish the paper elsewhere.*
>
> *Respectfully,*
> *Albert Einstein*

The letter quoted above was authored by Albert Einstein, who was evidently miffed by a critical review received by his work titled "Do gravitational waves exist?" by an anonymous referee for the journal Physical Review, edited by John Tate. Subsequently, Albert Einstein withdrew his work through this letter dated 27th July, 1936. Interestingly, he went on to publish the article in the Journal of the Franklin Institute (Philadelphia), and the published version was, supposedly, vastly different from the version that was originally submitted to Physical Review. The incident that had outraged Einstein is a pretty standard practice in today's scholarly publication system and it is unthinkable in today's world that any scientist today would share in Einstein's outrage at having their work refereed.

(http://scitation.aip.org/content/aip/magazine/physicstoday/article/58/9/10.1063/1.2117822)

The process of refereeing submissions to academic journals, also known as peer review, has been the subject of much criticism of late, and despite doubts being cast over its efficiency and effectiveness, has remained as the method of choice for most academic publishers. Medical Essays and Observations, published by the Royal Society of Edinburgh in 1731, is widely considered to be the first peer reviewed publication, and since then, publication ethics and review systems have become more robust and exact. However, in the discourse around the best way to do peer review, the unheard voice is that of the peer reviewer, the heart and soul of the system. Only recently have the issues around incentives for peer review come up in academic discourses.
(Benos DJ, Bashari E, Chaves JM, Gaggar A, Kapoor N, LaFrance M, et al. The ups and downs of peer review. Adv Physiol Educ. 2007;31:145–152. doi: 10.1152/advan.00104.2006.)

In September 2014, a group of over 40 Australian scientists submitted a petition, titled "Journal reviewing and editing: Institutional support is necessary" (http://exchanges.wiley.com/blog/2015/01/07/recognition-for-peer-review-and-editing-in-australia-and-beyond/) submitted to draw the attention of multiple agencies leading Australian science and research. The petition urged these organizations to take note of reviewing and editing work conducted by the academics. The thrust was to incorporate these activities into the mainstream of academic assessment through the recognition of such work by the universities, granting agencies, or research organizations. While the issues raised were vital and central to the argument that peer review is a thankless job done by an anonymous crowd, it stopped short of offering concrete solutions aside from institutional recognition for those involved in peer review. Considering the wide spectrum of journals a peer reviewer may work for, both from the point of view of quality and quantity, the challenge, then, is how to devise a method for uniform accreditation, based on the merit of the work being done by the reviewer.

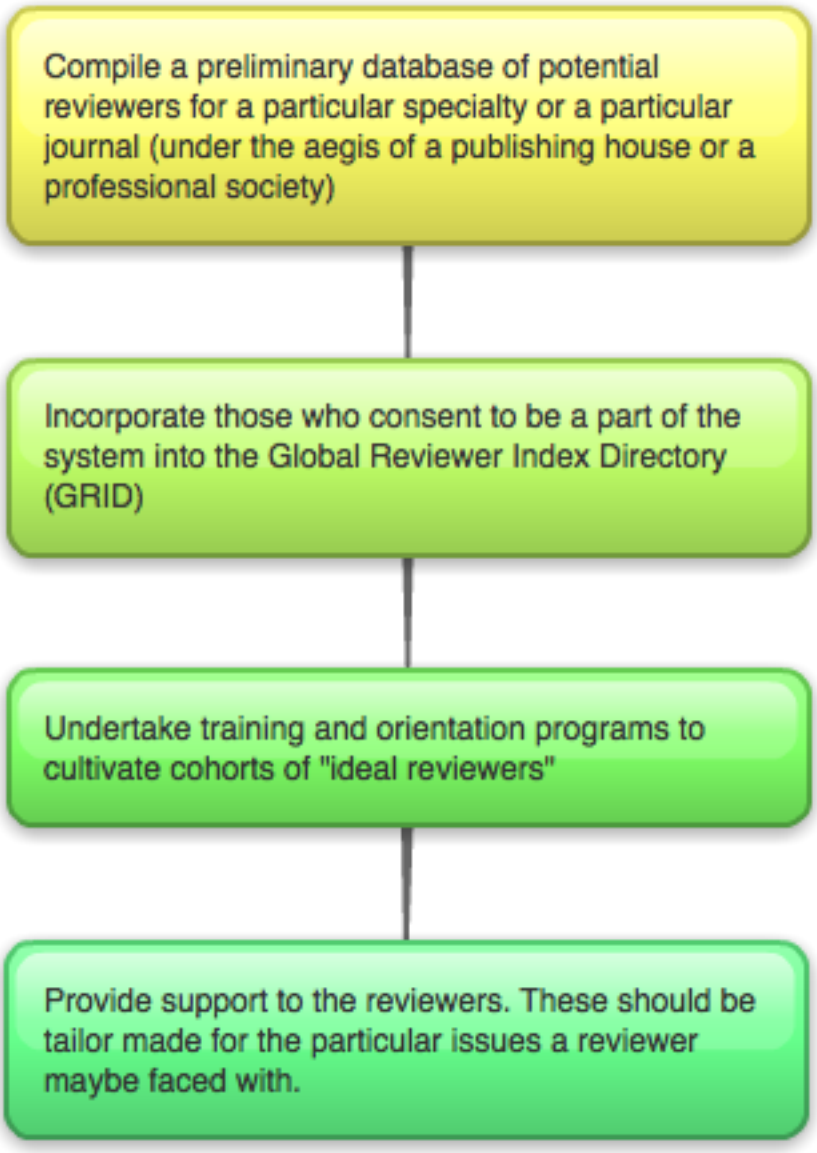
The most obvious alternative that comes up whenever the issue of incentivizing peer review is discussed is a financial solution – monetary remuneration for peer review work. For example, Collabra (http://wschg.com/new/2014/12/23/collabra.org/redirect), a new, online, open access journal, has proposed a point-based system from which the reviewers, senior editors and handling editors will be paid in accordance with their involvement with the publication process. The journal proposes to charge $875 as author processing charges, of which $250 shall be deposited in a "research community fund", from which the payments shall be made to peer reviewers.
(http://news.sciencemag.org/scientific-community/2015/01/new-open-access-journal-plans-pay-peer-reviewers)

However, before any further discussions on incentives for peer review can take place, another critical and much debated issue needs to be resolved: whether to make peer review an open process or keep the reviewers and authors blinded to each others' identity. With strong arguments on both sides of the chasm, this is a debate that has split the publishing academia wide apart. Some studies show open peer review results

in better, more detailed reviews, although there seems to be a trend towards more frequent favorable recommendations causing some to express reservations about the validity of open review.
(http://www.ncbi.nlm.nih.gov/pubmed/10789326?dopt=Abstract)

Some authors have feared retribution for negative reviews, especially when the peer reviewer is a junior member of a discipline who recommends that a senior, and influential peer's paper be rejected. This fear of reprisals can be especially strong when the junior researchers' livelihood depends on grant collaborations, which may require the approval of the rejected author or their extended network.
(http://www.jpgmonline.com/article.asp?issn=0022-3859;year=2006;volume=52;issue=4;spage=325;epage=325;aulast=Choi)
There are valid concerns in cultural settings where hierarchies are based on seniority or on primacy of a professional relationship in addressing patient care.
(http://www.nejm.org/doi/full/10.1056/NEJMp1212410) A culture of "medical disrespect" has also been viewed with growing concern in the western medical systems, where the hierarchical compartmentalization is mitigated by a singular commitment to patient care and quality research. There are concerns that malignant medical hierarchies that condone disrespect or bullying of juniors are prone to medical errors and as such the same culture could infiltrate the reviewing of scientific manuscripts. (http://blogs.scientificamerican.com/unofficial-prognosis/2014/01/29/disrespect-in-hospitals-isnt-just-unpleasant-its-unsafe/ and http://aeon.co/magazine/health/why-rude-doctors-make-bad-doctors/) Thus, these are real fears that make a lot of junior peer reviewers uncomfortable when asked to participate in an open review system. The conundrum remains, because, it has been clearly identified that without opening up the review system, it would be difficult to identify the peer reviewers' contributions and credit them for it. Alternatively, a system of "masked review" maybe conceived, where the reviewer gets an online alter ego, who benefits from the review credits accruing through time. However, this would mean considerable increase in editorial and journal workload, which are considered to be weighed down with mindless minutiae.
(http://www.ncbi.nlm.nih.gov/pubmed/12038905?dopt=Abstract)

Some authors have advocated for a rather complicated four-step reviewer crediting system utilizing the quality and quantity of review work done by peer reviewers.
(http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3653227/) The model proposed by them Kachewar and Sankaye has the following components:



Compile a preliminary database of potential reviewers for a particular journal or for a specialty either under the aegis of a publishing house or a professional body → Incorporate those who consent to be peer reviewers into a database, the Global Reviewer Index Directory → Undertake a brief training and orientation program to cultivate cohorts of ideal reviewers → Provide support tailor-made to the specific demands.

Based on the quality of their reviews, the reviewers would be rated using a uniform criterion ascertained a priori. A Reviewer Index could be calculated to ascertain appropriate credit and recognition to their work. An assertion that the index does not take into account any measure of "quality" of the review work done, but the inherent assumption is that a poor reviewer will not be asked to review too many papers, therefore, naturally limiting the number of credits they can gain.

Taking this same type of incentive forward, some authors have proposed a radical alternative: a correction factor for the h-index, which will "allow for the inclusion of peer-review effort in the evaluation of the outputs produced by an academic." While it is undeniable that multiple good reviews can improve the quality of research papers,

at the same time, introducing another index to an already over-populated quality assurance system seems unlikely to augment anything except bureaucracy (http://www.ncbi.nlm.nih.gov/pubmed/23932409)

One of the most widely recognized fashion in which peer review has been incentivized is by providing CME credits to the reviewers for submission of timely and helpful reviews. For over a decade now, leading medical journals like JAMA, NEJM and Annals of Internal Medicine have been providing accredited CME points to the reviewers. (De Gregory J. Medical journals start granting CME credit for peer review. Science Editor. 2004;27:190–191.) However, how such incentives impact reviewer behavior has not been studied. In general, peer review is one of those fields where the published literature carries a lot of strong opinions and little in terms of hard evidence. (http://www.sciencemag.org/content/341/6152/1331) The field has proven resistant to experimental excursions mainly because the journal editors tend to avoid experimentation with their systems.

Until and unless we understand what motivates an academic to undertake the responsibilities of peer review, any system to set about incentivizing the process would be fatally flawed. To that end, it is crucial to understand what factors modulate reviewer behaviors. A study published in an economics journal, undertaken by its Editor in Chief, looked at this exact question. (https://www.aeaweb.org/articles.php?doi=10.1257/jep.28.3.169)
Reviewers for the Journal of Economic Perspectives (which is published by the American Economic Association) were split into four groups:

a. A control group assigned six weeks to submit a review
b. A group with a four week deadline
c. A cash incentive group which was awarded $100 for meeting the four week deadline
d. A social incentive group where the reviewers were told that their turnaround times would be published alongside the article

The study revealed that shorter deadlines reduced turnover time for reviews. The cash incentives significantly improved the speed of submitting reviews, especially in the last week of the deadline. However, after the cash incentives were withdrawn, these reviewers maintained parity with the 4-week deadline group, suggesting some residual behavioral modification. Interestingly, tenured professors were more likely to respond to the social incentive rather than the deadlines or monetary incentive. These incentives did not significantly alter review quality and agreement between investigated reviewers and editorial board members was excellent.

Further enquiry into the nature of peer reviewer motivations has led to interesting insights. In a survey to ascertain why peer reviewers decline opportunities to review (http://jech.bmj.com/content/61/1/9) workload came out to be the primary factor. So, naturally, when the question is to incentivize the process of peer review, it means that the incentives should be enticing enough to tilt the balance. The question remains, whether to achieve this balance through incentives in cash or kind or of a social norm!

An interesting study, involving the effect of informal rewards on the productivity of Wikipedia peer producers revealed that a token, informal reward system, based on barn stars, increased productivity by 60%.

(http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3315525/) Considering that academic refereeing is a similar onerous, and apparently thankless job, this provides some evidence that providing incentives, even in the form of informal, token rewards, leads to reinforcement of positive behavioral traits, causing enhanced productivity.

Though patchy and of questionable external validity and generalizability, there seems to be some evidence that points to the fact that cash incentives may work. At the same time, there is a strong contingent that believes that providing material rewards to reviewers for the peer review work is a repugnant alternative. Contrary to the findings of the above study, other investigators have found that provision of material rewards for review work actually led to a deterioration of quality of submitted reviews. (http://www.sciencedirect.com/science/article/pii/S0048733312001230)

Although it appears counter intuitive at first blush, it is quite understandable once the principles of behavioral economics is applied. When reviews are completed without a cash incentive, academics feel that they are giving back to the scholarly world from which they have benefited. However, when a monetary tag is applied to the work, it becomes a fiscal transaction and until and unless the remuneration is at par with the employment benefits one already enjoys, it is unlikely to result in personal or professional satisfaction. Thus, peer review work when undertaken as an "academic activity" is more likely to result in higher quality output than when undertaken as a "financial transaction". This seems to agree with Maslow's classic hierarchy of needs where peer reviewing could be viewed as a method to fulfill self-actualization or esteem needs and in this climate providing financial incentives may disrupt or de-incentivize reviewers.

Other authors have taken a transactional look at the peer review crisis. (http://www.esajournals.org/doi/full/10.1890/0012-9623-91.3.325) They suggest that since reviewing is a thankless, invisible job, the market force is skewed towards submitting research work as authors and rather than being a reviewer. To relieve this stress, a system of credit allocation can be done, which is, in essence, tantamount to "privatization" of the process of peer review. Here, authors have to pay for obtaining the service of peer review. This payment could be in the form of surrogate currency (called PubCreds by these authors), which is earned through the undertaking of review work, in turn, by the authors themselves. A similar model has been adopted by the radical, low cost, open access journal PeerJ, which allows lifetime publication for rates as low as 99$, on the condition that the submitting authors are registered in the system and are ready to undertake their fair share of review work.

Using these principles of incentivized peer review, for profit endeavors have sprung up, like Rubriq (http://www.rubriq.com/why/our-mission/) and Peerage of Science (https://www.peerageofscience.org/how-it-works/) that leverage the fact that authors may be willing to pay for peer review if it results in a smoother decision workflow once the paper is submitted to a journal. In fact, these organizations may be considered to be agencies where one can outsource peer review services. However, these approaches are riddled with the risk of perversion of the course of scientific discourse and conflicts of interest, taking it out of the social and academic norm into a purely financial and business norm. In addition, a certain sense of being an "academic mercenary" may be associated with such models, which may be repugnant to many. Also, the fact that these are "for-payment" services will naturally skew the number of

beneficiaries. Those authors that need such peer assistance will also be the most unlikely to be able to raise the considerable amount of funding required to access such services. In addition, the fact that the extra cost of publication will be palmed off on the researchers, thereby worsens an already fund-starved system, and weakens the rubric for successful survival.

A major controversy sprung up when Scientific Reports, Nature Publishing Group's open access endeavor announced a partnership with Rubriq to offer submitting authors an option to have expedited peer review, with a result within 3 weeks in lieu of a payment of 750$ charge. The peer reviewers are supposedly paid 100$ to turn in a "scorecard"-based review within the stipulated time. (http://links.information.nature.com/servlet/MailView?ms=NDgyOTU3OTAS1&r=MTMzNDk2Mzk5MDM5S0&j=NjQzMDQ3NjY2S0&mt=1&rt=0) However, this little pilot project ran into a major hurdle when one of the editors of the journal, Professor Mark Maslin, a Biogeographer at the University College London, very publicly denounced this model. Professor Maslin took to Twitter to announce his resignation from the journal, and the reason for the same, bringing the issue to the cynosure of all eyes in social media. (http://news.sciencemag.org/scientific-community/2015/03/editor-quits-journal-over-pay-expedited-peer-review-offer) Rubriq had apparently pulled in a staggering 20 million US$ in revenue in the last year by employing this process of paid peer review.

Professor Maslin's stand actually represents the logic that has fractured the academic world on this matter. The pay-for-review system is bound to encourage a "two-tiered system" which further favors well funded researchers and laboratories, while restricting publication routes for the less affluent researchers. One of the problems that Open Access publication based on author processing fees has faced is the steep publication charges, which may run into thousands of dollars. By further adding to the publication charges with expedited peer review for pay, researchers from the developing world and less well-off laboratories and institutions are further alienated from the mainstream of academic publications.

Traditionally, the term "peer review" has been applied to pre-publication reviews and post-publication review remains a virtually unexplored terrain. Pre-publication peer review has had its share of criticism, as a system that does not work as well as it is believed to be. The Sokal affair (http://www.physics.nyu.edu/sokal/lingua_franca_v4/lingua_franca_v4.html) made the academic world realize the value of peer reviewers who are independent from the editorial board of the journal or of the interests of a journal, who can assess and advise the editorial board appropriately. While this established the need for peer review, John Bohannon's "sting operation" showed that monetization of the process of academic publication (through the author-payment model) has led to a massive perversion of the course of peer review, especially in case of what Jeffrey Beall has labeled as "predatory open access" journals. (http://www.sciencemag.org/content/342/6154/60.full and http://en.wikipedia.org/wiki/Predatory_open_access_publishing) Cyril Labbe's expose of almost 120 computer-generated gibberish papers accepted in Springer and IEEE (http://www.nature.com/news/publishers-withdraw-more-than-120-gibberish-papers-1.14763) added to the growing number of cynics who are skeptical about the real efficacy of peer review.

Emergence of social media as a route for post publication peer review or real time, asynchronous discussions about published research (http://www.ncbi.nlm.nih.gov/pubmed/22272866) and publishers like F1000 (http://f1000.com) who actively promote post-publication peer review has further opened up the field for bidirectional discourse instead of hidden, anonymous reviews. Innovations in publishing practices have opened up newer avenues of discourse, which blur the lines of peer review and academic discussions: PeerJ's pioneering move to replicate ArXiv by introducing a free for submission PeerJ PrePrints section, or the BMJ's innovative step to bring social media and scholarly publishing closer by integrating "comments" on published articles (rather than the more formal, and slower alternative of "Letters to the Editor") are examples of such moves.

Peer review is an ever-evolving process and right now, the discourse that is of much interest includes the efficacy of peer review as a sentinel of good science. This issue is inextricably linked with the motivation behind an academic to indulge in peer review for nominal incentives. The growth and evolution of open access as a viable publication model, which is self-sustaining has added another dimension to this discussion. (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3894027/)

Peer review is, in itself, a complex procedure. Although almost always visualized to be a single set of actions, it is more complex. Peer review is a quality assurance process, a vetting process, a category of activities aimed at not only assessing the rigor and scientific value of a submitted work, but also to ascertain plagiarism, manipulation and fraud. In addition, a good review adds to the quality of a work, by identifying not only the positive findings but also the shortcomings all the while focusing on finding solutions to these issues.

Conclusion: What can the JFMPC do to incentivize peer reviewers' work?

While there are real questions and cynicism around peer review, we are of the opinion that the continued evolution of the system, aided and abetted by research and advocacy, is essential to reach a system which is optimally poised to serve as the sentinel for scientific discourse. In this situation, the Journal of Family Medicine and Primary Care can play a determining role in changing the course of peer review in the context of a rapidly expanding discipline in the setting of a developing country.

The JFMPC is already an open access journal, so it would not be possible to provide access-related benefits, which has long been practiced by Nature and some journals belonging to the Elsevier group. However, being an online open access journal, JFMPC may offer its peer reviewers the option of having their reviews published as an accompanying critique of the published article. In addition to augmenting the open science dialogue, this could also be viewed as a form of academic contribution, especially by junior researchers. This is where the role of support from academic institutions and research organizations come to the fore. If such contributions can be accounted for during assessment of academic activities, it would be a very real incentive for peer reviewers.

A traditional manner in which a journal editor can academically reward a reviewer is to provide a publication opportunity to the reviewer in the form of a 'publishable

commentary.' This is a standard practice in a few journals edited by author RB. The peer review document, following modifications, were published as accompanying commentaries (http://www.igi-global.com/viewtitlesample.aspx?id=75182&ptid=59650&t=on+being+a+patient and http://www.igi-global.com/viewtitlesample.aspx?id=76690&ptid=71322&t=how+much+does+post+discharge+follow-up+matter%3f%3a+recommendations+for+the+%E2%80%9Cbig+head%E2%80%9D+case+study) to the original submissions. These had the added benefit of incorporating the reviewers' side of the argument in the academic discourse.

The journal may also consider partial waiver of author processing charges for reviewers who have done a certain number of reviews.

Collaboration with organizations like Publons, which offer peer reviewer recognition as well as rewards for the most prolific reviewers on the portal could be an option worth pursuing. In this regard, the model followed by ResearcherID (http://www.researcherid.com/Home.action) or ORCID (http://orcid.org) which endeavor to provide a digital identifier for an academic, which can be used as an online repository to bring together all his published work, could be emulated. In fact, rather than reinventing the wheel by introduction of newer indices or modification of existing ones, simply linking every reviewer with their ORCID could help centralize the review work undertaken in a central database to create an e-portfolio of review as well as research activities. However, this would require the system to universally adopt an open peer review system, which comes with its own share of problems, as previously mentioned.

The JFMPC is uniquely poised for impact in this arena since it also happens to be the official organ of the Association of Family Physicians of India (AFPI). This links it up with the multitude of activities that the Association undertakes. One way of rewarding reviewers could be to provide waivers for conference fees or other academic events. A simple, yet effective incentive, could be to recognize the work done by the reviewers at the annual conferences, and perhaps identify some of the most prolific reviewers for a token award. This could be a simple, yet inexpensive way of encouraging peer reviewers. The AFPI could provide CME credits ratified by an appropriate authority to the reviewers based on the number and quality of reviews conducted by them.

The rapid growth of Internet-based repositories as a popular medium of dissemination of scientific data in real time has emerged as Internet use and information needs have penetrated even into the rural areas. (http://www.scielo.org.za/scielo.php?pid=S0256-95742012000300021&script=sci_arttext&tlng=es) With newer avenues opening up in the world of scientific publication, it is high time peer review was forced to come out of its inertia and evolve in order to move into the next era. Although we recognize that there are multiple issues with the process and motivation behind peer review, we do not ascribe to the pessimistic views some academics hold and believe that with the implementation of appropriate policies, peer review may be improved. (http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.0050107)