Review of: "Behavioral optimization in Scientific Publishing"

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This is an excellent and insightful manuscript describing many of the difficulties and disadvantages with the current peer review process and some thoughtful potential courses of action to improve the process.

As authors argue, we must give more credit for scientific review in order to improve the peer review process. Authors point out the need for “sufficient incentive for reviewing” as well as allowing reviewers to build a reputation for good quality reviews.

I agree that reviewers should be able to enrich their CVs with their skilled review work. “This carrot and stick approach can fundamentally alter the cost-benefits of reviewers motivating (reviewers) towards greater efforts, greater quality and timely inputs.”

“The possibility that whatever you write is being made public is sufficient to make the reviewers more responsible about the quality of review report.”

Authors also address editor responsibilities and how the current system may discourage acceptance/publication of important, ground-breaking ideas and research.

‘It is likely that some work might be ahead of its time and therefore not appreciated by reviewers at the time of publication. Today such work simply does not get published. In the new system it would certainly get published”, may be with not so positive comments.

Authors make several excellent, alternative recommendations:

“If accessibility of all editorial correspondence becomes the norm, even rejection decisions will have to be made with responsibility.”

Rather than accept or reject, editors could assign a grade to the paper, from 0 to 10 based on the reviewers’ comments the editor.

The part that is missing from discussion is that this process will be just as biased.

Bias. The authors write about reviewers’ and editors’ bias in terms of costs and benefits, “most of the biases originate in the evolved innate tendency of every player to optimize one’s own cost benefits.”

However many excellent studies in leading peer reviewed journals show that innate unconscious bias exists based on

gender and race/ethnicity. Such biases can be measured by simply changing first names. If a resume, CV or article has a female or ethnic first name, the quality ratings of the item are significantly reduced compared to the identical item with a typical white male name (RL Roper, 2019. Does Gender Bias Still Affect Women in Science *Microbiology & Molecular Biology Reviews* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6710458/

Eaton, et al 2019. How Gender and Race Stereotypes Impact the Advancement of Scholars in STEM: Professors' Biased Evaluations of Physics and Biology Post-Doctoral Candidates, *Sex Roles)*

Studies have shown that an article with a woman as first or senior author are more likely to be rejected at the first round than manuscripts with male author names (AK Hagan et al, Women are Underrepreseted and receive Differential Outcomes at ASM Journals: A Six Year Retrospective Analysis, *MBio* 2020)

The authors here state that 'double blind peer review can at the best be a pretence, or a smokescreen', but studies show that blinding the applicants' names can make a significant difference. When applications for time on the Hubble telescope were blinded, the success of women applicants suddenly increased and surpassed those of male applicants for the first time. While well-read scientists familiar with the discipline may be able to hypothesize the applicant's identity from the history of their research, blinding author names still seems to show positive results. (Stefanie and Kirk 2020. Dual-anonymization Yields Promising Results for Reducing Gender Bias: A Naturalistic Field Experiment of Applications for *Hubble Space Telescope* Time. *The Astronomical Society of the Pacific*)

Reviewers could be required to take some bias training in order to address this problem. Many studies have shown that *good* bias training has major impacts on outcomes. As The 2018 report from The National Academies of Sciences, Engineering, and Medicine stated "Training to reduce personal bias can cause larger-scale changes in departmental behaviors in an academic setting", and the US NIH and NSF include bias training for grant reviewers. Indeed one study showed that institution bias training in the Canadian system (CIHR) decreased apparent bias in grant reviews (G. Guglielmi, Gender bias goes away when grant reviewers focus on the science *Nature* 2018 https://www.nature.com/articles/d41586-018-01212-0). Studies show that good bias training has major impacts on hiring outcomes as well (G. Smith, et al. 2015 Now Hiring! Empirically Testing a Three-Step Intervention to Increase Faculty Gender Diversity in STEM, *BioScience*; Devine, et al 2017. A Gender Bias Habit-Breaking Intervention Led to Increased Hiring of Female Faculty in STEMM Departments. *J Exp Soc Psychol*.)