

# Review of: "Behavioral optimization in Scientific Publishing"

GiangiacoMo Bravo<sup>1</sup>

<sup>1</sup> Linnaeus University

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Despite being an empirical researcher, which means that I don't feel 100% confident in evaluating the quality of an opinion paper like this one, I think it proposes a thoughtful and well-informed analysis of the current peer-review process and advances a bold but interesting proposal for a reform of the system. This said, the author should be clearer in the Introduction (and possibly in the title and abstract) on the fact that this is an opinion paper, certainly educated and interesting, still not research. Although this is clear when reading the full paper, I found the abstract and Introduction somewhat ambiguous in this regards.

This said, I think the author does a nice job in dissecting the peer-review process and highlighting the incentives faced by participants playing different roles in the system. In addition, a proposal about how to reform peer review to cope with some of its current biases is advanced (quite in line with Qeios' manifesto, I have to say).

Although the proposal certainly is interesting, the author seems somewhat over-optimistic when detailing its benefit, while possibly downplaying its cost. From this point of view, I can only recommend more cautiousness, possibly taking also into account my points below.

Despite explicitly referring to "the principles of human behavior", and actually presenting several examples of cognitive biases at work, the analysis is mainly framed in a rational-choice, cost-benefit framework. The author should better discuss the consequences on his analysis and suggestions of adopting a more cognitive perspective based on bounded rationality instead. For instance, under the proposed system the authors themselves should be free to publish a paper receiving a bad grade "if they are confident about their work and think that the comments and the grades are unfair" (manuscript, p. 12). However, this does not take into account various well known biases (from overconfidence to the "Ikea effect"), which may result in many low-quality works not being retracted or at least sufficiently revised, hence moving the system from an excess of Type B errors to an excess of Type A ones (using the authors' terms, but see my comment below).

I think there is a certain confusion in the use of the "cost-benefit" expression. Put it this way, it comes naturally (to me at least) to think that *cost* is the numerator, *benefit* the denominator. However, at p. 4 I read: "For maximizing a ratio, reducing the denominator is a more effective strategy than increasing the numerator. Therefore a ratio optimizer is keener on cutting the costs." This only holds if cost is the numerator. I suggest to try to improve the language, maybe more systematically using the "benefit to cost ratio" expression instead.

Finally, a minor terminological issue. At least in statistics, it's more common to talk about Type I errors (false positives)

and Type II errors (false negatives) than Type A and Type B errors. I suggest the author to conform to this standard.

## SPECIFIC COMMENTS

- Abstract: "... optimize one's own cost benefits". I suggest to change that to "... optimize one's own cost-benefit ratio" (see also my more general point above).

- P1: "... biases were invariably detected by every study". I'm sorry to quote my own work but, contraindicating what you wrote, in a comprehensive analysis on gender bias in peer review we only found minimal biases (if any) and not in the expected direction (<https://doi.org/10.1126/sciadv.abd0299>).

- P 14: "... publication is ultimately accessible for all authors, the gender and place of work bias will be removed from publication decision". Since the proposed system could only work under an open access framework, there would still be publication costs paid by the authors. This may favor the ones coming from more prestigious and rich institutions able to afford these costs anyway.

- P 14: "... while calculating impact factor like indices the citation data would be weighed by the grade given to each of the papers." However, this creates an incentive for the editors to give high grades in order to foster the journal IF, besides that if the grade is used by readers as signal of the paper quality, it may increase quotations as well. This risks to lead to grade inflation.

- P 15: "Any journal adopting a new system might find it more difficult to get reviewers ...". Sorry to quote (again) a previous work of ours but, studying the transition to open peer review in five scientific journal, we found that publishing reports did not significantly decrease the referees' willingness to review (see <https://doi.org/10.1038/s41467-018-08250-2>).