

Dr. Ludo Waltman  
Editor, *Quantitative Science Studies*

9 August 2021

Dear Dr. Waltman

Attached please find the requested revisions to our manuscript on article processing charges and the geographic diversity of author communities (MS No. QSS-2020-0068.R1). We are again very grateful for the referee's feedback, and to you for the opportunity to submit a second revision.

Below we respond in turn to each referee's individual comments. We were able to make the requested revisions without adding additional text to the body of the MS (current lengths 4715 words). We did add some additional figures, tables, and text to the Appendix.

We do have one request for your consideration. As part of our effort to ensure the complete reproducibility of our study, our manuscript is written in Rmarkdown with embedded code to conduct calculations and analyses and formatting in APA style via the `papa.ja` package. The .docx versions of manuscripts generated with this package are quite poor (e.g., lost formatting, poorly rendered and spaced figures), so inserting corrections with track changes was essentially impossible. Fortunately, the changes requested were straightforward, so instead of submitting revisions with changes in "track changes mode", **all new text is in red** and any text that has been deleted is ~~struck through~~. We hope this is acceptable – the edits are obvious and readable – but if an MS Word version is absolutely necessary we will do our best to find a solution.

Thank you again for your efforts, and we look forward to hearing from you soon.

Best regards,



Emilio M. Bruna  
University of Florida  
(on behalf of all coauthors)

## Reviewer 1 ( = Reviewer 3 of the original version)

Overall, I am very satisfied with how my comments and suggestions were taken into account in the revision, and I especially thank the authors for the very substantial work of incorporating the distinction of OA in the parent journals (POA) into the paper.

We appreciate the referee's kind words, and again thank them for such clear feedback on the original submission.

The results on geographic diversity between POA and Mirror OA (MOA) could be further clarified and the distinction between single and first authors could be better reflected in the discussion.

We have added text to the Discussion and "*Future directions*" section clarifying some of these distinctions and their importance.

Some issues, like the relevance of single/first author distinction, could be mentioned already in the introduction.

The potential for differences in the ability to pay APCs based on having coauthors or not is now in the introduction. (line 84)

Please find my detailed comments and suggestions below.

1. Page 4 (lines 63-66): OA citation advantage is found also in case of self-archived articles published in subscription journals. Green OA could be mentioned in this context.

We now include the Green OA in this sentence. (line 66)

2. Page 5 (line 95): Here Elsevier's mirror concept is introduced. It would be great if authors could, in the introduction or discussion, say something about the adoption (if any) of the same or similar concept by other publishers. Are the Elsevier Mirror journals the only option for this type of analysis? As regards the potential future analyses, is it possible to say anything on the development of this concept at Elsevier or elsewhere?

It appears the American Mathematical Society has a mirror system as well (the *Series B* journals). The limited uptake of the mirror system and potential reasons behind it are now addressed in the discussion. (line 395-399)

3. Page 7 (131-133): As regards the third prediction, please clarify if you mean by "lead authors" both single and first authors, or only the latter: "Third, that any such reductions would be due to OA articles having fewer lead authors from the low-income countries predominantly located in the Global South".

"Lead" is both single authors and first authors of co-authored papers. Though we recognize these authors face different pressures regarding choice of publication outlet, reporting results without this shorthand would have quickly become cumbersome ("First-and single authors", "First" and single-authors"...). We now clarify our usage of the term in the introduction (line 135) and the discussion includes text on the potential differences

between author groups worth investigating.

4. Page 8 (164-165): Please explain here in more detail your interpretation of results: “We found no difference in the Geographic Diversity of authors of these two groups of OA articles (Table A2, Figure A3)”. In Table A2, Geographic diversity of MOA is lower than POA for all countries (11.97 vs 13.28) but larger (18.29 vs 17.33) when China & USA are excluded. However, according to Table 2, there appear to be relatively large differences between MOA and POA in case of single authors.

Though the diversity of OA articles published in Mirror and Parent journals (all authors pooled) was indeed lower (all countries) or higher (no China / USA), it was not significantly different when China and the USA were excluded to correct for their numerical dominance. While we would have liked to have done the permutation tests comparing by authorship category (e.g., single-author in Mirror vs. Parent, first-author in Mirror vs. Parent) we were unable to because several journals had no articles in one of the categories. We attempted to address this using the bootstrapping approach and found nothing to suggest were significant differences in diversity when comparing by category. We explain this in further detail in the legend to Figure A3, and also made a subtle change to the text reporting the results to clarify that the differences were not statistically significant.

5. Page 9 (lines 190-195): the distinction between single and co-authored papers is introduced here because of “the potential insights into financial constraints”. Perhaps this topic could be discussed already in the introduction as one of the factors potentially influencing the submission decisions.

This is a good suggestion, so we now mention the potential for differences in the ability to pay APCs based on having coauthors in the Introduction. (line 84-85)

6. It is also important to recognize that co-authorship patterns differ considerably between fields, and the possible implications of this. It might be helpful to provide here (on page 9) a clear presentation of the number of Psub, POA and MOA articles that are single- or co-authored, for all countries and excluding China & US (like table 1).

We now address disciplinary norms regarding co-authorship and author order in the "Future Directions" section. We also included the requested table in the Appendix. We thank the referee for the suggestion, as it gave us the idea to emphasize the one non-significant difference in author diversity between OA and Subscription journals was for the comparison including < 3% of the articles published during our focal time period.

7. Page 11 (line 253): please use “Single-authored” instead of “Sole-authored articles”, terminology should be consistent throughout the paper.

We changed to 'single-author' throughout.

8. Please explain here in more detail what the difference in Table 2 between POA and Psub (10.3 vs 9.9) means, as this result would seem to suggest that there is no difference in geographic diversity of POA and Psub when China & US are excluded.

We realized thanks to the referee's question that a missing word ("not") meant that the text and table gave contradictory summaries of the results. We have corrected this (lines 250-264), and also focused the text on whether or not the differences in diversity were

significant (to avoid confusion in cases where values were numerically but not statistically lower).

9. According to Table 2 it also seems that the geographic diversity is much larger for single-authored MOA (17.4) than POA (10.3).

Comparisons of  $D_2$  across journal types or authors is not appropriate because the sample sizes can be very different and diversity indices - including  $D_2$  - are sample-size dependent (this was the motivation behind our bootstrapping approach). We have added this note to the legend of the relevant table to help prevent readers from making these inappropriate comparisons.

10. Page 13 (lines 290-292): It is stated that “We found that the Geographic Diversity of authors publishing Open Access articles, for which APCs are required, was significantly lower than that of authors publishing subscription-only articles.” It should be clarified to what extent this holds true for first as well as single authors. The distinction between single and first authors is currently not appropriately reflected in the discussion. There are several unanswered questions: what may explain that single-authors are more frequent (21%) in Mirror journals Parent journals (2%), what are the differences in geographic diversity between MOA and POA, and most importantly what are the potential insights into financial constraints?

We have attempted to clarify these differences wherever possible in the text. As for the unanswered questions, we agree that our results suggest there are some important unanswered differences, one of which is the use of mirror journals by single authors. While we could speculate about this in the Discussion, we would prefer not to as this issue is beyond the scope of our study’s data/analyses. With that in mind we prefer to instead point out this disparity to readers and suggest discerning author motivation is a fruitful topic for future research using qualitative approaches. (Lines 415-426)

11. Page 36 Figure 7: consider using share instead of number of articles

This plot gives two important results – that the number of OA articles published by the “top” OA publishing countries can differ substantially, and that more OA articles are published in Parent than mirror journals (the location of points above or below the 1:1 line; we were more interested in conveying “more or less” than the exact percentage). That said, we explored various options for visualizing these data with the percent published in each, including the use of a similar point plot and a stacked percent bar plot. Neither were able to effectively convey both results. We will gladly include a plot with the share in each in the Appendix, if the Referee and Editor think it would be useful.

## **Reviewer 2 (= Reviewer 1 of the original version)**

I think the revised article is much more explicit in terms of methods and analysis, and the authors have done an excellent job of addressing the reviewers’ comments. I think the results now are more robust. I cannot properly evaluate whether my initial comment about the discrepancy in proportion between the numbers of papers compared in Mirror and parent journal is adequately addressed by the statistical methods the authors applied. I will leave this to the editor to decide, as he is much better acquainted with these methods than I am. But otherwise the paper is ready to be published with minor revisions.

Again, our thanks for the helpful feedback on the original submission.

1. One last caveat. The authors write: “whether Mirror journals are acceptable Gold OA outlets is situation-specific cOAlition S 2021. However, the link in the references leads to the page on Transformative Journals, and only 45 Elsevier journals have TJ status. Nothing is said there about situation-specificity, and it is not clear to me what the authors mean by it. cOAlition S states very clearly that Mirror journals are not Plan S compliant...The authors would have to check the Journal Checker Tool, but I doubt very much that mirror journals will be listed as compliant with Plan S policy: cOAlition S funders will not pay for the APC in them.

The referee is absolutely correct - Mirror Journals are *not* compliant. We removed the admittedly hazy language; the new version makes clear that for those dealing with cOAlition S Funders the journals are not compliant and that uncertainty outside of plan S might be influencing author decisions. (lines 411-415)

2. Now if by 'situation-specific the authors mean that non-cOAlition S funders (e.g. NIH, China) may allow for publication in mirror journals, while cOAlition S funders do not, that should be more clearly indicated. As it stands now the sentence is confusing.

Yes, we meant "funders" in very general terms. We have clarified this in the text, as well as made clear that cOAlitionS funders have clarified that they do not consider mirror journals 'PlanS' compliant. (line 413)

3. Typos: 409: Ludo Waltman, and provided feedback -> and Ludo Waltman provided feedback

Corrected.