A bibliometric study of research topics, collaboration and centrality in the Iterated Prisoner's Dilemma.

December 7, 2020

Response to the reviewers

We would like to open this response by thanking the reviewers for their thoughtful comments and suggestions. We have fully taken their comments on board and made modifications and additions to the manuscript. We feel this has greatly improved the work.

We will now take each comment of the reviewers in turn and highlight our efforts to improve the work.

Reviewer 1

Reviewer Point P 1.1 — First, the authors used search terms "prisoner's dilemma", "prisoners dilemma", "prisoner dilemma", "prisoners evolution", and "prisoner game theory" to collect data. However, they did not justify the reasons for the use of these terms. Why these terms, is there any support for the choice?

Reply: We have added a sentence justifying the use of the specific search terms.

Reviewer Point P 1.2 — Second, I am wondering whether you had conducted manual screening of collected literature to ensure their close relation to the research target. Different from systematic review aiming to provide in-depth analysis of representative literature, bibliometric analysis is used for big data analysis to enable a comprehensive and general view. Thus, sufficient coverage of relevant literature are especially essential for a bibliometric study. In particular, you included articles which had used any of the search terms in the title, the abstract or the text. The use of title and abstract is understandable since they are commonly used to search articles (you can refer to bibliometric studies such as,

- `https://www.sciencedirect.com/science/article/pii/S0360131520300555,`

- `https://bera-journals.onlinelibrary.wiley.com/doi/full/10.1111/bjet.12907?casa_`
  `token=vCNbiEvDF5gAAAAA%3Ap9AeWKgtwePj-ABgaPIFecQrTObZdjh26sG49aeHs47Ms7zHROw8I_`
  `JhUpvQnOlZOVx5oCrzwmCN1kTsVQ,`

- https://idp.springer.com/authorize/casa?redirect_uri=https://link.springer.com/
  article/10.1007/s11042-020-09062-7&casa_token=z8E4b9PYoncAAAAA:9X2oCiTpIRj2V6xMkkLsjXvAyD
  K-fLdb67SLc3zUFxoCmmniFJCNprc20XInB9KPum71LMCw),

however, the inclusion of full text can be troublesome as it may result in too many irrelevant articles being included. Thus, manual screening is needed and should be conducted to ensure data quality.

Reply: We agree with the reviewer's point. We agree that articles which refer to the prisoner's dilemma in the text do not necessarily study the topic. For that reason we have conducted a manual check of all the articles included in our study because the search terms existed only in the text. This was not clarified in our original submission. We now clearly state that manual screening was conducted.

Reviewer Point P 1.3 — Third, you have to clearly justify bibliographically your paper selection, your descriptors, inclusion and exclusion criteria you used to select paper, and the aspects you analyze, in such a way that your viewpoint is rationalized.

Reply: We have included a sentence, in the Introduction section, to justify our selections.

Reviewer Point P 1.4 — Fourth, in your study, the appropriate number of topics was chosen based on the coherence value. Coherence indicates the possibility terms within a topic commonly appear together. However, there is also another commonly used indicator called exclusivity, which indicates the possibility the terms are exclusively related to the topic. Commonly, the two indicators will be used to select the best fitted model together. Hence, suggest adding it in your study, so to choose the appropriate number of topics by using both coherence and exclusivity.

Reply: We thank the reviewer for their suggestion to also include the exclusivity score. We have included exclusivity in our analysis.

Reviewer Point P 1.5 — Fifth, in page 9, the authors mentioned "The three models are LDA models for the entire data set for n equal to 5, 6 and the optimal number of topics over time," it is not clear to me what do you mean by "the optimal number of topics over time." How was it defined and calculated? Details should be provided.

Reply: We have included more details.

Reviewer Point P 1.6 — In addition, the authors should specify clearly the significance of their study, what specific implications can be obtained from their analyses, particularly those concerning future research directions As one of the typical aims for review paper is to analyze the previous studies in order to provide helpful suggestions or directions for researches to conduct future studies. This should have been done in the Discussion and Conclusion sections. The authors need to summarize their findings instead of presenting and discussing individual findings. More importantly, they need to inspire the readers by providing a list of suggestions/directions of future research based on the discussion. The authors need to advise readers what to do next rather than ask the readers to interpret the data on their own.

Reply: Thank you for this comment which encouraged us to reflect on the conclusions of the paper. As a result we have re-written the conclusion section.

Reviewer 2

Reviewer Point P 2.1 —

- The analysis of the co-authorship network is not convincing for me. The author created a cross-sectional map of the co-authorship network and argued that people in central positions benefit from their network. But it is not analyzed whether they benefit in anything only whether someone if centrally located or not and how dense is the network. The author did not analyze whether those who are more in a central position indeed get more collaboration subsequently or not. Further, the author said 'Nevertheless, there are authors that do benefit from their position, but these are only the authors connected to the main cluster.' This is a tautology as the criteria for benefitting was based on their central position.

- I suggest only analyzing the centrality measures and structure of the co-author network (result section) and discussing what this could mean based on the previous literature (conclusion section). I would avoid claiming that benefit were tested in this paper.

Reply: We agree with these two points made by the reviewer. We have removed the discussion regarding benefits and we just present the results on the centrality measures.

Reviewer Point P 2.2 — The author said that "The fact that most authors of the main cluster are primarily publishing in evolutionary dynamics on networks indicates that publishing in this specific topic differs from the other topics covered in this manuscript.". Couldn't this mean rather that authors publishing in evolutionary dynamics are more similar to other disciplines as they can collaborate with them more?

Reply: We agree with the reviewer. The suggested interpretation was included in the paper.

Reviewer Point P 2.3 —

- I was not convinced that the dataset covered all relevant article and only the relevant articles. It was not described at all what steps were taken to find the grey literature that was not covered by the database searches. Did you hand-searched the citation of eligible studies or consulted with experts? These are all very important steps to get a comprehensive review. I know that some steps were taken as the author mentions to include some extra paper. Further, what steps were taken to ensure that only relevant articles were included? An abstract can mention Prisoner's Dilemma but not analyze this topic. Usually, it is good to scope the abstract (at least) to check whether studies were of interest. Further, the number of duplicates should be reported.

- I suggest mapping your data collection in a flow chart.

Reply: We have re-written our data collection process to include more details. We have also included a flow chart to visualize the process.

Reviewer Point P 2.4 — The strength of ties could be analyzed to map multiple collaborations between two nodes.

Reply: We agree with this point. We performed a preliminary assessment which showed that our results remain the same. This is included in the conclusion.

Reviewer Point P 2.5 — The contribution of the paper should be named in the introduction.

Reply: We have made this suggested change.

Reviewer Point P 2.6 — Disciplines differ a lot in the number of co-authors. For example, medical papers often have more than 5 co-authors where sociology papers often have single authors. Isn't the results merely coming from this pre-established difference between disciplines?

Reply: We agree with the reviewer that there is a pre-established difference between disciplines. The aim of the paper is to understand the difference of the prisoner's dilemma compared to other game theoretic fields.

Reviewer Point P 2.7 — The structure of the text needs to be improved a lot before this work is publishable. The methodology should be outlined in the Methodology section and not in the Results section (e.g. fitting exponential lines to the number of articles to see that the numbers are increasing). The contribution of the paper needs to be in the introduction and not in the last paragraph of the Methodology section.

Reply: We have made this suggested change.

Reviewer Point P 2.8 — The text contains some grammar mistakes (e.g. "The performance of the models are") typos (e.g. "Figure ??") and unclear reference (e.g. "In comparison, 2b gives the visualisation of LDA" where 2b could refer to a Table, Figure, or topic).

Reply: We have gone over the manuscript and corrected any typos.

Reviewer Point P 2.9 — The abbreviation should be spelt out the first time they are used and then the short version should be used consequently.

Reply: We have made this suggested change.

Reviewer Point P 2.10 — I like that Latent Dirichlet Allocation is defined in the introduction. But it would enhance the readability if it was defined the first time it is used.

Reply: We have made this suggested change.

Reviewer Point P 2.11 — The author said that "The appropriate number of topics is chosen based on the coherence value". 6 topics provided the best coherence value but still 5 topics were selected. The description of this conduct is a bit confusing.

Reply: We have made this suggested change.

Reviewer Point P 2.12 — Reference to software should go to the method section instead of the Acknowledgment.

Reply: We have made this suggested change.