Author’s response to reviews

Title: Does academic interest play a more important role in medical sciences than in other disciplines? A nationwide cross-sectional study in China

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Response Letter to Editors and Reviewers

Dear Editors,

We would like to thank you and the reviewers for taking the time to read our manuscript as well as to provide invaluable insights to enhance the depth of our research. We have revised our manuscript according to the recommendations made by the two reviewers. In the revised manuscript, the new changes are written in blue for easy reference.

Below you will find our point-by-point responses to the comments from you and the two reviewers:

Editor Comments:

#Comment 1. Please explicitly mention in the Abstract and the Methods section the study design, cross-sectional, retrospective, prospective, ...

* Response: Thanks for your comments. Following your suggestion, we have now explicitly mentioned in the Abstract section that it is a retrospective cross-sectional study. We also added more details about the research design of this study in the Methods section.
Comment 2. Please explain if the category referred to as "Medical Sciences" includes as health professions as dentistry, nursing, ... or only medicine.

* Response: Thanks for pointing this out. The umbrella category of Medical Sciences includes eight majors which are basic medicine, clinical medicine, stomatology, public health and preventive medicine, traditional Chinese medicine, integrated western and Chinese medicine, pharmacology, and science of Chinese pharmacology. We have added this information into the revised manuscript. Besides, we now use the term of ‘Medical Sciences’ instead of ‘Medicine’ consistently throughout the manuscript to avoid misunderstandings.

Comment 3. Table 4/ other tables: pls provide the meaning of the abbreviations used in the 1st column as a footnote below the table along with the already existing terms.

* Response: Thanks for the request to clarify the abbreviations used in the tables. We have now added the meaning of the abbreviations as a footnote for each table as suggested.

Comment 4. Discussion: pls provide more comparison of the present study findings to previous studies.

* Response: In accordance with your suggestion, we have added more information in the Discussion section. We have highlighted the contents for your easy reference. Thanks.

Comment 5. Discussion: page 14, lines 48-50: pls provide a reference to support the statement.

* Response: Thanks so much for raising this important concern. We appreciate your attention to detail, and we have added two references as shown below.


Reviewer reports # Dirk Tempelaar (Reviewer 1):
#Comment 1: In this paper, the method of propensity scores takes a crucial position. The description of the method is very brief, and kind of replaced by a reference to Rosenbaum and Rubin (1983). But that is not sufficient. For example, as a measure of effect, the authors apply the ATT, whereas in the Rosenbaum and Rubin article the more commonly used ATE measure is applied. The authors provide a formula for the ATT that differs from what I know from the literature (should the conditioning refer to the full expression, as in the current paper, or only the second term of the expression). Any information about the statistical inference with regard to ATT is missing. This section is too brief: more information needs to be in.

*Response: Thanks for these constructive comments! We really appreciate your effort on pushing this manuscript more methodologically sound. We agree with the reviewer that the method of PSM was crucial in this paper, therefore, a detailed introduction of this method is needed to content the broad readership of this journal. We have now revised this part significantly. As noticed by the reviewer, the ATE was applied in Rosenbaum and Rubin’s (1983) research instead of ATT. On the one hand, we also realized that this reference is not appropriate. We have now added more references about the PSM method. On the other hand, we would like to explain why we chose ATT rather than ATE in our study. ATT is estimated to quantify the effect of treatment on those who actually have involved in the treatment group, and it is the parameter of interest in most evaluation studies (Caliendo and Kopeinig, 2008). And one key challenge when estimating ATE is that both counterfactual outcomes E[(Y (1) |W=0] and E[(Y (0) |W=1] cannot be observed and have to be constructed. We believe that ATT is adequate to answer our research questions. For the formula of the ATT in our paper, we followed the same one in Caliendo and Kopeinig’s (2008) research. Moreover, we illustrated the necessary steps to perform PSM in the revised version to help readers get a clear understanding of how PSM works.


#Comment 2: This is an observational study, based on data of cross-sectional type. That brings many limitations, as acknowledged on p.15/16. However, in the remainder of the paper, the authors seem to be less aware of these limitations. In quite some places, they write sentences that presume causal mechanisms. Such as 'Academic interest does have a significant causal effect on academic performance' (p.1), 'The results demonstrated that academic interest does have an influence on achievement' (p. 16), 'students need to have a relatively high academic interest to achieve academic excellence’ (p. 13), 'academic interest does have a significant effect on students' academic achievement' (p. 14). But you need more than mere correlations to make these claims!! Please revise all of the statements, so that nowhere any causal claim is made.
Response: Thanks for this suggestion. We should have been more cautious about the interpretation of our results. In this study, we don’t think the expressions would be a big problem. The main purpose of PSM is to propose propensity scores that can adjust for difference of covariates between the treated and untreated groups. Therefore, PSM provides a method to make causal inference about treatment effects in nonexperimental observational studies (Dehejia and Wahba, 2002). But we do appreciate the reviewer’s feedback. To avoid any potential misinterpretations, we have elaborated relevant sentences in the manuscript. Thanks again.


Comment 3: Why is Interest classified in 2 classes, rather than 4? The measure is of Likert type with 4 categories, so why throw away the information contained in that rich classification in favour of a classification in 2 types? The authors just mention it; I would also expect a justification for such an unusual step.

Response: We appreciate the reviewer’s perspective. We believe that we did not clearly explain this point in the original manuscript. The main reason is that the treatment effect refers to the causal effect of a binary (0-1) variable on an outcome variable (i.e., academic performance) in PSM. Thus, we transformed the variable of interest into two classes rather than four. We have added this information in the revised manuscript.

Comment 4: Interest is measured through a one-item instrument. The authors shortly discuss single-item measures versus multiple-item measures, but that is only one argument, one of secondary nature. The more important issue is that all contemporary theories of interest in learning regard the construct as a multifaceted one. Maybe one can do with one item per construct, but one does need at least one item per different facet. This study disregards all of these contemporary views on the role of interest in learning processes. That requires at least mention in the limitations section.

Response: Very good suggestion. We acknowledge that interest is a multidimensional construct, e.g., situational interest versus individual interest. It would be interesting and fruitful to examine how different types of interest affect students’ academic achievement across different disciplines.

However, the main focus of this study is to examine the effect of interest on academic performance across different disciplines at a general level. But in the future work, we will definitely consider this valuable suggestion seriously. In terms of measuring interest with single-
item, we had provided another two justifications: (1) we have a large sample size (N = 54,398), and (2) single item does not overburden students in a large-scale survey. But we do understand the reviewer’s concern about this issue. Thus, we mentioned the potential weakness of this practice in the limitation section.

#Comment 5: Language issues. Please have a final check by a native speaker. Although the paper reads well, there are quite some sentences that do not run smoothly (Another explanation for this phenomenon is that higher academic interest that also indicates, …; p. 14) or use terms that are incorrect (various mythological or analytical issues (p. 4); I assume you mean methodological issues).

*Response: Thanks so much for highlighting the grammatical errors in this manuscript. We feel sorry for any inconveniences in your reviewing process that caused by the writing of this paper. We have addressed the aforementioned errors. We have also read through and picked up a few more grammatical errors and typos that had still slipped through. Besides, we have asked a native speaker to proofread this manuscript as you suggested.

Reviewer reports # Javier Bonilla-Escobar (Reviewer 2):

#Comment 1: Authors mention three questions that remain "unclear" to the best of their knowledge. Two of them are answered along the article, but there are no comments or discussions about the question "Should students be aware of their academic interests when applying universities and disciplines? I recommend to separate that question from the two main of the article.

*Response: Thanks for this comment. With all due respect to the reviewer, we would like to explain why we do not agree with this suggestion. As noticed by the reviewer, we had two research questions. With regard to the ‘third’ question (i.e., Should students be aware of their academic interests when applying universities and disciplines?), it is informed by the results from the two research questions. We had mentioned the implication pertaining to this question in the Discussion section: “Students should be aware of their domain-specific academic interests rather than merely rely on external factors (e.g., occupational status or social persuasion) when submitting their applications to the admission offices of universities and colleges. For example, academic interest is particular more important in ‘hard’ natural sciences compared with others if they expect good performance in academics”. Thanks again.

#Comment2: Authors should acknowledge the data collecting limitations of anonymous self-reporting, such as recall bias.
* Response: Following your suggestion, we have added the limitations of self-report in the Discussion section. Please refer to p.16 for the information.

#Comment3: It is not necessary to give an extensive explanation about the propensity score matching (PSM) and the average treatment effect on the treated (ATT). A brief mention of key points may be enough. It could state directions to interpret results obtained from those type of analyses.

* Response: Thank you for this suggestion. We agree that the explanation of the propensity score matching (PSM) should be concise and more focuses need to be placed on the interpretation of the results. Given the broad readership of this journal, we have revised the PSM section to make it clear to readers. Besides, we have provided more comparison of the present study findings to previous studies.

#Comment4: Tables do reflect the main results obtained, and are mention in the text in an appropriate fashion.

* Response: Thanks for your positive comments. We appreciate your feedback for helping us improve our work.

In closing, thank you again for your consideration of this manuscript. We look forward to receiving your response.

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