Author's response to reviews

Title: Big Fish in a Big Pond: for Medical Students; a study of academic self concept in first year medical students

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Author's response to reviews: see over
Dear editor
Thank you to you and the Reviewers for the comments. I have listed these below and added our response to the comments. We have also taken the opportunity to improve the references and some of the detail.

Editorial Comments:

1. Experimental research that is reported in the manuscript must have been performed with the approval of an appropriate ethics committee. Research carried out on humans must be in compliance with the Helsinki Declaration (http://www.wma.net/e/policy/b3.htm). A statement to this effect must appear in the Methods section of the manuscript, including the name of the body which gave approval, with a reference number where appropriate.

   This has now been incorporated.

2. We have read through your manuscript and feel that the quality of written English needs improvement.

   This has now been corrected

We advise you to seek the assistance of a fluent English speaking colleague, or to have a professional editing service correct your language. Please ensure that particular attention is paid to the abstract.

If you wish to use a professional editing service, BioMed Central recommends Edanz (http://www.edanzediting.com/bmc1); please contact Edanz directly to make arrangements for editing, and for pricing and payment details. Other editing services are available should you prefer to use one of them. Please note that use of an editing service is not a guarantee of acceptance for publication.

3. Please include a Conclusions section as the last section of the text. This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

   Added

4. Please restructure your Authors? Contributions section at the end of the manuscript, before the reference list. We suggest the following kind of format (please use initials to refer to each author's contribution):

   ?AB carried out the molecular genetic studies, participated in the sequence alignment and drafted the manuscript. JY carried out the immunoassays. MT participated in the sequence alignment. ES participated in the design of the study and performed the statistical analysis. FG conceived of the study, and participated in its design and coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

   This has now been updated in line with above.

5. Kindly include a header for your Background and Reference list.

   Done
Reviewer 1

**Reviewer’s report:**
Big Fish Small Pond effect is an important educational issue widely studied across different countries and setting. It is a particularly relevant issue in elite training when the effect suggests equally capable elite would have lower self-concept when being trained (educated) in a competitive setting with peers of higher average competence. In previous BFLPE studies with selective schools, Olympic games, gift-education programs, etc., the universality of the effect has been demonstrated. In this study, the use of both quantitative (questionnaire surveys) and qualitative (in-depth interviews) methods is appropriate and brings rich information on the issue.

Some discussion points for the authors' consideration:

In Study 1, the survey was conducted in Semester 1 and 2. Please provide more details. At which point of time did the first survey take place? Assuming the biggest drop in self-concept (due to BFLPE) happens at the very beginning after entering the program (when they see how competitive their peers are), then the baseline has to be as close as possible to the beginning of the school term. Otherwise, it is a possible explanation that a significant drop of self-concept was not observed in the present study (because the biggest drop in self-concept has already taken place when you collect the first baseline).

*This was included in the discussion, but has now been described in the methodology, along with a theoretical explanation for the timing.*

Another possible limitation to be added to the discussion is the effect of the short duration of the intervention. As the time gap (Semester 1 to Semester 2) is short, if we assume there is a (small but) continuous drop in self-concept in the whole program, then the effect due to a few month immersion in a competitive program may not be strong enough to be observable.

*We theorised that the first time students were delivered material that would allow the comparison would be the time at which the effect is first seen. We have now added that explanation to the paper.*

Of course, the authors have provided other more important factors (small sample size, short term reflected glory at the beginning of the school year) that explain the non-significant effect.

**Level of interest:** An article of outstanding merit and interest in its field

*Thank you*

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

Reviewer 2

**Reviewer’s report:**
MAJOR COMPULSORY REVISIONS
1. The authors do not clarify the difference between academic self-concept and academic self-efficacy. They rely heavily on Marsh because of that author’s connection with BFLPE, but do not cite any other literature that is very relevant here. 
   
   *A brief description has now been added*

2. The authors recognized this themselves -- the number of students in study 1 is too small and possibly not representative and therefore it is not possible to generalize results to entire class.

   *No comment necessary*

3. Because the authors could not recreate the necessary BFLPE environment, they offer readers what is a "leap" -- that a decline in academic self-concept is evidence of the existence of BFLPE.

   *We have added that this is the theoretical base for this study.*

4. The authors do not clarify the grading scheme at their school. Regardless of the fact that students are clearly seeing scores (and class means), is the final scheme pass fail or A, B, C, D etc? This would definitely impact competitiveness but might also impact self-concept. THAT would be interesting to know. For instance, if P/F in the first two years I would recruit second year medical students and compare responses to third year medical students who are competing with each other for Honors/A grades.

   *The section on the scoring has been strengthened.*

5. There is also a much bigger literature on attribution theory (e.g., Deci & Ryan) that provides evidence that attribution is more complex than internal vs. external. A review of this literature by the authors might have influence how they reported their findings.

   *A brief section has been added*

**Reviewer 3**

**General comments:**

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This is a very interesting application to medical education of the ‘Big-fish-little-pond effect’ (BFLPE). The explanation of the effect (and related evidence-base) is clear.

1. Is the question posed by the authors well defined?
   
   Yes, the questions and hypothesis are clear.

2. Are the methods appropriate and well described?
   What was done [the methods] is reasonably clear but, in certain sections, combining mentions of what was done/what was found/what it means confuses some points. It would be better if the Methods just outlined ‘what was done’, and the Results ‘what was found’, leaving the Discussion to outline ‘what it means’ in relation to the evidence- [and theory-] base and everyday undergraduate medical education practice.

   *This has now been corrected*

3. Are the data sound?
Further detail is required in the Methods, and further caveats should be highlighted in Discussion.

**Corrected**

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   As above, further detail is required in reporting these data.
   **Corrected**

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   The Discussion/Conclusions are coherent and balanced. A few assertions should be checked, and the concluding sentences should be clearer about the practical implications (should the hypotheses/research questions be corroborated further).
   **Corrected**

6. Are limitations of the work clearly stated?
   The caveats highlighted in the Discussion should be reinforced and supplemented. There should be much more justification about why a study with such a low response rate for the survey (only ~20 responders, and no information about non-responders) should be heeded.
   **This is now incorporated at several points in the manuscript.**

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
   The original premise for the study (and its origins in the literature) is clear.
   **No comment necessary**

8. Do the title and abstract accurately convey what has been found?
   Consider using the term ‘mixed methods’ if that is what you consider this to be (and consider using an appropriate reference to the ‘mixing’ approach used). The variation on the BFLPE terminology might be confusing in the title.
   **We have removed the term “mixed methods” from the title as technically it is not a mixed methods study, but two separate studies. We feel the title will attract attention to the paper.**

9. Is the writing acceptable?
   The writing is clear, despite there being a few glitches to clarify or amend.
   **Glitches amended**

Specific comments/suggestions/requirements:

- **Major Compulsory Revisions**

  1. Abstract: “The qualitative study suggested that the attributions that students used when discussing performance could negatively affect self-concept.” It suggested that the attributions used were those for which there is evidence that they might undermine self-concept (but that was not shown in this study).
     **Agree – statement changed**
2. p4: “Thus, according to the BFLPE, it is better for academic self-concept to be a big fish in a little pond [to be a good student in a group of average ability students] than to be a small fish in a big pond [to be a good student in a group of high ability students].” It would help to note why (or at least acknowledge that) the effect is named after the desirable situation rather than the situation that should presumably be avoided, especially when the next sentence refers to ways “proposed to overcome” the effect.

Agreed – section is expanded

3. p5: “The present investigation consisted of two studies.” The nature of the ‘mixed methods’ design should be inserted here, the paradigm used, and how the data in one study are meant to relate to the other, e.g. ...complementary studies rather than one informing the design of the next? ...mixing at the level of analysis and/or interpretation, etc.?

We have decided to remove reference to mixed methods as the approach was two separate studies.

4. p5: As per abstract, clarify that the participants of each study are separate. It is also unclear whether that separation was unintentional, given that all first years were invited for both studies. It is also unclear when those invitations were made in relation to each other.

Agree – this has been corrected

5. p5: Clarify the ethics approval and study permissions process.

A separate statement is now included

6. p6: There should be a brief description of educational context for the medical students in this curriculum (ahead of the Methods). Without this, it is difficult to interpret the findings and implications, such issues often being rather context-specific.

Agree – a separate paragraph has been inserted outlining the course and curriculum.

7. p6: “were invited to participate”: How (considering the low response rate)? Re: “during tutorials”: ...using their educational time? What sort of tutorials were involved, how were students asked, and with what assurances?

Agree – This is now outlined in the method section

8. p6: “were moderately correlated”: ...how about with each other?

Included along with discussion

9. p6: “Twenty students completed both Time 1 and Time 2 surveys...”: How many completed just one? How was data linkage between the two time-periods achieved – unique identifier, names, etc.? Would students in the tutorials know who was/was not participating?

This information is now included

10. p7: Expand a little on the concept of ‘assimilation effect’.

Now included
11. p8: Give more detail about the focus group procedure, e.g. whether a schedule/prompts were used, the setting/timings, number in each group, etc., and in the Discussion acknowledge that purposive sampling was not used and any implications of this.
   All now included

12. p9-10: “...found that students who attributed success and failure to external causes had slightly lower self-concepts” versus “Using the internal attribution of lack of effort...”: Clarify, as it seems as though, whether the attribution is external or internal, the relationship is inverse with self-concept? That is confusing.
   The statements are correct but the method of presentation was confusing.
   We have now clarified the statement
   External attribution is associated with lower self concepts
   The internal attribution of lack of effort is also associated with lower self concepts

13. p10: “When asked... students overwhelmingly stated... (8 responses)”: Clarify how this relates to Table 2, and why 8 is ‘overwhelmingly’.
   We have now removed “overwhelmingly”, although stand by that statement that of the comments relating to how they evaluated their performance the majority stated.
   We have noted on the tables the total number of students taking part.

14. p10: While the possibility of Type II statistical error is suggested, more should be highlighted about potential selection bias, for which a comparison between responders and non-responders to the survey has not been made. A further caveat includes the lack of linking between data in the ‘mixed methods’ design, i.e. between the two studies.
   We have expanded the section on limitations and have removed any reference to mixed methods.

15. p10: The missed potential of such linked data on individuals is not acknowledged. No paradigmatic assumptions have been outlined as a prelude to the Methods, and the Discussion lacks mention of the implications of the approach taken and the assumptions made.
   An additional paragraph has been added to page 9.

16. p10: It is unclear why focus groups were chosen over semi-structured interviews, and why students needed to disclose these ideas in a group setting if the interplay between responders and their comments was not crucial to the interpretation.
   We agree that interviews would provide more information, but chose focus groups because of severe time limitations.

17. p10: The Discussion would benefit from a few concluding sentences about the ‘so what?’ of the findings. What are the educational and practical implications if these findings were corroborated?
   Two sentences at the end of the paper now cover this issue.
• Minor Essential Revisions

All of the following have been corrected or altered as suggested.

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18. p3: "important for good mental health29": This reference-number seems out of sequence and format.
19. p3: “and then split into” to “and then split into”
20. p5: “ability compared to” to “ability compared with”; “Time 2 compared to Time 1.” to “Time 2 compared with Time 1.” ...and throughout, as appropriate.
21. p6: “Twenty students volunteered (13 female). Ages ranged from 17 to 38 years, with a mean age of 20.65 years (SD = 4.92).” This should be in Results.
22. p6: “have been show” to “have been shown” “Cronbach’s alpha for the current sample...” This should be in the Results.
23. p6: “Self-evaluation at Time 1 and 2 and...” This should be in the Results.
24. p6: “(the same). Means for Times 1 and 2 are shown in Table 1.” to “(the same) (Table 1).”
25. p7 & p11: “The results suggest that medical students...” The rest of this section should be under a separate Discussion, as should from “To be accepted into medical school in Australia...” to the end of that paragraph.
26. p8: Analysis: Clarify that this was manual (rather than electronic) ‘processing’.
27. p8: The first sentences of the Results 1 and 2 are repetition, and the rest of each first paragraph is about context-setting that should be placed earlier (with further detail of the educational setting of the students).
29. Ensure that the titles of the tables stand alone in conveying who, where, when, etc. Currently, the titles are not sufficiently informative without reading them together with the main text. Show the sample sizes (n=20?; n=19? And n=24? responders - a table footnote in Tables 2 and 3 about the missing two and seven would help, if that is the case). In Table 2, presumably the number of ‘responses’ results from one answer per responder, rather than some responders giving answers in more than one theme. How were answers in a focus group kept to one aspect per participant? This would not be how a focus group would usually function?
30. Table 2 & Table 3: Show 100% total.
Minor points re: terminology, spelling, grammar, etc.:

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• Discretionary Revisions

The following have all been corrected

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31. p4: “However, as demonstrated by BFLPE research, when students are segregated on the basis of their academic ability their academic self-concepts suffer, and according to the REM, their academic performance may also decline.” to “As demonstrated by BFLPE research, however, when students are segregated on the basis of their academic ability, their academic self-concepts suffer and, according to the REM, their academic performance may also decline.”
33. p5: “aimed to quantitatively investigate” to “aimed to investigate quantitatively”
34. p5, p9: “exam” to “examination”, and throughout, as appropriate
35. p7: “using a two-tailed approach was used” to “with a two-tailed approach was used”
36. p9: “However, the two main themes...” to “The two main themes...”
I trust the manuscript now meets publication requirements

Yours sincerely

Ian Wilson
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