Author’s response to reviews

Title: Attentional bias modification in reducing test anxiety vulnerability: A randomized controlled trial

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Author’s response to reviews:

Dear Editor and Reviewers,

Thank you for your letter and for the reviewers’ comments concerning our manuscript entitled “Attentional bias modification in reducing test anxiety vulnerability: A randomized controlled trial” (ID: BPSY-D-17-00445R3). These comments are all valuable and very helpful for revising and improving our paper, as well as the important guiding significant to our researches. We have studied comments carefully and tried our best to make corrections which we hope meet with approval. The main corrections in the paper and responses to the reviewer’s comments are as following:

Brage Kraft (Reviewer 1): General comments:

First, the language is improved. Wording and sentence structure is more appropriate. However additional language revision is needed. Some sentences are too intricate and needs restructuring for clarity. Moreover the structure of the text needs improvement. Consider rearranging paragraphs, increase coherence, etc..
Response: Thank you very much for this comment. At this time, we had our paper edited by the professional English teacher who has been engaged in language editing for many years, especially for intricate sentences. Besides, the structure of the text has been modified. The introduction about test anxiety was move to the 3rd paragraph before the limitation of previous researches. The objectives of this study were added before the various methodological choices are presented. And the introduction about CET-6, as you suggested, was moved from discussion to introduction. We hope the paragraphs rearranging could increase coherence of our paper.

Second, I really struggle to understand what role test anxiety is playing in this paper:

In the title, there is an expectation that the paper is about test anxiety. The abstract states that "The aim of this study is to examine whether attentional bias modification (ABM) can be used to modify high test-anxiety individuals' attention to emotional information". Then the concept of test anxiety is introduced. The discussion also refers to test anxiety, and the conclusion in the abstract is "Attentional bias modification can be used as an intervention to reduce test anxiety". However, there is nothing in the Method or Results section which justifies this focus on test anxiety. Yes, test anxiety is measured using Test Anxiety Scale (TAS). But there is no sampling based on TAS. There is no valid argument whatsoever that the current sample represent "high test-anxiety individuals". Further, test anxiety is not used as a variable in the analyses. The conclusion stating "In summary, the current study demonstrates that attentional bias modification away from a threat is effective for individuals preparing for an exam" is more appropriate. What could be interesting is to examine whether test anxiety is related to the ABM effect.

Response: Thank you very much for this careful work. We are sorry that we failed to solve the problem thoroughly in first revised manuscript. Without the post-test of TAS, it is hard to examine the direct effect of ABM on test anxiety. Therefore, we do not use “reducing test anxiety” or something similar in this version any more. Instead, as you suggested, we tend to use change the bias to threat. The conclusions of abstract and full text have been modified.

Additionally, our participants are all the candidates preparing CET-6, a very important test for their degree and graduation. We supposed that majority of them were experiencing test anxiety. In fact, their TAS results also showed they were (Mean=15.42 >12, Newman, E., 1996). Therefore, we continued using these term “test anxiety individuals” and “individuals experiencing test anxiety” in this study.

In the following research, as you pointed, we must go on examining the direct effect of ABM on test anxiety by both pre-test and post-test of TAS.
Third, I'm confused about the terms "vulnerability", "emotional vulnerability", "stress vulnerability", "anxiety vulnerability", etc. There is a need for a more self-explaining and simpler description of these variables. For example, what you term "stress vulnerability" is the change in salivary amylase (sAA) from pre to post eStroop. Thus, you examine changes in sAA reactivity from pre to post ABM. I would prefer to change the naming of the variable "stress vulnerability" to "sAA reactivity", or something similar. Likewise, what is termed "anxiety vulnerability" actually refers to changes in state anxiety levels. Therefore, I suggest using the term "state anxiety reactivity", or something similar. Moreover, I think you should present more clearly that the eStroop is used both as a stress induction, and a measure of attention bias.

Response: Thank you for this very instructive comment. Actually, we also run into the problem how to name these variables. Here, you gave us very helpful suggestions. “sAA reactivity” is referred as changes in sAA, rather than other stress-related index. Therefore, we have changed it throughout this revised manuscript. However, we want to continue using “anxiety vulnerability” when it comes to the change in current analog anxiety scale, because this naming method is more conventional and easily understood. On the hand, it has been already used to indicate the change from pre and post stressor (Suway, White, & Vanderwert, et al., 2013; Macleod, Rutherford, & Campbell, et al., 2002). On the other hand, the “state anxiety reactivity” reads more related to state anxiety scale, which may make readers think it was assessed by this scale. More self-explaining and description have been added in (Page 9, line7).

Besides, we added the statement that the eStroop is used both as the stress induction and the measure of attentional bias (Page 9, line 24).

Specific sections:

Introduction:

- You must provide a more clear description of what the present study is about before the various methodological choices are presented. For example regarding the sentence "Therefore, a no-training blank group (waiting list group) was included in the current study to control for the placebo effects, positive expectations and demand effects". This sentence gives no meaning because the reader barely knows what the current study is about yet.

Response: Thank you for careful work. The structure of the introduction has been modified in this revised manuscript. Current research objectives were added before the various methodological choices are presented (Page 5, Line2).

- The structure of the introduction needs more work.
Response: The structure of the introduction has been modified in this revised manuscript. The introduction about test anxiety was moved to the 3rd paragraph before the limitation of previous researches. The objectives of this study were added before the various methodological choices are presented. And the introduction about CET-6, as you suggested, was moved from discussion to introduction. We hope the paragraphs rearranging could increase coherence of our paper.

Page 4, line 41: what is "TAI"?
Response: Thank you very much for your careful work. We are sorry for this wrong statement. Here, we wanted to talk about individuals with high test anxiety (TA), so the extra letter I was deleted in current manuscript.

Page 7, line 1: "the participants were informed via e-mails regarding their assigned group and the following programs". What does this mean? Where the participants informed about which experimental group they were assigned to, or not?
Response: Indeed, it is via e-mail that the participants were informed about which experimental group (A, B or C) they were assigned to. After that, they knew whether they should take part in training sessions or just wait for the post-test. But the participants remained blind to the treatment hypotheses and the content of the other treatment groups.

Results:
- Presentation of the results needs to be simpler. Consider presenting relevant results using graphs when appropriate. There are a lot of information in the tables, consider making them supplementary.

Response: Thank you very much for this instructive suggestion. Fig 5 was added to make the ANOVA results easy to understand. Table 3 was deleted and the other tables were retained. Many data in table were used in more than one analysis. On the one hand, they needed to be compared for ANOVA. On the other hand, they were computed into attentional bias value which would be used in another ANOVA. Therefore, we prefer to just show the descriptive results in the tables, and ANOVA results would be shown in the text. We imagine it would be easily understood.

- Please give a short description of what the interaction between test and group actually means.
Response: There is an interaction between test and group on the attentional bias scores. After repeated measurement of variance analysis, exploratory analyses were conducted via paired sample t-tests to examine group changes in attentional bias. We found the ABM group showed a significant change in the attentional bias scores after the 5-day training, whereas there were no changes in the attentional bias scores in the placebo group or the waiting list group. It meant that individuals after ABM training tended to have less attention on threats than before, but the other groups remained unchanged. These statements have been added in the end of paragraph “Change in attentional bias measured with eStroop task ”.

- The ANOVA Table 3 is not interesting. ANOVA tables can be relevant when using covariates.

Response: Thank you for this comment. Table 3 has been deleted in current manuscript and relevant descriptions on ANOVA analysis could be found in this paragraph and Fig 5.

- The authors should reconsider which analyses are presented, in what order. I suggest that the authors limit the number of analyses presented.

Response: At lab meeting, we discussed this suggestion you gave. To explore the effect of ABM in three different groups, we compared three main index: RT in eStroop, sAA and VAS.

RT in eStroop was the index that we are most interested in. Firstly, we confirmed that there was no significant difference in three groups. Then, A 2 * repeated measurement of variance analysis was conducted on the attentional bias scores. Interestingly, the interaction of test and group was found, so exploratory analyses were conducted via paired sample t-tests to examine group changes in attentional bias.

On the other hand, sAA and VAS were used as auxiliary index. Changes of them were assessed via univariate analysis. In order to examine the difference in emotion vulnerability during a stressor, reactivity scores were calculated by subtracting the sAA and VAS before and after the eStroop task. Likewise, univariate analysis was used to compare the differences between groups after training.

Finally, we carry out Pearson correlation to explore the relationship between attentional bias toward state anxiety reactivity, which showed significant correlation emerged only in the ABM group.

Above are the analysis strategies we used in this study, and some of them were stated in manuscript (page10, line26). Here, we wanted to keep current analysis and hoped the explanation could make it clear.
Method:

- Figure 2: the figure needs more details regarding the exact sequence of the procedure.

Response: Thank you very much for this valuable suggestions. The measurement sequences on pre- and post-test day have been shown in current figure. And the ratio of neutral and threats followed by dot has also been added in this version. We hope these details could make the figure understandable.

Discussion:

Page 13, line 43-49: consider whether this belongs in the introduction section.

Response: Thank you very much for this comment. It really belongs to introduction section, as background of current study. This part has been moved to Page 5 Line 2 in the introduction.

- I don't understand the relevance of "Therefore, we proposed there were different levels of test anxiety in our participants who were preparing for the exam".

Response: We are sorry that we failed to make it clear in the original manuscript. Here, we wanted to say that the majority of candidates who are preparing for CET-6 must experience test anxiety. And now the sentence has been modified in this revised version.

- What is "repeated concreteness training"?

Response: We are sorry that we failed to give enough clarification. Not a specific training, repeated concreteness training here is referred to carrying on attentional bias modification for many times, not carrying on placebo training or for only once. The concept Concreteness Training has been used widely in many cognitive bias modification papers, such as ① Watkins, E. R., Baeyens, C. B., & Read, R. (2009), ② Watkins, E. R. (2009), & ③ Mogoașe, C., Brăilean, A., & David, D. (2013).

- Describe exactly why it is "suggested that standardized exam related images be used in future research"
Response: Thank you very much for this instructive comment. We failed to give enough details in the original manuscript. Images from the International Affective Picture System rather than exam related images were used in the dot probe task. In most cases, it is exam-related information that induces the candidate’s negative feelings (Smith, & Ellsworth. 1987). Therefore, it is suggested that standardized exam related images be used in future research. In this case, it may be more effective to modify high TA individual’s AB from negative exam-related information to positive exam-related one. Above statements have been added in current manuscript (Page 15, Line 17).

Lauren Hallion (Reviewer 2):

The authors have adequately addressed my concerns. I have one additional minor recommendation, which is to use the term "wait list control group" instead of "blank group" because the former is more conventional and easily understood.

Response: Thank you very much for your recommendation. As you pointed, waiting list group is much more conventional and easily understood, so we have changed the blank group to waiting list group throughout current manuscript.