Author's response to reviews

Title: Belief system, meaningfulness, and psychopathology associated with suicidality among Chinese college students: a cross-sectional survey

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Author's response to reviews: see over
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Title: Belief system, meaningfulness, psychopathology associate with suicidal behaviors among Chinese college students: a cross-sectional survey (Manuscript ID:1824781597647899)

Dear Mr Jimmar Dizon and Dr Ian Rockett,

Thanks a lot for the constructive and informative advices to help us in improving our current manuscript. In especial, the statistical suggestions had greatly informed us both in the revision of the current manuscript and in our future work. We had also improved our language quality by inviting a native English speaker to edit the paper. We hope the final manuscript could be acceptable for publication in your journal. Should there need further revision, please inform us.

We look forward to receiving your feedback as to whether the revision will be suitable for publication.

Sincerely,

Jiubo Zhao
Department of Psychology, Southern Medical University

Response to reviewers

Reviewer: Robert Young

Reviewer's report:

The manuscript has improved considerably in several areas, and the authors have addressed many of the concerns raised by the reviewers. However, I think it still requires some attention in a few areas. That said, the study appears to be fundamentally sound, well conducted and reports some important and interesting findings from a non-western perspective. Accordingly, I would encourage the authors to continue with the submission, which should result in a manuscript with some very interesting and potentially important findings.

Minor/Major Essential Revisions

1) Language: I realise this may be a difficult aspect for non-native English speaking authors, but there are still several awkward sounding sentences, flow, word choices and superfluous sentences
in the manuscript. Curiously, several sections/paragraphs flow well, e.g. the description of
Confucianism. I wonder if two key authors are involved in the main writing!

**Response:** We had re-edited the paper by a native English speaker. We hope the revised version
would be more fluent.

2) The manuscript is still verbose in parts and could be condensed considerably. If the discussion
focused on only the key points this could be easily achieved. All of the points discussed are
relevant, they just seem to be over-elaborated. There are parts that may require further explanation
for a western audience. For example before further investigation, I did not know what ‘Deng
Xiaoping Theory’, ‘Important Thought of Three Represents’, and ‘Scientific Development
Concept’ meant?'

**Response:** We had condensed the manuscript throughout, especially in the Discuss section. The
final manuscript was 626 words shorter then the previous one.

We had provided footnotes in the manuscript for “Deng Xiaoping Theory”, “Important Thought of
Three Represents”, and “Scientific Development Concept”:

Deng Xiaoping Theory is the series of political and economic ideologies first developed by
Chinese leader Deng Xiaoping.

The Important Thought of Three Represents is a socio-political ideology credited to General
Secretary Jiang Zemin which became a guiding ideology of the Communist Party of China at its

The Scientific Development Concept is the current official guiding socio-economic ideology of
the Communist Party of China incorporating sustainable development, social welfare, a
humanistic society, increased democracy, and, ultimately, the creation of a Harmonious Society.

3) Suicidal behaviour vs. suicidal ideation: I agree with my fellow reviewer that it is a mistake to
label suicidal thought and cognitions as suicidal behaviour. One solution would be to use different
term: suicidality or suicide risk as a term to encompass both thoughts and behaviours.

**Response:** we agree with the suggestion of the reviewers. We used “suicidality” to refer to a
continuum of suicidal ideation, attempt, plan, and completed suicide.
Minor Essential Revisions

Analysis – the authors have made considerable improvements in the analysis, but there are a few issues that need resolved. Given most of the models should be set up this should take only minimal effort to address.

4) Missing data: The authors rightly test the models using only complete data. Unfortunately, deleting incomplete data is one of the poorest methods to address missing data issues (see http://missingdata.lshtm.ac.uk) and by doing so the authors, miss the opportunity to use one of AMO’s best and easily implemented features. Using the full-information maximum likelihood option, is simple to use in Amos, would increase statistical power and at least partially address missing data issues.

Response: Thank you for such good advice, and it would greatly help us in addressing the missing data issue in our future work. However unfortunately, our current dataset includes only complete data, because the missing cases are small (only 0.7%), and we had deleted it in the early-stage of data analysis.

5) The authors select the unconstrained multi-group model as their ‘final’ model despite some obvious similarities and differences in gender – now an important feature of the paper. The authors demonstrate an ‘overall gender difference’ in the multi-group model. The key question we need to address is this - which of the pathways are the same across genders and which show a gender difference? The unconstrained model and the modification index available in Amos could be used to identify the pathways that differ most. For example, the pathway from Religious belief to Psychopathology is likely to be significantly different for males and females; in the constrained model, its modification index should be significant, as should the pathway from Political belief to psychopathology. Freeing these and other key constraints could result in a better fitting final model.

Response: Thank you for your good advice, and we had re-analyzed the data using a multi-group SEM solution. The pathways from political belief by religious belief to suicidality, political belief to psychopathology and religious belief to psychopathology were left free one by one. The final released correlation paths model allowed three pathways (political belief by religious belief to suicidality, political belief to psychopathology and religious belief to psychopathology) to remain
free, but constrained all the other pathways to be equal between males and females. The fit of this model was adequate (see Table 2), $\chi^2 = 665.74$, $df = 261$, $\chi^2/df = 2.55$, RMSEA = 0.04, CFI = 0.96, NFI = 0.94, IFI = 0.96. However, the fit of the model was significantly different than that of the unconstrained model, $\Delta\chi^2 = 55.37$, $\Delta df = 24$, $P = 0.000$, AIC = 899.54, ECVI = 0.77 and not significantly different than that of the measurement weights invariance model ($\Delta\chi^2 = 10.13$, $\Delta df = 9$, $P = 0.340$) and structural weights invariance model ($\Delta\chi^2 = 3.80$, $\Delta df = 3$, $P = 0.284$). Although all four models (i.e., the unconstrained and three constrained models) yielded adequate data-model fit, we selected the unconstrained model (see Fig. 2 and Fig. 3) as the final model according to $\Delta\chi^2$, AIC, and ECVI indices [48].

### Table 2 - Goodness of fit indices for model comparisons

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$\chi^2/df$</th>
<th>$\Delta\chi^2$</th>
<th>$\Delta df$</th>
<th>$P$ value for $\Delta\chi^2$</th>
<th>RMSEA</th>
<th>CFI</th>
<th>NFI</th>
<th>IFI</th>
<th>AIC</th>
<th>ECVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold for acceptable fit</td>
<td></td>
<td></td>
<td></td>
<td>$\geq 5$</td>
<td></td>
<td>$\geq 0.05$ (Significant Level)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unconstrained</td>
<td>614.16</td>
<td>240</td>
<td>2.56</td>
<td></td>
<td></td>
<td></td>
<td>0.04</td>
<td>0.96</td>
<td>0.94</td>
<td>0.96</td>
<td>890.16</td>
<td>0.76</td>
</tr>
<tr>
<td>Measurement weights</td>
<td>655.61</td>
<td>252</td>
<td>2.60</td>
<td>41.44</td>
<td>12</td>
<td></td>
<td>0.04</td>
<td>0.96</td>
<td>0.94</td>
<td>0.96</td>
<td>907.61</td>
<td>0.78</td>
</tr>
<tr>
<td>Structural weights</td>
<td>669.54</td>
<td>264</td>
<td>2.54</td>
<td>55.37</td>
<td>24</td>
<td></td>
<td>0.04</td>
<td>0.96</td>
<td>0.94</td>
<td>0.96</td>
<td>897.54</td>
<td>0.77</td>
</tr>
<tr>
<td>Released correlation paths model</td>
<td>665.74</td>
<td>261</td>
<td>2.55</td>
<td>51.57</td>
<td>21</td>
<td></td>
<td>0.04</td>
<td>0.96</td>
<td>0.94</td>
<td>0.96</td>
<td>899.74</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Note: $\chi^2$=chi-square; $df$=degree of freedom; $\chi^2/df$=The chi-squared /freedom ratio; RMSEA =Root mean square error of approximation; CFI=Comparative fit index; NFI= Normed fit index; IFI =Incremental fit index; AIC =Akaike information criteria; ECVI =Expected cross-validation index.

The chi-square deference ($\Delta\chi^2$) tests are compared with the unconstrained model (baseline model).

6) It is good SEM practice to include factor loadings in SEM figures. For the purposes of replication and transparency - if you use a variable in the model you should report its loadings. The authors could sidestep this by supplying a supplementary figure with all loadings (including SCL-90 subscores), while retaining current simplified figure in the main paper.
Response: we had included all the factor loadings in SEM figures in additional file 2 and 3.

7) A similar position is true regarding the reporting of correlations (including SCL-90 subscores means & SD) and/or the variance-covariance matrix. The authors have now used separate male and female datasets and so should now supply a table for each. Again, these do not have to be included in the main manuscript and could be given in a supplementary table. Fundamentally, the table must contain ALL the information (including Means and SD for binary data) necessary to replicate the models. The current table does not contain the information required.

Response: we had appended a table containing the mean, SD and correlation matrix of SCL-90 with separate male/female datasets in additional file 1.

8) The manuscript requires some further condensing and ‘tiding up’. For example decimal points could be reduced where appropriate (e.g. results to 3 decimal places are not required when reporting Chi-square or AIC).

Response: Thank you and we had revised the results accordingly.
### Additional file 1– Mean, SD, and inter-correlations among SCL-90 subscales

| SCL-90 Subscales | Total sample (n=1168, Mean ± SD) | Male (n=542, Mean ± SD) | Female (n=626, Mean ± SD) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------|---------------------------------|-------------------------|----------------------------|---|---|---|---|---|---|---|---|---|---|
| 1 SOM            | 0.25±0.34                       | 0.26±0.34               | 0.24±0.35                  | — |   |   |   |   |   |   |   |   |   |
| 2 O-C            | 0.90±0.59                       | 0.95±0.59               | 0.86±0.58                  | 0.50** |   |   |   |   |   |   |   |   |   |
| 3 I-S            | 0.80±0.59                       | 0.82±0.56               | 0.78±0.60                  | 0.43** 0.70** |   |   |   |   |   |   |   |   |   |
| 4 DEP            | 0.56±0.52                       | 0.55±0.49               | 0.57±0.54                  | 0.53** 0.72** 0.72** |   |   |   |   |   |   |   |   |
| 5 ANX            | 0.53±0.47                       | 0.54±0.46               | 0.52±0.48                  | 0.63** 0.68** 0.67** 0.74** |   |   |   |   |   |   |   |   |
| 6 HOS            | 0.40±0.48                       | 0.44±0.48               | 0.38±0.47                  | 0.43** 0.55** 0.58** 0.56** 0.55** |   |   |   |   |   |   |   |   |
| 7 PHOB           | 0.39±0.45                       | 0.37±0.41               | 0.42±0.49                  | 0.45** 0.56** 0.63** 0.60** 0.62** 0.41** |   |   |   |   |   |   |   |   |
| 8 PAR            | 0.48±0.48                       | 0.52±0.49               | 0.45±0.47                  | 0.46 0.59** 0.66** 0.61** 0.65** 0.60** 0.46** |   |   |   |   |   |   |   |   |
| 9 PSY            | 0.52±0.43                       | 0.52±0.43               | 0.51±0.43                  | 0.51** 0.68** 0.71** 0.72** 0.68** 0.56** 0.56** 0.63** |   |   |   |   |   |   |   |   |
| 10 SD            | 0.53±0.48                       | 0.54±0.49               | 0.52±0.47                  | 0.55** 0.56** 0.56** 0.65** 0.63** 0.52** 0.45** 0.54** 0.62** |   |   |   |   |   |   |   |

Note: *p<0.05, **p<0.01.

SCL-90 – Symptom Checklist-90-Revised; SOM – Somatization; O-C - Obsessive-Compulsive; I-S - Interpersonal Sensitivity; DEP – Depression; ANX – Anxiety; HOS – Hostility; PHOB - Phobic Anxiety; PAR - Paranoid Ideation; PSY – Psychoticism; SD – Sleep and Diet.
Additional file 2 - Standardized structural coefficients for belief system, meaningfulness, psychopathology associate with suicidality among male Chinese college students.
Note: *p<0.05, **p<0.01, ***p<0.001.
χ²=614.16, df=240, χ²/df=2.56, RMSEA=0.04, CFI=0.96, NFI=0.94, IFI=0.96.
SOM – Somatization; O-C - Obsessive-Compulsive; I-S - Interpersonal Sensitivity;
DEP – Depression; ANX – Anxiety; HOS – Hostility; PHOB - Phobic Anxiety;
PAR - Paranoid Ideation; PSY – Psychoticism; SD – Sleep and Diet.
To narrow the focus of the figure, error terms are not displayed. Here, ellipses and rectangles represent the latent and observed variables, respectively.
Additional file 3 - Standardized structural coefficients for belief system, meaningfulness, psychopathology associate with suicidality among female Chinese college students.

Note: *p<0.05, **p<0.01, ***p<0.001.

χ²=614.16, df=240, χ²/df=2.56, RMSEA=0.04, CFI=0.96, NFI=0.94, IFI=0.96.

SOM – Somatization; O-C - Obsessive-Compulsive; I-S - Interpersonal Sensitivity;
DEP – Depression; ANX – Anxiety; HOS – Hostility; PHOB - Phobic Anxiety;
PAR - Paranoid Ideation; PSY – Psychoticism; SD – Sleep and Diet.

To narrow the focus of the figure, error terms are not displayed. Here, ellipses and rectangles represent the latent and observed variables, respectively.