Reviewer’s report

Title: Type D personality is a predictor of prolonged acute brain dysfunction (delirium/coma) after cardiovascular surgery

Version: 3 Date: 07 Feb 2019

Reviewer: Michael Smith

Reviewer's report:

Thank you for once again giving me the opportunity to review this manuscript. As previously stated, and in agreement with the other reviewer, I find the premise of the paper to be a very good. It makes a novel contribution to the literature, and appears to be methodologically sound in terms of the thoroughness of the data collection.

In my first review of the manuscript, I requested that the authors undertake an analysis based upon the continuous conceptualisation of Type D personality (and provided this reference for guidance: Stevenson & Williams, 2014, Psychology & Health). In a subsequent revision, the authors did this, but chose to use a conceptualisation which involved summing together NA and SI (as suggested by Horwood & Anglim, 2017), rather than the NAXSI interaction. While, in my view, the 'additive' approach is a is a less satisfactory approach to conceptualising Type D personality than the 'interaction' approach (for the reasons highlighted by the other reviewer in the most recent round of revisions), I was content with the approach taken, given that it was based upon a recently published suggestion as to how this construct should be conceptualised. However, I now note that the authors have abandoned all analyses based on the continuous Type D construct, and instead just include NA and SI in separate regression models. Perhaps this is because of the other reviewer's suggestion to delete Table 3 from the manuscript. I don't want to provide any advice which is contradictory to suggestions from the other reviewer, but I am of the view that it is important to include an analysis based upon the continuous conceptualisation of Type D personality (preferably the NAXSI interaction term, which would also allay the concerns of the other reviewer regarding the 'additive' conceptualisation).

Another concern I have with the latest version is with the incorporation of the mediation analyses. In the last round of reviews when I stated "Page 20, lines 5-6 should be reworded, as they imply that mediation was observed, when no such analysis was performed" - I didn't necessarily intend that the authors conduct and include mediation analyses in the manuscript. I was just requesting that the authors modify their interpretation of the findings, which incorrectly implied mediation. The mediation analysis now comes as a bit of a surprise in the Results section, as seemingly no rationale for conducting such an analysis is provided in the Introduction. The authors should therefore either remove the mediation analysis and reconsider their interpretation of the findings in the Discussion, or provide a rationale for including a mediation analysis in the Introduction. If the latter, it needs to be very clear how and why
depression should be considered both a mediator and a moderator of the relationship between Type D personality and DCDs.

One of my comments on the previous version of the manuscript has still not been fully resolved: "Throughout the Discussion, including in the Conclusions paragraph the authors refer to 'Type D personality-associated depressive symptoms'. I'm not sure that this accurately captures what the data are telling us. The interaction between Type D and depression is indicating that the effect of Type D personality on DCFDs is being moderated by depressive symptoms, whereby, depressive symptoms in the presence of Type D personality inflates the Type D effect on DCFDs." This finding is interpreted correctly in the Results section: "Depressive symptoms can therefore be said to have an additive deleterious effect on DCFDs when combined with Type D personality." However, on several occasions this finding is still not correctly described/interpreted in the Discussion section - please rectify.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
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Yes

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No

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I am able to assess the statistics

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