Reviewer's report

Title: A puzzle form of a non-verbal intelligence test gives significantly higher performance measures in children with severe intellectual disability

Version: 1 Date: 29 April 2008

Reviewer: John Oates

Reviewer's report:

1. Is the question posed by the authors well defined?
   Yes.

2. Are the methods appropriate and well described?
   The methods are reasonably appropriate, however there is a lack of clarity in description in parts.

3. Are the data sound?
   As far as can be ascertained from the report, yes.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   The paper structure is poor and there is no mention of ethics approval for Study 2.
   Insufficient details of the scoring of the two test forms are given to enable readers to assess the effect of varying completion rates on performance scores.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   In general the conclusions are supported by the data, apart from the argument that the puzzle form increases attention to the task, thus improving performance. The argument here is not persuasive and this point would be better put as a speculation.

6. Are limitations of the work clearly stated?
   There is a lack of clarity in discussing the relations among completion rate, random responding and performance level. This is a crucial point in relation to the argument that the puzzle form gives a more accurate cognitive measure.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
   Yes

8. Do the title and abstract accurately convey what has been found?
   Yes.

9. Is the writing acceptable?
   Yes.
• Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

10. Restructure paper, reporting each of the two studies separately in order, rather than as at present conflating the two.

11. p.6 Justify and give in detail the hypotheses and predictions in a section before Methods.

12. p.7 Clarify the procedure used for the puzzle form in Procedure; in Procedure give further details of the scoring and correct the apparent discrepancy between the exclusion of non-completers noted here and the p.13 analysis for all participants; move the description of the interval between tests in to Procedure. Remove repetition of points made here that are repeated under Procedure on p.9. Note that restructuring the paper as noted above will mean reworking this part.

13. p.8 Move the hypothesis stated here back to a new section before Methods; clarify in the penultimate sentence that participants were randomly assigned to ‘book first’ and ‘puzzle first’ and move that into Procedure.

14. p.9 In the restructure, give the results of Study 1 after Procedure here.

15. p.10 1st and 2nd sentences: these conclusions should be placed as discussion after Results in the Study 1 report. They are unwarranted by the data provided and need more convincing rationales since they are revisited in the final Discussion. Either name the school for the second study or remove the name of the school in the first study. Clarify here and also in the text currently on p.11 that participants were randomly assigned to book first or puzzle first and also in reference to and the title of Table 1.

16. p.12 2nd para; give p value for the reported r. Why is a Kruskall-Wallis test stated and a Chi-square value given? Correct this.

17. p.13 report the percentage completion rate values in the text. In the 2nd para, 2nd sentence, clarify that those who did not ‘complete the test’ nevertheless made some attempts (presumably). There is the potential for further analyses of numbers of items completed; this would strengthen the paper.

18. p.14 This where the issue of the confound of completion rate with performance is crucially important and requires detailed analysis.

• Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

19. In Table 1, clarify the title. Presumably it should read ‘…for children who completed the standard book form first and the puzzle form first’

20. Label y axes in charts

21. Give details of ethics approval for Study 2
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

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

Declaration of competing interests:
I declare that I have no competing interests