Reviewer’s report

Title: Identifying culturally acceptable cognitive tests in remote Northern Australia

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Reviewer: Adam REEVES

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The authors identify a need for cognitive tests, of attention, visuospatial function, memory, problem solving, flexibility, in younger persons, using a game format, rather than verbalization, appropriate for an Aboriginal population in the remote Northern Territory (NT) of Australia.

Method: new tests were solicited by consultation with locals, re-formulated, piloted, then run. Results were compared to the KICA. English fluency was also tested.

General Comment: this paper is carefully written and backed up by suitable references. The stages of the research, consultation, piloting, and running the tests, are appropriate. The statistical analysis seems excellent. The topic is of great interest, and the paper should be published. I have only minor remarks to make about the presentation.

Comment 1: the hypotheses need more explanation.
The first hypothesis is that an exploratory factor analysis will find different factors - sure, this must be so - but why should they agree with the categories the experimenters have chosen? And if they don't, what will the authors do - change the items in the categories, get more data so the analysis is no longer exploratory, or what? Unclear.

The second is that the test scores will correlate with KICA scores that test the same function; is this because the same things are being tested in the same way, implying a positive correlation (unless the present test is hopelessly random), or is it something to be discovered because the tests only address the same function at an abstract level? Most readers will not know the KICA and will not know whether a correlation with it is meaningful. Actually, I suspect that the population sampled from the supermarket and that sampled to develop the KICA (people approaching dementia) are so different that any correlation should be small or null, in which case, bringing in the KICA distracts from the purpose of the study.

The third hypothesis seems contradictory: the authors state that English proficiency can help, on line 86, but then hypothesize that it will have no effect (line 93). There is no explanation of why. I can see it, if they planned to exclude test items that did correlate - but this would be a matter of test design, not an hypothesis. At any event, more explanation is needed.
Comment 2: it is important to identify tests that are widely used, such as card matching, to see if the Aborigine sample did better or worse than non-Aboriginal rural or city dwellers. Some of the tests were adjusted for the local population, but this is surely a good thing, ideally making performances comparable. (Some of the tests were unique, however.)

Comment 3: for a cognitive psychologist, the (poor) result with the sorting test is most informative - in a cautionary way. It seems obvious that the words used to instruct the participants were poorly chosen, as otherwise the example of equivalent groups (sorting 2 large and 2 small items into each group) would never appear when 'distinct' groups were asked for. These are all normal adults and there is no reason to think that 'distinct' is an impossible concept for them. I wonder if a linguist could explain the outcome. Meanwhile, it just shows how apparently innocent words can trip up researchers and make it appear as if the population being studied is defective in some manner. I wish everyone was as careful as the present team.

Comment 4: line 366. The positive correlation with accuracy and negative with (reversely-scored) speed in factor 3 (Table 1) is most interesting. It should be described as 'concentration', as the authors do, but not as 'attention', which implies that both speed and accuracy improve, as in factor 1.

Comment 5: the authors are trying to develop a useful cognitive test for the NT Aboriginal population. Have they succeeded? Hard to know, but what I wonder is, just how well the first 3 factors can describe test results in a western population using well-established tests of cognition. It may be that the current tests fall short, but perhaps they are just as predictive as the best western tests are in the west, in which case, looking for even better tests for the aborigines could be a waste of resources.

Comment 6: the authors make no mention of other aboriginal groups. I have only met those around Alice Springs, so I have no personal knowledge of NT conditions. However I was told by a guide that his entire clan were displaced to western 'boarding schools' in the early twentieth century, breaking up many of the traditional ways of thought and imposing western patterns (which on their later return to the Alice area they were trying to re-establish). Anyway, I wondered if by 'remote' the authors are implying that this never happened to the NT sample they investigated, or whether their sample has also been influenced by the west (many have some English). This question goes well beyond the current paper, but for outsiders like myself, a broad generalization would be helpful.

**end of review**

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?
If not, please specify which controls are required in your comments to the authors.
Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.
Yes

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