Reviewer's report

Title: Re-evaluating a vision-related quality of life questionnaire with item response theory (IRT) and differential item functioning (DIF) analyses

Version: 2 Date: 16 June 2011

Reviewer: Alan Tennant

Reviewer's report:

I was asked to determine if the authors had addressed Professor Massof's concerns, given he acknowledged that the paper was a 'sophisticated and expert psychometric analysis' of the LVQOL, and that he judged the paper to be 'an excellent paper'.

Professor Massof raised a number of issues which should have been addressed in any revision. These are:

1. The authors do not defend their choice of Samejima's graded response model.
2. The authors must defend the assumptions their choice of mode implies.
3. The authors must explain what a misfit means in terms of assumptions about error distributions.
4. The authors need to address the consequences of their model assumptions with respect to unidimensionality.

With respect to 1) the authors have added text which gives a further explanation of the GRM (introduction) and their justification is that it 'often gives a more accurate reflection of the data'. Presumably, implicit in this is that the much more widely used Rasch polytomous model(s) do not do so. This represents a basic difference between the requirements, as Professor Massof states, of 'axiomatic measurement theory' and the statistical manipulation of the GRM. As this issue is not addressed in the discussion, then the authors really fail to pick up on professor Massof's desire to raise the issues surrounding theory and the development and use of models.

With respect to 2) the authors present a series of assumptions, including unidimensionality, local independence and a standard normal prior distribution of the person parameter. It appears that the authors have not discussed the implications of the latter assumption, although the former are adequately addressed.

With respect to 3) and 4), these were not addressed.

Thus the revision, while improving the paper, still did not address some of the key issues raised by Professor Massof. As this Journal is about methodology, this represents a shortfall in expectations, given this is an appropriate place to raise the substantive theoretical and practical issues surrounding the use of models, as Professor Massof indicated.
Level of interest: An article of importance in its field

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