Reviewer’s report

Title: Assessing the Construct Validity and Reliability of the Parental Perceptions on Antibiotics (PAPA) Scales

Version: 1 Date: 18 September 2013

Reviewer: Martha Sparks

Reviewer’s report:

Dear Ms. Alumran, and Drs. Hou, Sun, Yousef, and Hurst:

Re: Assessing the Construct Validity and Reliability of the Parental Perceptions on Antibiotics (PAPA) Scales

Overuse of antibiotics is indeed an important public health issue. You have gathered an impressive sample in a seldom-studied country to investigate parents' perceptions of antibiotic use.

Major Compulsory Revisions

1) This comment touches on a conceptual issue that is evident in many parts of the paper, starting with the title. Construct validity, the question of whether a scale measures what it purports to measure, is determined based on accumulated evidence from multiple studies. A single confirmatory factor analysis, no matter how well the data fits the model, does not establish construct validity; a CFA is one step toward the establishment of construct validity. Thus, you overclaim when you say that your results confirm the construct validity of the PAPA. What you have done is provide evidence of the psychometric properties and validated the scale structure.

2) In light of (1) above, consider re-naming the paper, perhaps ‘Confirmatory Factor Analysis of the PAPA.’

3) In the body of the text, when you refer to ‘demonstrating the construct validity’ of the PAPA, revise to say that you are validating the scale structure, providing evidence toward establishing construct validity, etc.

4) Convergent and discriminant validity are likewise not demonstrated by a single study of a single measure. At most, the statistical analyses that you ran provide *preliminary* evidence of convergent and discriminant validity.

5) Clarify the model that you originally tested in CFA and how you revised the model based on the results of the analysis. I believe that your a priori model had 6 factors, but you report that you tested a 5-factor model. Your measures and statistical analysis sections should describe the a priori model. The results section should describe the model you retained (e.g., one factor eliminated due to low loadings, several items deleted because…) Consider including two figures, one of the a priori model and one of the final model.

6) In the Statistical Analysis section, provide additional information about your
model and your CFA technique. Is Generalized Least Squares a model of CFA? Or did you use a different method such as structural equation modeling? Were factor loadings set to 0 or 1 or another value? Did you specify correlated or uncorrelated factors? Correlated or uncorrelated errors?

7) Did any items load significantly on more than one factor? How did you handle those items?

8) Do the scales relate to one another in the way that your theory would predict? For example, are the significant correlations the ones you expected? Why or why not? Add this to the discussion section.

9) I don’t understand your discussion of common method bias (Results paragraph 4). Please clarify what you were testing and how the result was interpreted.

10) It is possible (although perhaps difficult) to directly measure antibiotic overuse in children. Do parents give children antibiotics when they are ill with viruses? And can your scale identify the parents who engage in this behavior? Whatever its psychometric properties, PAPA is not useful unless it correlates with this behavior of interest. You touch on this in the last 2 paragraphs of the discussion section, but perhaps a more explicit exploration of this idea is necessary – how would you design additional studies to test the validity of PAPA?

11) Conclusion: Be careful not to overstate your results. Your study has validated a 5-factor structure of the PAPA and established its psychometric properties – no more, no less. You can’t know that PAPA will be important in worldwide research until you (or other scientists) establish that it correlates to problematic antibiotic use.

Minor Essential Revisions

1) In Background paragraph 7, provide a brief description of the previous studies of PAPA.

2) Please specify in the methods section the language in which participants completed the survey.

3) To improve readability of the Measures section, provide a brief description of each subscale with one sample item. Then list all items of the PAPA in the appendix, specifying which scale each item belongs to.

4) Explain what high scores and low scores on the measure mean (e.g., high scores reflect more accurate knowledge of antibiotic resistance). Are any items reverse-coded?

5) It might be useful to include a table reporting means and SDs for individual items.

Discretionary Revisions

1) Consider restructuring the Background section by putting paragraphs 4-5 above paragraph 2.

2) Ask a native English speaking colleague to review the manuscript for
readability and usage.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.