Reviewer's report

Title: The 18 Household Food Security Survey items provide valid food security classifications for adults and children in the Caribbean

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Reviewer: Marek Brabec

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General

Comments:
This paper is interesting both from subject-matter and from methodological points of view. Issue of food insecurity is undoubtedly of utmost practical interest all over the globe and its urgency in middle to low income countries is even greater than elsewhere.

It is well known that the food-related investigation presents many obstacles from field research to subtle and technical intricacies of the statistical modeling. It is clear that the authors are obviously aware of this fact as well as of its various practical consequences. They should be congratulated for trying to tackle various important methodological issues at several levels of the research effort. First, they start with appropriate (agreeably powerful) and nicely described sampling procedure (probability proportional to size) to draw individuals to be questioned. It is also appropriate that possible limitations of the sampling procedures are mentioned openly – e.g. the fact that children living in the same households were not identified and hence statistical methods correcting for their inter-correlation could not be employed. Correction for this correlation can be attempted in future studies – perhaps with non-negligible implications for standard errors and hence subsequent tests; this can be done either in a comprehensive statistical model describing the correlation more or less explicitly, or it can be done by “brute force” e.g. via bootstrap.

The authors ran rather sophisticated models for data analysis. Namely, they employed item response models via commercially available specialized package, based on a rather advanced method of parameter estimation (marginal maximum likelihood). The underlying model could be specified a bit more clearly in formal terms (statement of the model in the form of equations would be more useful than occasional references to the particular software options/directives invoked). On the other hand, what is really nice, is the fact that authors are very much aware of potential problem with sensitivity of the results to underlying statistical assumptions. As a precaution, they did what is usually termed by the catchy notion of “sensitivity analysis” (which was modestly avoided in the paper), to see whether the conclusions would change if the simple (and rather restrictive) 1PL model would be generalized in two (important) ways: to 2PL and to DIF. The paper discusses sensitivity analysis results in interesting and informative way – leading to a practically important conclusion that while there is statistically detectable difference between the models, the classification discrepancy (as the feature of highest practical interest in the current context) is very modest. Here, once again, it would be useful for a general reader to have a bit clearer statement of all three models (1PL, 2PL, DIF) in the form of (nicely comparable) equations (among other things, such a change would make the paper a bit more self-containing and easier to read for a wider audience).

Although the authors demonstrated nicely and in a formalized way that the model choice (within the 1PL, 2PL, DIF family) did not matter too much, it seems that the conclusion: “The 18 HFSS items may be used to classify food security status of adults or children in an English-speaking country where food insecurity and hunger are frequent.” is reaching a bit too far. As there might be many
more factors influencing the validity of the statement than those considered in this study, the wording should be perhaps a bit more cautious.

Technically, it might be both interesting and of practical interest to investigate the missingness patterns and mechanisms in future work. From the comment on page 5 ("Items were analyzed without imputing missing values."), it seems that the current analysis amounts to MCAR assumption, whose plausibility might be explored in future studies.