Reviewers report

Title: Urbanicity, hypothalamic-pituitary-adrenal axis functioning, and behavioral and emotional problems in children: A path analysis

Version: 0 Date: 13 Sep 2019

Reviewer: Fabian Streit

Reviewers report:

The authors present a very interesting and well designed study, investigating the link between urban upbringing and childrens' mental well-being, and whether this is mediated by HPA axis functioning.

Authors have pre-registered the article in OSF, which is good scientific practice.

Introduction:

There is evidence that selective migration (partially genetically driven) and socioeconomic factors contribute to the association of urbanicity and mental health. While this is only explaining a share of the variance, I think the first sentences of the introduction are misleading in this regard. Please refine this section.

The open science framework link for citation 25 is not publicly available. However it seems the work is already described in citation 24? Please clarify. I also think it would be better if all research question from the registration would be reflected as such in the article. In my view, preregistered RQ 1, 2, 3, 5, and 6 of the pre-registration are part of the current manuscript. Please elaborate why heart rate measures are not included in the present manuscript.

Methods

In the JOiN sample, the stress test was carried out either on midday or the afternoon. This should be tested as a covariate in the respective models.

I think the AUCg measures is problematic in regard to this point.

The calculation of the AUCs need to be explained in more detail, especially as missings were allowed in their calculation. This might result in different time frames. In general, using AUC with varying distances between measures creates a confounding with test duration/sample timing that should be addressed.
The distribution of the cortisol measures should be depicted in histograms, so that the reader can judge their distribution, as skewed distributions are common.

Please specify "normal day" for basal cortisol collection. Were week Vs. weekend days controlled for?

Please explain why for the decline BC1 and not BC2 was used for Join.

The variables correlating with HPA measures should be clearly depicted in the main manuscript.

Results

The number of missing values, and the number of subjects with complete measures for stress test and basal assessment should be clearly described.

It seems that the design of the authors was not the most powerful to test the more basic hypothesis, e.g. urbanicity/HPA axis measures are associated with emotional or behavioural problems (RQ1-4 in OSF). I suggest the run a meta analytic approach over both samples. This would strengthen the interpretation of the null finding, if still non significant.

Discussion

The interpretation that the exposure might have bit been sufficiently long to affect HPA axis functioning should be discussed in regard to the literature describing dose response effects of urban upbringing on mental health (e.g. Pedersen 2001).

Interpretation of power. Please consider more powerful analysis approaches.

Please describe the power analysis in the manuscript/supplements.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

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.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?  
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English  
Please indicate the quality of language in the manuscript:

Acceptable

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