Reviewer's report

Title: Examining the influence of gender, education, social class and birth cohort on cognitive tracking over time: a population-based prospective cohort study

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Reviewer: Darren M Lipnicki

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This short manuscript reports on how longitudinal change in MMSE scores in older individuals is affected by gender, education, social class, birth cohort and region of residence. The study addresses effects that are likely to be of interest to others, but there are issues I believe make the manuscript unsuitable for publication in its current form. My major concerns relate to how the methodology is described and a need for the authors to more clearly outline the implications of their study.

Major compulsory revisions:

1. MMSE scores are presented for a 1923-7 birth cohort up to the age of 95. Paragraph 2 of the Discussion and Conclusions section notes that “cohort effects were extrapolated across the age range”. This aspect of the methodology should be more clearly outlined in the Methods section, and the extent to which the conclusions are based on simulated or extrapolated data should be addressed.

2. The statistical analyses used are described very briefly, and I am unsure as to whether there is sufficient explanation given to fully describe them or allow for replication.

3. Reasons for including social class in the analysis are not provided in the Introduction.

4. The manuscript would benefit greatly by a more clearly apparent overarching rationale or message that follows through from the Introduction to the Discussion and Conclusions section. Are these particular effects being investigated to try and account for inconsistencies in the literature, or are there other theoretical and/or practical (or even clinically relevant) reasons?

5. The Discussion and Conclusions section seems more descriptive than interpretive. What are the implications of the findings?

6. The last paragraph of the Discussion states that “Alternative study designs are needed to provide definitive conclusions about cohort effects.” Do the authors have suggestions as to more appropriate designs, and is the use of extrapolated data a significant limitation of the current study?

7. I think the authors should discuss the extent to which the effects investigated are independent of one another, and whether relationships between these influenced the findings. To what extent do the effects of education and social class/occupation overlap? Are centre effects influenced by education or social
8. Paragraph 1 of the Methods section ends with “Written informed consent for participation in the study was obtained from participants or next of kin.” This leaves me wondering under what circumstances and in how many cases next of kin provided consent. It would also be appropriate to outline the exclusion/inclusion criteria for participation.

Minor essential revisions:

9. Some attention needs to be paid to punctuation, particularly a lack of commas. There are also a few other language issues that I am sure would be picked up with further proofreading, e.g., the last sentence of paragraph 2 of the Methods currently reads “Self-reported education were split into...”.

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

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests.