Author's response to reviews

Title: Association between life-course socioeconomic position and inflammatory biomarkers in older age: a nationally representative cohort study in Taiwan

Authors:

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Response to the Editor’s Comments:

1. Comment: The approach of the life-course SEP trajectory groups should be described in detail. The authors only noted somewhere in Results using 1-2 sentences, which is not sufficient. As this is the central theme of the current research, it deserves more elucidation.

Response:

We made the following modifications to elucidate the central theme of the current research.

Background section:

After saying that “The most frequently tested hypotheses of life-course SEP and health were the accumulation of risk, sensitive (or critical) periods, and social mobility.”, we further elaborate that “The accumulation risk model focuses on the total cumulative exposure to SEP throughout a life course, whereas the sensitive or critical period entails the SEP of a certain period in a life course having stronger effects than those of other periods. The social mobility model describes the trajectories of SEP that people are involved in through their life span and is often defined as inter-generational movements of social position from family of origin to adulthood. The pattern of social mobility were found to be significantly associated with health in later life. The health of people who remained stable in an advantaged position is likely to be better when compared to that of those who moved upward from a disadvantaged to an advantaged position. The health of who remained in the disadvantaged position is likely to be worse than that of those who moved upward from a disadvantaged to an advantaged social position.” (Background section, line 6, page 4)

Methods section:
We make it clear at the beginning of the “SEP throughout a life course” by saying that “This study takes the life course approach by incorporating exposure in early childhood to adulthood and older age.” (Methods section, line 3, page 7)

Later in the paragraph of Statistic Analysis, we add “The group-based trajectory approach we used involved fitting a polynomial model for each group. SEP of each group of participants over time is described using the binary logit distribution. The probability of staying in high SEP is directly measured through the proportion of individuals within each group staying in high SEP at a given time point.” (Methods section, line 13, page 11)

Results section:

We replace the sentence “Three distinct SEP trajectory groups were determined(Figure 1)” with “Three distinct SEP trajectory groups were determined to describe the pattern of social mobility that the participants were involved in through their life span from family of origin to adulthood and older age (Figure 1).” And add a sentence saying that “The results showed a social gradient in level of inflammation that runs from top to bottom of the SEP trajectories.” (Results section, line 14 & 21, page 12)

Conclusion section:

Not only saying that “Our data support the notion that childhood SEP may act either as a sensitive period or as part of the accumulation of risk.” we add that “This study demonstrates the social inequalities in population health. The health of people who remained stable in an advantaged SEP is better when compared to that of those who remained in the disadvantaged SEP or those who upwardly moved from a disadvantaged position to an advantaged position.” (Conclusion section, line 7, page 18)

2.Comment: Related to Comment 1, the life-course SEP trajectory groups was based on four points of SEP in different life stage, which is good. However, the dichotomization of four SEP variables at different life stages from three categories will cause information/trajectory loss. Thus, to me, the current outcome of the life-course SEP trajectory group is artificial, or at least incomplete. When the authors used the three-category SEP or even original category of each SEP at different life stages, the outcomes of the life-course SEP trajectory groups will likely be different. I suggest the authors try these approaches (categorization of four SEP variables) in addition to the current simplest approach to see the difference. Also consider making few of the new or current (dichotomous) results as appendix if needed. In comparison between different approaches/results, if the authors found that their current approach is better than other approaches, then sound justification is needed, and I add one of the others as an appendix.

Response:
The identification of trajectory groups is an inductive approach that allows the data to ‘speak for themselves’ by identifying groups of individuals whose SEP follows a similar course over time, highlighting differences and similarities between these individuals which call for explanation, and providing a foundation on which later modelling can be based. In this study, the main focus is to identify the possible upward, downward or stable trajectories for later modelling. Due to the constraints of limited sample size, we just dichotomized the four SEP variables at different life stages.

3. Comment: Figure 1: XY axis should have labels. X should be age. I do not know the meaning of Y. The authors should explain it.

Response:
We have labeled the XY axis in Figure 1 accordingly.

4. Comment: In abstract, the authors should note the sample size, not just its percentage.

Response:
The output of a group-based trajectory model includes estimated probabilities of group membership for each individual and each group and an estimated trajectory curve over time for each group. Thus we just reported the trajectories of life-course SEP were identified within the total sample number of percentage of each group.

5. Comment: In supplementary, the flow chart should highlight the sample of the present research, while remove the highlights what is irrelevant of the present study.

Response:
We have revised the flow chart in the supplementary. As mentioned in the Study population and protocol, data of this study were obtained from the Social Environment and Biomarkers of Aging Study (SEBAS), which was an extension of the population-based Taiwan Longitudinal Survey of Aging (TLSA) that began in 1989 [1]. A random subsample of respondents who completed the 1999 TLSA survey were invited to participate in the first wave of SEBAS in 2000. Our analysis focused on the second wave of the SEBAS conducted in 2006, which comprised the surviving participants from SEBAS 2000, aged ≥60 years in 2006, and a randomly selected subset of a younger refresh cohort of the TLSA in 2003, aged 50–57 in 2003 and 53–60 in 2006, resulting in a nationally representative sample of adults aged ≥53 years.

A total of 1036 participants with available SEP data for at least of one time point were included in the current study. Then, a total of 988 participants with available SEP data for four time points were classified into different trajectory groups.
Reference