Reviewer's report

Title: Cognitive Health among Older Adults in the United States and in England

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Reviewer: Michael J Valenzuela

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Summary
This paper first reports on descriptive statistics related to cognition, sociodemographic variables and general pertinent medical history in two very large cross-sectional samples from the UK and USA. The main finding was significantly better cognitive function in the US sample, despite increased rates of cardiovascular-related risk factors. Multivariate modeling was then employed to try to determine risk- and protective-factors associated with the US cognitive advantage. No single factor, or combination, could clearly explain why older Americans seemed to out-perform older UK citizens.

General
This is a well written and interesting study comparing results from two large samples from the UK and USA using similar cognitive metrics. The finding of a significant cognitive advantage by older Americans over UK citizen is intriguing, and even counter-intuitive given the noted greater burden of cardiovascular-related risk factors in the USA population. Unfortunately, despite the evident power of the sample, multivariate modeling could not clearly identify which factors were driving this result. I therefore have some questions for the authors which may help to clarify and improve the manuscript.

Major
1. The authors have described their samples as ‘nationally-representative’. The US has a large Afro-American and Latino component to their population, but there was no data presented to support the claim that the HRS was similarly structured.

2. As acknowledged, the main methodological difference between the samples was that 71% of HRS respondents completed the cognitive measure by phone, whilst 0% of the ELSA sample did. This may have led to a systematic bias. Within the HRS alone, how did those with phone-complete vs in-person assessment compare in terms of cognitive and background variables?

3. Table 2 could be supplement by frequency plots for the combined scale and cognitive-subcomponents in order to determine if cognitive data were normally distributed. Was the observed mean difference supported by a shift in distribution central tendencies, or skew?

4. How were the subjective assessments of memory distributed? I suspect these were highly non-normal, given the authors decided to selectively compare “fair”
vs “poor”. Why not median split or compare (excellent + very good) vs (fair + poor)? This is the weakest part of the analysis and the paper would in fact be improved by removing it entirely.

5. Please include details of derivation of sample weights to allow a proper assessment of methods

6. The results of modeling were, in the end, unenlightening. The relative difference between countries at the univariate level was -1.43, and after inclusion of 12 possible explanatory variables was still -1.43! The inability for linear regression models to account for non-linear predictor-outcome, and predictor-predictor contingencies, needs acknowledgement. A minor issue would be in Table 4 to make UK the reference group so as to avoid so many negative numbers which detracts from readability.

7. The suggestion that more prevalent (and aggressive) treatment of hypertension in the US, despite the higher rates of cardiovascular disease, may be one reason for the US cognitive advantage is really very interesting. Can the authors provide more empirical data to support the idea? Could they, for example, compare cognitive profiles between those with untreated hypertension vs treated hypertension in the two countries (after covariate control), and see whether there is an interaction?

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.