Author's response to reviews

Title: Explanations of socioeconomic differences in changes in physical function in older adults: results from the Longitudinal Aging Study Amsterdam

Authors:

Annemarie Koster (a.koster@zw.unimaas.nl)
Hans Bosma (hans.bosma@zw.unimaas.nl)
Marjolein I. Broese van Groenou (mi.broese@fsw.vu.nl)
Gertrudis I.J.M. Kempen (g.kempen@zw.unimaas.nl)
Brenda W.J.H. Penninx (Brendap@gqzba.nl)
Jacques TH.M. van Eijk (j.vaneijk@zw.unimaas.nl)
Dorly J.H. Deeg (djh.deeg@vumc.nl)

Version: 3 Date: 12 May 2006

Author's response to reviews: see over
Dear Editor,

March 31, we received your decision letter in which you explain that you give us the opportunity to revise our manuscript according to the reviewer’s comments (MS:1209846251851164).

We have now revised the paper following the reviewers’ comments. Below you will find the specific reply to each reviewer’s comment. Any changes and new text are in red.

I hope you will reconsider our paper in its present form and find it acceptable for publication in your journal.

Yours sincerely,

Annemarie Koster
Response to comments reviewers

Reviewer 1: Mai Stafford

Major Compulsory Revisions

None

Minor Essential Revisions

1. The main aim of the present study is to examine the contribution of a number of potential explanatory factors to explain SES differences in physical function. In preliminary analyses we tested interactions with SES and age and SES and sex. Because of the significant interaction between SES and age we stratified the analyses for age. To study SES differences in both younger-old and older-old adults was not an a priori aim of the study. We choose two age groups with a cut-off of 70 years. The cut-off was close to the median age (69 years) in the study population. In this way we had two about equally large groups, both with an age range of 15 years. We agree with the reviewer that the cut-off can also based on theoretical information rather than empirical information.

2. Two commonly used measures for SES were used in this study: education and income. These measures represent different dimensions of SES. Education is often regarded as an indicator of fist choice because it is normally fixed early in life; problems of reversed causation are much less serious. Educational differences may, however, reflect cohort differences in opportunities to follow higher education, particularly among the oldest old. Therefore we also included a second measure for SES: household income, representing SES in a later life stage. In this study similar results were found across both SES indicators. A comparison of different indicators of SES in old age by Grundy and Holt (JECH, 2001) showed that education paired with a deprivation indicator met the criteria best. This reference was added to the measures section where the SES indicators are described (page 5 of revised manuscript, line 11).

3. Data on behavioral factors were missing because these data were collected in a medical interview in which 86% of the study sample took part. This information was added to the
methods section where lifestyle factors are described as part of the covariates in this study (page 6, lines 21-23). Because of the large number of missing data on behavioral factors, we created a missing category for this group. However, the missing data may have led to misclassification, especially in the older age group as there were more missing data on behavioral factors than in the younger age group. It remains unclear how this may have affected the contribution of behavioral factors in the explanation of the SES differences in physical function. In a sensitivity analyses, we showed that the contribution of behavioral factors is very similar when we excluded persons with missing data. We added this to the fourth paragraph of the discussion (page 13, lines 14-17).

4. We agree with the reviewer that the three groups of explanatory factors probably do not have an independent contribution to the explanation of SES differences in physical function. The mechanism are probably interrelated, indicating that some mechanisms work through others rather than work independently from each other. This may have had consequences for the estimation of the exact contribution of each group of explanatory factors in the explanation of SES differences in physical function. However, the contribution of diseases, behavioral, and psychosocial factors together is not affected by whether these factors are interrelated or not. We added this issue to the fourth paragraph of the discussion (page 13, lines 2-9).

5. Diseases explained part of the SES differences in physical function in the youngest age group. The average reduction in the lowest SES groups was 35%. We added this information to the results section (page 10, lines 1-4). In the oldest age group, diseases only had a minor contribution in reducing the SES differences in physical function. Because of the role of diseases in the youngest age group, we cannot state that diseases did not explain much of the SES inequalities. As we acknowledge at the end of the fourth paragraph of the discussion (page 13, line 17-19), had more objective information on diseases been available, the reduction in the strength of the SES effect might have been larger. We do not know if the relatively small numbers of, for example stroke and diabetes mellitus may have led to a small contribution of diseases in the explanation of the SES inequalities.

6. We agree with the reviewer that physical activity and BMI could have been considered as continuous variables in stead of categorical. The contribution of these factors is, however, very similar when we add these variables as continuous variables to our models. We used categorical variables for the ease of interpretation corresponding to the presentation in table 1.

7. Physical activity is associated with a decline in physical function in both younger-old and older-old adults. However, table 1 shows that the association between physical activity and SES is stronger in the youngest age group than in oldest age group. Persons
younger than 70 with a high SES were significantly more physically active compared to the lowest SES groups. In the highest age group the association was less clear. BMI was associated with a decline in physical function in both age groups, as well as with SES. Given the minor contribution of BMI in the oldest age group, these associations were less strong compared to the youngest age group.

8. In table 3 and 4, we present the intercept and slope for each SES category including the p-value for each category. The p-value clearly shows the difference between the medium and the low SES group. Compared to the highest SES group, the intercept and slope are more often significantly different in the lowest SES group than in the medium SES group. This is demonstrated by the p-value for each category. When a single p-value for the statistical significance of a group of dummy variables will be presented, we cannot distinguish the significance between the medium and low SES group.

9. We removed figure 2 in figure 1 title; this was a typo.

Discretionary Revisions

1. Interactions between SES and sex were not statistically significant (page 8, lines 8-9) indicating that the effect of SES on physical function was not different for men and women. Therefore, we did not stratify for sex.

2. We agree with the reviewer that a few references should be added, so we did (page 4, line 2).

3. Data on behavioral factors were missing, because these data were collected in a medical interview in which 86% of the study sample took part. (See also comment 3 above) We have not considered other methods to replace missing values. However, in a sensitivity analyses, we showed that the contribution of behavioral factors is very similar when we exclude person with missing data. Missing values for psychosocial factors were replaced by group means, which could have led to an attenuation of the effect of these factors in explaining the SES differentials. In additional analyses, however, in which subjects with missing values on psychosocial factors were excluded, the contribution of these factors in the explanation of SES differences in physical function was also very similar. This information was added to the fourth paragraph of the discussion where the drawbacks of the study are discussed (page 13, lines 9-17).

4. In the fourth paragraph of the discussion, we acknowledge that the contribution of explanatory factors could have been larger if these factors had also been considered longitudinally. Longitudinal data are not available for all variables used in this study. We
have tested interactions between each explanatory factor and longitudinal time. However, the coefficients were difficult to interpret which may be due to the complexity and potential over-fitting of the models and, therefore, did not add to the explanation of the slope differences. Something similar will probably happen when the explanatory variables will also be considered longitudinally.

5. As the reviewer suggested, we have added a brief description for each model in table 3 and table 4.

Reviewer 2

Reviewer: The main problems with the paper are the presentation and interpretation of the multilevel growth curve modeling, which makes it hard to determine what was found or why, though the essence of that was in the descriptive data in table 2. As always with such problems, they stem in part also from some lack of clarity and precision up front as to the main objectives or questions motivating the paper.

Table 2 clearly shows the mean score at each measurement for each SES group and for the two age groups. This is, however, a simplified model and still unadjusted. We, therefore also presented the results of the multilevel analyses. Multilevel analyses has the advantage that it is a suitable technique for repeated measurement analyses. We agree with the reviewer that the interpretation of the coefficients of the multilevel analyses is difficult. For this reason we added figure 1. This figure shows the physical function score over 9 years of follow-up for each SES group.

Hopefully we clarified the paper through use of the comments of the other reviewer.