Author's response to reviews

Title: Group involvement and self-rated health status among the Japanese elderly: an examination of bonding and bridging social capital

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Author's response to reviews: see over
Dear Drs. Pafitis and Clays,

Thank you for your careful evaluation and providing us another opportunity to submit the revised version of our manuscript. I, along with my coauthors, would like to re-submit the revised manuscript entitled “Group involvement and self-rated health among the Japanese elderly: an examination of bonding and bridging social capital” (2106199835102961) for your consideration as a research article. In accordance with the suggestion from Reviewer 1, we slightly modified the title.

We take public responsibility for its validity and final presentation as an original publication. We declare that there are no conflicts of interest. We state here that this is an original work, which has not been published in any journals, either in whole or in part, or is not under review elsewhere. This manuscript follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations.

We thank all the reviewers for their helpful comments, which we feel have improved our manuscript. We hope that the manuscript is now suitable for publication in *BMC Public Health*. We look forward to your positive response soon.

Yours sincerely,

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Reviewer 1
Dear Dr. Murayama:

Thank you very much for your thoughtful review and positive evaluation of our article. We have revised our article following your helpful comment. Our response is described in normal font following the reviewer’s comment in boldface.

Major Compulsory Revisions

Introduction
1. I agree that this study has an important contribution to the field of public health. Authors can review previous studies regarding bonding/bridging social capital and health, but you should clearly state the reason why this study is necessary (What is the problem of previous studies? What kind of study is needed?).

Response:
Thank you for your suggestion. In accordance with your comment, we added the reason why this study is necessary in the Background section as follows:

(Page 6 line 15)
It is worthy to note, however, that their findings cannot be necessarily applied to social capital in a community context since they operationalized bonding social capital with a measure of trust that does not uniquely refer to communities and bridging social capital with a measure of reciprocity, both in different social contexts. Indeed, no studies have examined the possible differential effects of bonding and bridging community social capital on health among the elderly. As remarked above, it would be of a particular interest to investigate them in a “super-aging” society like Japan.

Methods
2. Regarding bonding/bridging social capital items, I have some questions. (i) Did you consider the frequency of participation in group activity? If not, why didn’t you consider it?

Response:
Unfortunately, the information about the frequency of participation in group activity is not available, mainly due to space limitation of the questionnaire. In accordance with your comment, we mentioned this limitation in the Discussion section as follows:

(Page 15 line 12)
Furthermore, it may be also beneficial to employ more robust assessment of group involvement, by specifying the frequency of participation for each organization.

(ii) Did the respondents answer “diverse” or “similar” for every group they belonged to (a-f)? So, at individual level, can the number of total group involvement be expressed as the sum of the number of bonding group involvement and the number of bridging group involvement?

Response:
Yes, as you assumed, the respondents answered “diverse” or “similar” for every group if they belonged. So the number of total group involvement can be expressed as the sum of those of bonding and bridging group involvement. We hope that readers can understand this from the following sentences:

(Page 8 line 13)
Respondents were asked to assess whether each type of group they attended was either homogeneous or heterogeneous in its social composition, thus differentiating each group into bonding or bridging social capital [3, 26].

(Page 8 line 22)
The number of bonding/bridging social involvements was calculated separately, and then summed to provide the total number of group involvements.

(iii) When the respondents belonged to two organizations or more in the particular group (among a-f), how did they answer the question? For example, some people may participate in more than two groups of sports/hobby/culture circle. Moreover, regarding alumni association, people may belong to some links of alumni associations (e.g., junior high school, high school and university). In this case, one group may have similar composition, while another may have diverse composition.

Response:
We asked respondents to select the most appropriate answer from the following three choices for each six type of groups: “I do not participate in this type of group.” “I participate in this type of group, and their composition is diverse with respect to gender, age group, and occupational background.” and “I participate in this type of group, and their composition is similar with respect to gender, age group, and occupational background.” Therefore, when the respondents belong to two or more organizations in each type of groups, they are expected to choose the most influential organization. In accordance with your comment, we decided to
state this point as an implication for future studies in the Discussion section as follows:

(Page 15 line 10)
Further studies are warranted on the precise nature of group member diversity, preferably for each organization.

(iv) Authors classified the number of groups into four categories (0/1/2/3+). However, regarding bridging social capital, more than 1,200 respondents have “high level” of bridging social capital. Do you think this classification was valid? (Please explain why you set “3+” as high level.)

Response:
We used these categories following Iwase et al (2012), which we believe could facilitate the comparability of the present findings. We revised a sentence to clearly explain this in the Methods section as follows:

(Page 8 line 23)
To evaluate the dose-response relationship between social capital and self-rated health, the number of groups that the respondents were active in were classified into four levels following a previous study [6]: none, one, two, and three or more, which corresponded to ‘none’, ‘low’, ‘middle’, and ‘high’ social capital.

Results
3. page 9, lines 12-14…Difference of the threshold for the beneficial effect of bonding/bridging social capital between men and women is very interesting, I think. Please discuss this point.

Response:
We agree. In accordance with your suggestion, we decided to discuss this point in the Discussion section as follows:

(Page 13 line 13)
Our findings also suggest that the “threshold” for the beneficial effect of bonding social capital is different in men and women: for women, bonding social capital at the middle level was not significantly associated with better self-rated health, but it was in men. Although the reason remains unclear, there is a possibility of social desirability among women [38], i.e., elderly women may have tended to over-report the number of group involvement, compared to elderly men.
Discussion
4. page 10 line 3 to page 11, line 3...These discussions about the relationship between bonding/bridging social capital and self-rated health seem little bit lame. Authors must quote some appropriate references.

Response:
We agree. By adding citations to some recent studies, we revised these paragraphs to deepen discussions on our findings as follows:

(Page 12 line 10)
The same questionnaire on social capital was used by Iwase et al. [6] on a general population (20–80 years old), who found that Japanese women benefited more from bridging social capital and men may benefit more from bonding social capital. Interestingly, this pattern was nearly reversed in the present study, which found that elderly men benefit from both bonding and bridging social capital, whereas elderly women benefit from bonding social capital. It is likely that today’s elderly men in Japan sought and enjoyed stronger associations with their colleagues until retirement in the “close-knit” nature of their companies [34]. While increasing emphasis is placed on cooperation and collaboration inside the workplace [35], they have gained more benefit from bonding social capital from ‘similar’ people in their companies, as implied in the proverb “birds of a feather flock together” [36]. When this strong commitment to the company is lost after retirement, however, they may experience a variety of changes in living arrangements, which leads to changes in physical and mental health [37]. While favorable effects of bonding social capital could remain after retirement, the loss of frequent connection with colleagues could create new challenges for them to establish relationships with community residents, resulting in involvement in new groups with greater diversity in composition respect to gender, age, and previous occupation. This may explain why elderly men benefit from both bonding and bridging social capital.

The findings about elderly women from the present study may be interpreted from the perspective of flexibility to tolerate and acknowledge different opinions: although they could get along with diverse neighbors in early adulthood, their flexibility may decline with age. Another explanation may be that most women subjects had not been employed and that they have been involved in group activities in the communities over a long time. Even though they initially felt that the group was ‘diverse’, it might become more ‘similar’ over time. The adverse effect of bonding social capital tended to be referred in disadvantaged communities [1].
5. Authors mentioned that high bridging social capital was associated with self-rated health after adjusting for bonding social capital (OR=0.62). And any substantial change of the association was not observed (page 9, lines 14-17)… My understanding is that, in this model, both bonding and bridging social capital was negatively associated with self-rated health both in men and women. Is this correct? I think this result is interesting. The study by Iwase et al. (2012) showed that bridging social capital was inversely associated with self-rated health both men and women, but the association between bonding social capital and self-rated health was not statistically significant in their final model (Model 2). That is, the association between bonding social capital and self-rated health could be observed among the elderly, while this association could be found among the general population (20-80y). Please present this not-shown model as “Model 4” on Table 4, and discuss this result.

Response:

As you mentioned, when we mutually adjusted for bonding and bridging social capital, both of them were negatively associated with self-rated health in both sexes. In accordance with your comment, we decided to show these results as Model 4 in Table 4 and discuss the differential effects between the elderly and the general population in the Discussion section as follows:

(Page 13 line 19)

Notably, unlike a previous Japanese study of general population [6], our findings suggest that bonding social capital is associated with better self-rated health among the elderly men and women, even after adjusting for bridging social capital. It has been suggested that strong bonding social capital may have a harmful effect on health since it imposes a burden on people’s already stressful lives [4]. Thus, our findings suggest that the “dark side” of bonding social capital may be outweighed by its “bright side” among the elderly. This finding may be partly attributed to a cohort effect; our study subjects were born before the end of World War 2, and this generation may highly value the tradition of social commitment, even when they are required to contribute much more to the groups they belong to.

6. page 11, lines 12-17… If it is one of the advantages of this study to include personality (type-D personality) as covariates, please add the description about the importance to adjust for this when examining the relationship between social capital and health in the Introduction.

Response:
Thank you for your suggestion. We decided to briefly explain it in the Background section as follows:

(Page 7 line 3)
To address an issue of unmeasured confounding between social capital and health, we adjusted for type-D personality in this study, which consists of negative affectivity (i.e., the tendency to experience negative emotions across time/situations) and social inhibition (i.e., the tendency to inhibit the expression of emotions/behaviors in social interaction to avoid being against others) [22, 23].

Overall
7. In this paper, authors used self-rated health as outcome. However, you often used the term of “health status” or “health” in the title, abstract and the text. Please clearly mention “self-rated health”.

Response:
In accordance with your comment, we use “self-rated health” throughout the revised manuscript.

Minor Essential Revisions
Title
8. As I mentioned above, please change “health status” to “self-rated health”.

Response:
In accordance with your suggestion, we changed the title.

Abstract
9. Please change “health” and “better health” to “self-rated health” or “better self-rated health”.

Response:
In accordance with your suggestion, we changed them.

10. Authors put “type-D personality” as a keyword. However, this term has not showed up in the title and abstract. If you make “type-D personality” a keyword, please mention about this in the abstract.

Response:
We agree. In accordance with your comment, we decided to delete “type-D personality” as a keyword.

Methods
11. page 5, lines 22-23, ”Also excluded were those….than 5 years”…Why did you exclude these participants? Please describe the reason.

Response:
We employed this procedure to hopefully “wash out” the possible effect of social capital of the communities where they used to live. We decided to explain this in the Methods section as follows:

(Page 7 line 19)
Also excluded were those who had not been resident in the municipalities for more than five years. We employed this procedure to hopefully “wash out” the possible effect of social capital of the communities where they used to live.

12. page 7, line 13…I think you had better to add “height”.

Response:
Thank you. In the analysis, we adjusted for overweight, which is defined by using BMI. Thus, we corrected the sentence as follows:

(Page 9 line 11)
In line with previous studies [5, 6, 29 -31], the following variables were considered as relevant confounders: age, educational attainment, smoking status (never/former, current), frequency of alcohol consumption, overweight, and living arrangement.

13. page 7, lines 19-24…More explanation about type-D personality is necessary (number of items, reliability [Cronbach’s alpha] in this study, etc.). Did you use the scale of the Japanese version which examined the reliability and validity of the scale? If so, please explain that.

Response:
We used a 14-item Type D Personality Scale, which was translated into Japanese by the authors. Although its reliability and validity have not been rigorously examined yet, Kasai et al (2013) recently reported that type-D personality is associated with psychological distress and poor self-rated health among the elderly by using the same dataset. In accordance with
your comment, we added more explanation about type-D personality in the Methods section as follows:

(Page 9 line 20)
In addition to these variables, we adjusted for type-D personality since it could act as a common prior cause of low social capital and poor health. Type-D personality was first developed in relation to chronic heart disease outcome [32]. In this study, we assessed type-D personality by using the Japanese version of 14-item Type D Personality Scale, which is comprised of the two components: negative affectivity and social inhibition [25]. The overall Cronbach’s alpha as an indicator of reliability was 0.8823.

14. page 8, line 5…Did you adjust for weight? or BMI?

Response:
We apologize for the confusion. In accordance with your comment, we modified the sentence to clearly state that we adjusted for overweight as follows:

(Page 10 line 10)
After examining a crude association (Model 1), age (continuous), educational attainment, smoking status, frequency of alcohol consumption, overweight, and living arrangements were adjusted for in Model 2.

Results
15. page 8, line 15 and16, “30.0%” and “29.4%”…On tables, you showed the values to two places of decimals.

Response:
Thank you. In accordance with your comment, we corrected these typos as follows:

(Page 10 line 22)
Of the 11146 subjects, the prevalence of poor self-rated health was 29.95% for men and 29.44% for women.

16. page 8, line 23, “Most of the group…lower odds for poor health”…Did you indicate overall trend of the association, regardless of the statistical significance. If so, please explain exactly.

Response:
We apologize for the confusion. To explain the findings more precisely, we modified the sentences as follow:

(Page 11 line 6)
Most of the group involvements were (though not significant) associated with lower odds for poor self-rated health, even after adjusting for all covariates (Model 3).

17. page 9, lines 1-4…Did you argue about this result in the Discussion? If not, I think this can be removed.

Response:
In accordance with your comment, we decided to remove the sentence.

Tables
18. Table 2…Authors showed two kinds of percentage (in the columns of “total” and “poor health”). However, these values had different meaning (One indicated the prevalence in total sample, and the other indicated the proportion of poor self-rated health in each group of “number of group involvement”). Therefore, any explanation on footnote would be helpful.

Response:
In accordance with your comment, we added footnotes as follows:

(Footnote of Table 2)
\( ^{a} \) We show proportions of each category among the total numbers.
\( ^{b} \) We show proportions of those who reported poor health respondents among each category.

19. Table 3…Please show the prevalence (%) of “poor self-rated health” in each category (no involvement/bonding social capital/bridging social capital) in men and women.

Response:
In accordance with your comment, we added the prevalence (%) of “poor self-rated health” in each category in Table 3.

20. Table 3 and 4…Some values are integer number (e.g., 1) or number with first decimal place (e.g., 0.6).
Response:
In accordance with your comment, we corrected these typos. Thank you.
Reviewer 2

Dear Dr. Clercq:

Thank you very much for your thoughtful and thorough review and positive evaluation of our article. We have revised our manuscript in response to your suggestions. Our responses are described in normal font following reviewer’s comments in boldface.

Major revisions
1. Title:
The title describes the paper well.

Response:
Thank you. We slightly modified the title in accordance with the suggestion from Reviewer 1.

2. Abstract:
The abstract reflects the content of the paper well.

Response:
Thank you very much. In accordance with your following comments, we thoroughly revised the abstract. Please see our responses below.

3. Introduction:
This section needs major revisions. The research question should be situated more clearly within the existing literature of bonding and bridging social capital. A better structured introduction should illustrate the originality of the proposed research question and the empirical contribution to the field.

Response:
In accordance with your comment and Reviewer 1’s comment 1, we thoroughly revised the Background section. Please see following responses.

First paragraph: OK, rationale for studying bonding/bridging social capital in Japan
Second paragraph: an empirical example of bonding/bridging social capital in Japan, so those lines could be added to the first paragraph.

Response:
In accordance with your comment, we combined these two paragraphs.
Third paragraph: OK, social capital and health among elderly
First, the concept of “neighborhood social capital” is introduced. Why? Because of greater exposure and vulnerability compared to other age groups.
Second, the authors mention a study on “bonding/bridging social capital” and elderly. But, how does “bonding/bridging social capital” theoretically relates to “neighborhood social capital”? Are bonding/bridging different dimension of social capital in a neighborhood context? How was this conceptualized in that particular study? Norstrand and Xue (2012) operationalize bonding social capital with a measure of trust that does not uniquely refer to neighborhoods and bridging social capital with a measure of reciprocity, both in a different social contexts (trust in family/friends/neighborhood and reciprocity in organizations).
This should be explained more clearly since the authors state that this is the only study on the specific topic of the manuscript under consideration.
Then, another new term is introduced: “community social capital”. Are “neighborhood” and “community” the same? The authors cite studies in other contexts (workplaces and schools) and other populations (adolescents and working population).
Finally, five studies are listed on social capital and health among elderly in Japan. This is all really confusing. The whole paragraph needs editing.

Response:
Thank you for your thoughtful comment. In accordance with your suggestion, we thoroughly revised the current second paragraph. The concept of bonding/bridging social capital is applicable to a variety of social contexts, including communities, workplaces, and schools. In a recent study from China, however, Norstrand and Xu defined bonding and bridging social capital in different contexts. To clearly explain this point and to enhance readability of the Background section, we decided to move the sentences about their study to the current third paragraph. We used “neighborhood” and “community” interchangeably, and we apologize for the confusion. In the revised manuscript, we consistently use “community”. In addition, we deleted citations to the studies in other contexts. We hope that with these modifications, the current second and third paragraphs in the Background section are now more readable.

Although most developed countries (including Japan) now face multiple challenges associated with population aging and overall population decline, few studies have examined the effects of community social capital on health, specifically among the elderly. It has long been hypothesized that the elderly may be particularly vulnerable to the health-enhancing or health-damaging aspects of residential environments [7]. They may also need to rely on community resources for services, and their daily activities (e.g.,
food shopping, food consumption, recreation, and social interactions) may often take place in the vicinity of their homes. Hence, both their exposure to community conditions and the degree to which those conditions are relevant to their health may be greater than they are for other age groups [8]. For such a reason, the effect of social capital could be important for the elderly. Given the global trend of population aging, there is an interest in further investigating the association between community social capital and health among the elderly in Japan [9-12], which precedes other countries in experiencing a “super-aging” society [13]. The findings would also be of interest as Japan has built its own particular style of social cohesion owing to its history [14, 15]. To date, five studies have examined the association between social capital and health among the elderly in Japan, all of which are from the Aichi Gerontological Evaluation Study (AGES) or the Ohsaki Cohort 2006 Study [16-20]. Although three of these five studies examined the effects of social capital on dental health [16, 18, 19], these previous studies have implied beneficial effects of social capital on general health among the elderly. For example, a cohort study based on the data of AGES suggested that a smaller friendship network was significantly associated with higher all-cause mortality in both sexes [17].

To our knowledge, only one study from China has examined the association between social capital and health in the elderly by distinguishing bonding and bridging social capital. Norstrand and Xu [21] used cross-sectional data from 1250 subjects aged 65 or older and found that bonding social capital (which was measured as trust on family members, friends, neighbors, etc.) is associated with better physical and emotional health among urban residents. By contrast, they found no clear association between bridging social capital (which was measured as the extent to which people help each other in organizations they have participated in) and health outcomes. It is worthy to note, however, that their findings cannot be necessarily applied to social capital in a community context since they operationalized bonding social capital with a measure of trust that does not uniquely refer to communities and bridging social capital with a measure of reciprocity, both in different social contexts. Indeed, no studies have examined the possible differential effects of bonding and bridging community social capital on health among the elderly. As remarked above, it would be of a particular interest to investigate them in a “super-aging” society like Japan.

Last paragraph: please remind the reader concisely about the different arguments. Why do we need more research on bonding/bridging social capital and elderly in Japan? Note that the differential social capital effect by sex was not addressed in the introduction.

Response:
In accordance with your comment, we concisely explain the rationale of this study in the last paragraph. We also state that we a priori decided to analyze the data for each sex separately as follows:

(Page 6 line 23)
Therefore, we sought to investigate the association between bonding and bridging community social capital and self-rated health, using a large population-based sample of elderly Japanese people. Following a previous study from Japan [6], we conceptualized the two dimensions of social capital from the perspective of group involvement and examined the association for men and women separately. To address an issue of unmeasured confounding between social capital and health, we adjusted for type-D personality in this study, which consists of negative affectivity (i.e., the tendency to experience negative emotions across time/situations) and social inhibition (i.e., the tendency to inhibit the expression of emotions/behaviors in social interaction to avoid being against others) [22, 23].

4. Methods:
Good description of the sampling methodology.
Social capital measure: the present study measured group involvement, but the introduction doesn’t focus on this. Norstrand and Xue (2012) used a cognitive approach (perceived reciprocity) whereas the present work measures the structural aspects of social capital.

Response:
Thank you. In accordance with your comment, we state that we used group involvement as a measure of social capital in the last paragraph in the Background section as follows:

(Page 6 line 23)
Therefore, we sought to investigate the association between bonding and bridging community social capital and self-rated health, using a large population-based sample of elderly Japanese people. Following a previous study from Japan [6], we conceptualized the two dimensions of social capital from the perspective of group involvement and examined the association for men and women separately.

Health measure: The authors state that “In a study of Japanese elderly, Nishi et al. [27] found a significant sex difference in the predictive ability for self-rated health for mortality, even after adjusting for social and medical factors. Thus, to examine effect modification by sex, the data were analyzed by stratifying by sex throughout the
results.” Is this the reason to stratify the analysis? How does modification of the self-rated health – mortality relation by sex relates to the present analysis of social capital effects on health?

This is important since your main conclusion is about differential social capital effect by sex.

Response:
We fully agree. In accordance with your comment, we deleted the sentences about a study by Nishi et al. in the revised manuscript. Following Iwase et al. (2012), we a priori decided to examine the association between bonding/bridging social capital and self-rated health for each sex separately. We clearly explain this in the last paragraph in the Background section. We also revised the abstract to clearly state this.

(Page 2 line 4)
By using a large population-based sample of elderly Japanese people, we sought to investigate the association between bonding and bridging community social capital and self-rated health for men and women separately.

(Page 7 line 1)
Following a previous study from Japan [6], we conceptualized the two dimensions of social capital from the perspective of group involvement and examined the association for men and women separately.

Analysis: Please note that besides bonding/bridging and structural/cognitive, other important distinctions exist within the social capital concept. You should explain your single level analysis strategy and situate it as an solely individual conceptualization of social capital (versus ecological or multilevel approach).

Response:
We appreciate your comment. In accordance with your comment, we added sentences at the beginning of the Statistical analyses section as follows:

(Page 10 line 4)
Since we employed individual conceptualization of social capital by using group involvement, we used a single-level analytical strategy throughout the study. Meanwhile, when social capital is conceptualized as a group attribute, multilevel models are relevant in social capital research [33].
5. Results:
Table 4: insert ‘poor’ before health in the title

Response:
In accordance with your comment, we inserted “poor” in the title.

Table 4: For women, why do you interpret OR’s that are not statistically significant?
The finding is that bonding/bridging is not associated with health in women. However, in the mutually controlled model bridging is significantly related to health in women. Did you check your model assumptions? Multicollinearity between bonding/bridging etc., ....

Response:
We appreciate your comment. In Model 3, the 95% confidence upper limit for high bonding social capital among women was 0.996 (p=0.049). Furthermore, considering the overall trend, we think that it is reasonable to conclude that our study suggests an inverse association between bonding social capital and self-rated health among women. Although bridging social capital was inversely associated with self-rated health in Model 4 among women, we agree that we need to carefully interpret this due to possible multicollinearity. Therefore, we mainly focus on the results of Model 3 in the abstract and the Discussion section.

6. Discussion:
I don’t quite understand the conclusions based on the results of table 4 mode 3.
For men both bonding/bridging is associated with better health, but why do you conclude that bonding has a beneficial effect for women? There is no effect?

Response:
As remarked above, in Model 3 (Table 4), the 95% confidence upper limit for high bonding social capital among women was 0.996 (p=0.049). Furthermore, considering the overall trend, we think that it is reasonable to conclude that our study suggests an inverse association between bonding social capital and self-rated health among women. We hope that our interpretation is acceptable to you.

It should be acknowledged that it’s difficult and sometimes impossible to compare findings on bonding and bridging social capital since different studies used different measures of the same concept. Overall, this problems does not uniquely relates to bonding and bridging social capital but also to other forms of social capital such as structural and cognitive components for example. Norstrand and Xue (2012) operationalize bonding social capital with a measure of trust and bridging social capital
with a measure of reciprocity, both in a different social contexts (trust in family/friends/neighborhood and reciprocity in organizations).

Response:
We totally agree with you. In accordance with your comment, we decided to address the problem in the Conclusions section. In addition, since this is an important issue, we also added this in the abstract.

(Page 3 line 5)
Considering the lack of consensus on how to measure bonding and bridging social capital, however, we need to carefully assess the generalizability of our findings. Further research is warranted to identify health-relevant dimensions of social capital in different cultural or economic settings.

(Page 16 line 13)
Considering the lack of consensus on how to measure bonding and bridging social capital, however, we need to carefully assess the generalizability of our findings.

7. Conclusion:
I don’t think the study provided convincing evidence to conclude that a different approach for men and women is needed in public health interventions. This is a strong statement. If you estimate a mutually controlled bonding and bridging model (+ other covariates) on the full sample and include two interaction terms (separately): bonding*sex and bridging*sex. What are the results? Do these results support this statement? Could you think of more extensive implications of the findings then the one listed now?

Response:
When we analyzed the data following your advice, we found that the coefficients of the two interaction terms are statistically significant (bonding social capital and sex: p=0.007, bridging social capital and sex: p=0.004). However, we humbly acknowledge that the concluding sentence was a strong statement. Therefore, we decided to remove the statement from both the abstract and the Conclusions section. Accordingly, we thoroughly revised the Conclusions section as follows:

(Page 16 line 6)
This is one of the first studies that has examined the health effects of bonding and bridging social capital separately in the elderly. The present findings suggest that both
bonding and bridging social capital may be relevant to self-rated health of elderly Japanese men. By contrast, the beneficial effects were less pronounced among elderly women, and they may be limited to bonding social capital. Ideally, studies of this kind may help provide health promotion interventions specifically designed for community-dwelling elderly, which may reduce geographical disparities in health within the nation [42, 43]. Considering the lack of consensus on how to measure bonding and bridging social capital, however, we need to carefully assess the generalizability of our findings. Further research is warranted to identify health-relevant dimensions of social capital in different cultural or economic settings, and whether the findings from this study are specific to the elderly of rural area.

**Minor comments**

**Introduction:**

**Third paragraph: some references supporting the statement on community (neighborhood?) social capital and health among elderly are incorrect (e.g. 13 & 14 refer to schools and workplaces in adolescent and adult populations).**

*Response:*  
In accordance with your comment, we deleted citations to these studies.

**Third paragraph: based on the references cited, three of the five studies refer to dental health instead of two**

*Response:*  
Thank you. In accordance with your comment, we revised the sentence as follows:

>(Page 6 line 2)  
Although three of these five studies examined the effects of social capital on dental health [16, 18, 19], these previous studies have implied beneficial effects of social capital on general health among the elderly.

We thank all the reviewers again for their helpful comments, which we feel have improved our manuscript. We hope that with these modifications, our paper can now be accepted for publication.

Sincerely,