Author's response to reviews

Title: Children eat their school lunch too quickly: an exploratory study of the effect on food intake

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Author's response to reviews: see over
Dear Dr Dizon,

Thank you for your letter and the reviews of our manuscript. The reviewers point out some important points that need clarification and I agree with what they say. Reading through these reviews I learnt a lot and I am grateful for the time and effort the Reviewers have spent on their task. I also find it interesting that BMC Public Health uses open peer review; I will easily remember the Reviewers not only because they addressed each of the issues with care, but also because I know who they are!

I have made the following changes in the manuscript:

In order to more easily see how and where I have changed the text I have added line numbers throughout the main text.

First of all, I have added context and aims of the study to the Background part of the Abstract as suggested in your letter. I trust the Abstract is not overly long; I found no text limitation for Abstracts in your instructions to authors.

**Reviewer Cees de Graaf (CdG):**

I am happy that CdG agrees that eating with a high speed at lunch may put school children at risk of eating too much and that this may have implications for public health.

In order to more easily see how and where I have changed the text I have added line numbers throughout the main text.

**General comment:** CdG suggests introduction of a figure with an overview of the different study populations and measurements.

**Response:** In order to facilitate understanding, I have re-written the manuscript so that there is now Study 1 and Study 2. Participants in the two studies, method and results are now separated and I hope that the description is clear.

**Specific comments**

**Abstract**

1. CdG suggests specific information on the number of participants and some numbers on outcome measures.

**Response:** The number of students is given as 100 in Study 1 and 18 girls and 12 boys in Study 2. In the Results section the time spent eating amongst the 100 children in Study 1 and amongst the 18 girls and the 12 boys in Study 2 have been added as well as the percent change in the speed of eating compared to when the children ate individually in the unrestricted condition. I have also added the amount of food eaten when the children ate individually under unrestricted conditions in both girls and boys and stated the percent changes in food intake that occurred when the children ate amongst the other children and, in the final sentence of the Results section, I state that these changes were replicated by experimentally increasing the speed of eating. This is the most important result; as Study 2 is
an experimental study it allows the conclusion that the increase in the speed of eating is the cause of the change in food intake.

I have also added measures of the change in the average the speed of eating in the Abstract.

**Methods**

2. CdG suggests that the first paragraph of the Methods should be clarified as the procedure is unclear.

**Response**: I agree that the procedures should be clearly explained. I have divided the manuscript into Study 1 and Study 2 each with a Heading and a Method and Results section. I hope that the participants are now more clearly described and that each study is easy to understand. CdG also suggests that the number of students used in other studies should not be mentioned in this part of the manuscript and I have therefore removed that information yet mentioned that the number of children studied is similar to that studied in the previous studies to convince readers that our study was properly sized (lines 39-41). CdG also notes that “unrestrained” in Table 2 should be replaced with “unrestricted” and I thank him for pointing out this error, which I have corrected.

The other Reviewer suggested that I should state the hypotheses that were tested and so I have mentioned these hypotheses in the final sentence in the Introduction to each of the two studies, just above the Method section.

3. CdG suggests inclusion of a table on the subjects for each of the two studies.

**Response**: I hope that this issue has been clarified by keeping the two studies separate.

4. CdG asks if the experimental manipulations of eating rate were based on individual curves and how we can be sure that time was manipulated.

**Response**: Issue clarified on lines 89-101 and lines 136-140.

5. CdG asks for a clarification of the instruction to the subjects.

**Response**: The instructions to the subjects are stated on lines 116-125.

**Results**

6. CdG suggests separate sections for Study 1 and 2

**Response**: The studies are now separated.

7. CdG repeats the need to clarify the school lunch conditions.

**Response**: Testing conditions are now more carefully described on lines 119-145.

8. CdG suggests that the legend to Figure 2 should be clarified.
Response: The reason for expressing food intake as percent of intake in the unrestricted condition is given on lines 150-152 and on lines 193-194. I am embarrassed to admit that we did an error with the scale on the y-axis of Figure 2. Thanks for pointing out this mistake. We have corrected the percentages on the y-axis.

I want to thank Dr de Graaf for his careful comments and suggestions. I should add that I have not had the manuscript reviewed by an English speaking scientist. This is because I expect further feedback from the Reviewer and perhaps once I have addressed all their issues and questions the language can be improved; this should be easy as Dr Shield is one of the authors. He has improved an earlier version but a re-review of the language will be useful.

Reviewer Julie Lumeng (JL):

I learnt a lot from this careful review.

In order to more easily see how and where I have changed the text I have added line numbers throughout the main text.

Major Compulsory Revisions:

1. JL suggests that the Introduction should end by stating the hypotheses which will be tested and what gaps in the literature the tests will fill.

2. JL suggests (as does CdG) that the two studies are presented separately.

Response: These are excellent suggestions. I have re-written the manuscript so that there is now Study 1 and Study 2. The relationship between the present study and previous studies and the hypothesis to be tested are mentioned in an introductory paragraph under the heading of each of the two studies. In addition, the aim of each of the comparisons made in Study 2 is given under each of the headings: “Unrestricted meal”, “Time spent eating the school lunch versus eating individually”, and “Food intake in the school lunch and experimental meals”.

3. JL want a detailed description of the procedure for timing the lunch in Study 1. She also suggests that Figure 1 is omitted

Response: This important issue has been clarified on lines 33-41 and on lines 56-62. I wish to include Figure 1; it displays the physical conditions of the study and it is difficult to do this with words only.

4. JL could not get the link to the video to work.

5. JL suggests that the central sentence: “The children ate using Mandometer® following the curve of cumulative food intake that each child had generated in the unrestricted meal” is clarified.

Response: The citation (15) has been changed to the English website, where the video demonstration is available. I hope that the video clarifies how Mandometer® works.
However, to make it clear how the children use the device further explanations are provided on lines 89-101. On lines 120-125 I state that it is rather easy to familiarize participants with the use of Mandometer®.

6. JL suggests that the rating of satiety should be explained.
Response: This is demonstrated on the video (15) and on lines 102-103.

7. JL suggests an improved way to present the statistical analysis.
Response: The statistics of Study 1 are merely descriptive. In Study 2 I have a brief description of the statistics on lines 146-154. A more extensive description is in the Additional file 1. I put this description in an additional file, placing it in the main text would perhaps make the reading heavy. Because the variation in food intake turned out to be the main finding in Study 2, I mention that this is the case and the reason for the choice of statistical analysis on lines 195-198. Non-linear models are gaining popularity because of some advantages, a fact touched upon in the first sentence in the Additional file 1.

8. JL advises that the reason girls and boys were studied should be stated.
Response: The reason why both girls and boys were studied is given on lines 25-26.

9. JL asks us to clarify the results “7 minutes were spent eating”, more precisely.
Response: This important point is detailed on lines 52-63.

10. JL suggests that the scale mechanism which was used to record eating speed is explained.
Response: I hope that the video describing Mandometer®, the model for the cumulative food intake (lines 83-88), the way that the speed of eating is experimentally changed (lines 89-101) answers this important question.

11. JL finds the “5 conditions” of testing difficult to follow and suggests that these conditions are more easily understood if they are coupled to the hypothesis under test.
Response: I have followed this good advice and re-written the procedure for Study 2 on lines 126-145 and the aim of each of these testing conditions is also provided in the Results section in a paragraph under each of the headings.

12. JL finds the sentence “Maintenance of the unrestricted speed of eating had no effect, suggesting that the experimental procedure did not affect food intake non-specifically”, difficult to understand.
Response: It is possible, perhaps even likely, that any experimental method influences whatever it measures in a non-specific manner. That is to say, increasing or decreasing food intake through some artificial mechanism might affect the speed of eating in an undesirable manner, raising a validity problem. For example, food intake was measured with a hidden scale in girls and boys in Study 1, when the children ate together. The results might have been
different if the children had been asked measures how much food they put of their plate and how much was left when they had finished eating by having them put their plate on a scale before and after eating. The finding that the children ate the same amount of food when using Mandometer® with feedback on the computer screen derived from the amount of food and the duration of the meal that the children had shown when eating on Mandometer® without feedback suggests that provision of feedback by the use of Mandometer®, does not non-specifically change eating behaviour. Whilst this is an important point I have complied with the JL’s suggestion by simply deleting the sentence because it is probably not essential. I am happy to modify this opinion should JL suggest that it is necessary.

13. JL suggests we refer to the literature the shows that animals and humans eat more food and faster when eating in groups than when eating alone.

Response: I thank JL for raising this important point. I should have included a reference to the well known fact that people eat more in groups than alone. However, I know of no study in which it has also been found that people in groups also eat faster. I therefore asked Dr John De Castro, who conducted some of these studies and he informed me that whilst people eat more in groups they do not eat faster. I have added reference to the relevant paper by Dr De Castro (lines 238-241 and reference number 21). I have not mentioned work on animals to save space. Thus, I do not think that it has been shown that children eat at a higher speed when eating together. This is the main new finding in the present manuscript.

14. JL suggests that the conclusions should be related to the hypotheses

Response: This is a good idea and I have attempted to comply on lines 273-278.

15. JL suggests that the limitations of the study should be considered.

Response: This is an excellent suggestion and some limitations of the results are discussed on lines 250 (Because the observations were made …) and 253 (If these results can …). A paragraph concerning limitations has been added on lines 279-285.

I want to thank Dr Lumeng for her many useful suggestions and comments. I have not yet had the manuscript reviewed by an English speaking scientist as I anticipate that the Reviewers will have more comments. Once all of these have been addressed satisfactorily I can ask an English (wo)man to go through the text. I hope the new version of the manuscript is better than the previous one and I look forward to hearing Dr Lumeng’s comments.