Author's response to reviews

Title: Continuous admission to primary school and mental health problems

Authors:

Sijmen A Reijneveld (s.a.reijneveld@med.umcg.nl)
Carin H Wiefferink (ch.wiefferink@pg.tno.nl)
Emily Brugman (e_brugman@yahoo.com)
Frank C Verhulst (f.verhulst@erasmusmc.nl)
S Pauline Verloove-Vanhorick (sp.verloove@pg.tno.nl)
Theo GW Paulussen (tgwm.paulussen@pg.tno.nl)

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Author’s response to reviews:

In the following text, we first provide the comments as given by the reviewer, and next our responses, preceded by [RESPONSE].

Reviewer 1: Matti Sillanpaa

In general view, a low calendar (and subsequent developmental) age at school entrance may expose children to learning, behavioral and psychosocial problems. So far, few data exist on the effect of a low age on peer relations, bullying, ability to learn etc. This paper makes an attempt to find an answer to the question.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached):

1. The study populations are of utmost importance to the results. Therefore, they should be described in more detail and the figures checked/corrected. The authors give ref #6 and #7 about "a cross-sectional national study on children aged 5-15" but, according to the original ref #6, the age range was 4-16, and ref. #7 ("Identification by child health...") cannot be found. The body text of ref. #8 does not give the number of subjects, but in the abstract, it reads that they were 6375. This is not equal to 7737 given in the manuscript. [RESPONSE] In total, 6 children were 4 years old, and 5 were 16 years old (i.e. both 0.1%). For that reason, we denote our sample as 5-15 years, but we were unable to convince the editors of Social Psychiatry and Psychiatric Epidemiology regarding this (ref #6). We have clarified the age range concerned in the footnote of Table 1.

We corrected the first part of the title of ref #7, and checked all references. The total number of respondents in ref #8 is presented in Figure 2 of that paper (Participant flow and follow-up). This total number is 7852; out of these, 1477 were excluded from the analysis in that trial because they did not meet the required inclusion criteria for that trial (i.e. being of Dutch origin and not being under treatment for psychosocial problems). They have been included in the current analysis, though, except for 15 children with incomplete data on month of birth. A short remark on this has been added to the Methods section (paragraph on Participants).

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. The total score of the Child Behavior Checklist (CBCL) was applied. It was translated into Dutch, but was the Dutch translation back-translated into English? [RESPONSE] We used the validated Dutch version of the CBCL that has been translated into Dutch and back-translated into English by the research group of professor Verhulst (one of the authors of this paper). We have added a short remark on this to the Methods section (page 6).

2. It would be interesting to know about the subscales, such as internal and external behavioral and social competence. Were they analyzed? [RESPONSE] We did not analyze subscales because we expected our study to have the most powerful outcome to be the CBCL Total Problems scale.

Discretionary Revisions (which the author can choose to ignore)

1. Ref. Goodman et al. should be moved to the discussion section.
We moved this reference to the first sentence of the discussion (and deleted the remainder of the sentence concerned).

Reviewer 2: Gus Thompson

Reviewer's report:

General
The fact that age of entry for the first two grades ("continuous") differs from entry into the third grade and beyond (at "one moment"), sets up an interesting natural experiment. However, in addition to timing of entry effects, there are a number of confounds inherent to any comparison of the two groupings (age, number of months in the first two years, and other factors which might produce different experiences in the higher grades). Plus, the RCT data exist for the younger group only. Differences might well be due to the absence of such data in the older group. These issues might not be completely addressable, but they should be noted and placed in context and identified as limitations, if appropriate. Further, there are some methodological problems/questions which might be addressable in a satisfactory manner -if not, the paper is not publishable in my opinion.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
1. The 2nd purpose of the study was to determine whether any relative age effect persisted after the age of six years. The confounds noted above need to be addressed before conclusions are drawn.

   [RESPONSE] We agree that the number of months that a child is in the first two grades differs per child. This is inherent to a system of continuous admission, followed by admission to subsequent grades once a year. Some children will thus have a more lasting school experience than others on entering the third grade. We have clarified this in the Introduction (page 4), and have added a comment on this to the discussion (page 8).

   Moreover, the RCT data only concerned the 5/6 year old group. These data were obtained in much the similar way as the other data. In both studies we obtained participants by means of a two-step procedure. First, Child Health Services were asked to participate. And second, the participating CHS were asked to provide data on a specified number of children. In the cross-sectional sample this concerned a team of child health professionals who were asked to provide data on a sample of 75 children for each age group. In the RCT each participating child health professional was asked to provide data on 50 children for each measurement period, 150 in total. Similar questions were asked to parents and to child health professionals in both studies. We have added information on the sampling and data collection to the Methods section (page 5), and we have added a comment on the comparability of the two samples to the Discussion section (page 9).

   Finally, we agree that other factors in the higher grades that we did not measure may have influenced our findings, including selective retention and acceleration of children. We have added a comment on this to the Discussion section (page 9).

2. The data from the RCT should not ordinarily be included in the comparison of the 5 & 6 year-olds with those seven and older (i.e. there are no comparable older children in the RCT study!). To include both implies that the two studies had no overlapping children, and were essentially of equivalent methodology. Data from the two studies should at least be presented separately with a good case being made to justify the assumption of the equivalency of the two approaches.

   [RESPONSE] We have added information on the very similar methodology of the two studies to the Methods and the Discussion sections (compare at 1.). The two studies did not have overlapping children, the cross-sectional study being done in 1997/1998 with the youngest participants being 4 years old and the RCT being done in 2001 on children aged 5 and 6. We have added information on the years in which the studies have been performed to the Methods section (page 5).

   We have further added data on the 5/6 year olds split by data source (cross-sectional and RCT, respectively), to table 2.

3. Some explanation is needed for the way in which children are assigned to age-groupings. Since entry is continuous for the first two grades, it does not appear that the birth-month assignments noted in the Analysis section can be taken to represent relative age (which is age in relation to one's classmates) even a point in time. Further, a child's position at any point is different than at any other month because of the continuous addition of new, younger, students. To complicate matters, the older ones do not leave the sample continuously, but at one time per year. What does this mean for relative age? For the older children (ages seven and up), month of birth is not the best measure, since it does not accurately convey a child's age relative to his or her classmates. Is it relative to the age of starting grade three? Does it take into account the very long length of time that some will spend in the first two grades? Are some children held
back or accelerated? In either case, the relative age measure has to be defined clearly and operationally.

[RESPONSE] The effect of continuous admission in the first two grades is that some children stay 11 months longer in these grades than others. The latter will thus never be the oldest ones in a class during grades 1 and 2, whereas the former will be, even though they all enter this grade at the same age of 4 years. The cut-offs for relative age in this study have been taken in such a way that they categorize this effect of being the oldest at least once, i.e. they are dependent on the cut-off for transition to grade 3. We have added information on this to the Introduction (page 4), and included this in the discussion (page 8), also regarding the way in which our categorization of relative age works out in grade 3. Retention and acceleration are allowed in the Dutch system, and probably mostly occur at the transition from grade 1/2 to grade 3, but no data are available on the proportion that this concerns. We have added a comment on this to the Discussion section; it may offer an explanation for the decreasing relative age effects in grades 3 and higher (page 9).

4. The Discussion section could be strengthened. The entirety of the first paragraph contains results, and should be thus moved to that section. Very little is said about the implications for relative age theory nor for application.

[RESPONSE] We have added some comments on the explanation of our findings, compare at previous points. Moreover, we have extended the discussion regarding the implications of our findings, especially regarding the effect of selective retention and acceleration at the transition to grade 3 which may be facilitated by continuous admission to grade 1. The first paragraph of the discussion was intended to provide a very short summary and interpretation of our findings compared with those in the literature. We have clarified this and have moved the reference to the study of Goodman from the Results section to that paragraph (compare our response to the comments of the first reviewer).

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Page 10, Reference 3. An "n" should probably be added to the word "withi"

[RESPONSE] OK, done. Apparently, we missed some errors in the references (compare reviewer 1). We checked them all again.

2. Table 2. It looks as if the bottom line should be preceded by three asterisks.

[RESPONSE] OK, done.

Discretionary Revisions (which the author can choose to ignore)

1. Page 3, Introduction, Paragraph 1 - last 2 lines. That particular application of relative age theory did not refer to athletic performance, just to academic performance.

[RESPONSE] This final sentence of the first paragraph of the introduction intended to provide an explanation for the adverse health outcomes among the youngest in a class in general, and not only for the findings of Thompson 1999 that have been cited in the preceding sentence. We have modified this sentence to clarify its intended meaning.

2. Under measurements (page 5), the implication is that the child health professional made a dichotomous rating on the presence or absence of a psychosocial problem. However, in the Analysis section, the implication is that the CHPs rated problems as moderate or severe. Clarification would help the reader.

[RESPONSE] We have added a clarification in the Methods section, at Measurements.

3. It might be more informative to use a trend analysis over the three age levels. Mantels test for a progressive increase could be used for the categorical data (clinical ratings).

[RESPONSE] We added information on Mantel’s test for linearity to Table 2.

4. In two places on page 6, findings were explained briefly, but the data were "not shown". Withholding means, etc. is fine, but it is traditional (and helpful to the reader) to include, within parentheses, the results of the statistical test used. e.g (t = 2.66, df=1, p<.01 or F = 1.11, df = 2/1200, N.S.)

[RESPONSE] In both cases, it concerns a series of comparisons (and thus of p-values). In the first case, we already provided a series of p-values for the crude analysis. In the second case, we did not and therefore have added a range of the p-values concerned and indicated the type of statistical test that we used (page 7).

Reviewer 3: Benjamin Vicente

It appears to be an interesting analysis of two Dutch national data sets, the results add valuable information to a well defined and presented problem.
Despite the data was not collected by the authors it seems sound and the analysis adequate. 
[RESPONSE] The latter remark is not correct. All authors of this paper were involved in the collection of at least one of the datasets concerned, and the first author coordinated the research part of both. A remark on this has been added to the Author's contribution section.

The standard of the manuscript is acceptable, data well presented and adequately support conclusions.

Title and abstract appear accurate.
The quality of written English is acceptable only minor improvements could be made. As an example, in the abstract, method section and Method (page 5 line 2) when referring to the proportion of children participating in the original study, it would read better "response rate:" instead of just "response:"
[RESPONSE] This has been corrected. The first version had already been sent to an English corrector, the same applies to this revision.