First-grade retention: Effects on children’s actual and perceived performance throughout elementary education

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1. Introduction

• Starting point
  – Many young children struggle in elementary school
  – Countries deal with these early problems in a different way
  – Internationally frequently applied measure = grade retention
1. Introduction

- Past research on effects of grade retention on children’s performance
  - e.g., Hong and colleagues, Wu and colleagues
  - Results: mixed but generally negative effects
  - Limitations
    - Children’s performance as perceived by their teacher?
    - Mostly US studies…
1. Introduction

- Grade retention in Flanders
  - Relatively high rate
    - For example: PISA 2009
1. Introduction

• Grade retention in Flanders (continued)

– Relatively high rate ... especially in Grade 1
  ▪ About 7% of Flemish children repeat Grade 1

– Socially approved by educators, policy makers and parents

  → being a grade retainee in Flanders has a less negative connotation than for example in the US

– No formal rules regarding grade promotion (no national/state standardized test procedures)

  → retention decision = joint decision by teacher and parents
1. Introduction

• Research question
  – Is Grade 1 retention an effective practice or not?

• Focus of this study
  – children’s growth in performance throughout elementary school
    ▪ actual performance on math and reading fluency achievement tests
    ▪ perceived performance in math and language by the teacher
2. Method

- Subjects: representative sample from the Flemish SiBO-project
  - 3624 first-graders, of which 298 were retained
  - 222 classes
  - 121 schools

followed until Grade 6
2. Method

• Instruments

– Actual math skills: Math achievement tests
  ▪ administered yearly (Grade 1 to 6)
  ▪ especially constructed for use in the SiBO-project
  ▪ items on diverse domains in math
  ▪ IRT-based scale scores were used

– Actual reading fluency skills: Three-Minutes-Test
  ▪ administered yearly (Grade 1 to 3)
  ▪ adapted Dutch achievement test (Cito)
  ▪ 3 reading cards with words of increasing word difficulty
2. Method

• **Instruments** (continued)

  – Perceived math and language skills: Teacher questionnaire
    - rated yearly by the teacher
    - items on a 1 to 5 point Likert scale
2. Method

• **Instruments** (continued)

  – Propensity of repeating Grade 1

    ▪ official records
    ▪ achievement tests
    ▪ Standard Progressive Matrices
    ▪ teacher questionnaire about the child
    ▪ parent questionnaire
    ▪ teacher questionnaire about teacher didactics
    ▪ school staff questionnaire

• 68 prior student characteristics
• 59 prior class characteristics
• 42 prior school characteristics
2. Method

• Analyses: 6-steps-procedure
  – **STEP 1** identification of ‘true’ confounders of Grade 1 retention
    ▪ prior student, class, and school characteristics
    ▪ that are related to both treatment (i.e., Grade 1 retention) and outcome (i.e., growth in performance)
    → 55 prior student characteristics and 3 prior class characteristics
  – **STEP 2** estimation of each child’s propensity score (PS) based on these confounders
    ▪ 3-level logistic regression analysis (students – classes – schools)
2. Method

Frequency

Promoted (n=3,326)

Retained (n=298)

PS logit
2. Method

- Analyses: 6-steps-procedure (continued)
  - **STEP 3** selection of students for final growth curve analyses based on 2 criteria
    - ‘regular’ school trajectory
      - G1-G2-G3-G4-G5-G6
      - G1-G1repeat-G2-G3-G4-G5-G6
    - no changing of school throughout elementary school
2. Method

- Analyses: 6-steps-procedure (continued)
  - **STEP 4** PS decile stratification

  ![Diagram showing cut-offs for strata based on overlap and division into 10 strata of equal size.](image)

  - Cut-offs for strata based on overlap
  - Division into 10 strata of equal size
2. Method

• Analyses: 6-steps-procedure (continued)

  – **STEP 5** testing of accuracy of PS stratification

  within-stratum balance in

  ▪ PS
  ▪ at least 95% of the observed prior student, class, and school characteristics

  → Retained and promoted children within a certain stratum are equivalent (within sampling fluctuations) in terms of risk factors preceding Grade 1 retention
2. Method

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Promoted</th>
<th>Retained</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>N</td>
</tr>
<tr>
<td>1</td>
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<td>-6.27</td>
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</tr>
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<td>243</td>
<td>-5.71</td>
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<td>-1.25</td>
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</tr>
<tr>
<td>Total</td>
<td>2,305</td>
<td>-4.47</td>
<td>120</td>
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</tbody>
</table>
2. Method

• Analyses: 6-steps-procedure (continued)
  
  – **STEP 6** estimation of average effects of G1 retention on children’s growth in performance
    
    ▪ 3-level (curvi)linear growth curve analyses (measurements – students – schools)
2. Method

• Analyses: 2 comparison strategies
  – Same-grade approach = comparing retainees with their younger grade-mates (their former classmates a school year earlier)
  – Same-age approach = comparing retainees with their age-mates who were promoted to a higher grade (their former classmates)
2. Method

Research year 1 (age 7)  Research year 2 (age 8)  Research year 3 (age 9)

3rd grade

2nd grade

1st grade

A  B  C  D  E  F  G  H

Cohort 1

Cohort 2 (not in SiBO dataset)
2. Method

SAME-GRADE COMPARISON
2. Method

SAME-AGE COMPARISON
2. Method

• Analyses: 2 comparison strategies (continued)

  – Why? ~ 2 different questions

    ▪ How do Grade 1 repeaters, at the cost of one extra year of education, develop in comparison to grade-mates?
      SAME-GRADE APPROACH

    ▪ How would Grade 1 retainees have developed, had they been promoted to Grade 2 instead?
      SAME-AGE APPROACH

  – Why? each approach has its own restraints
3. Results

• Same-grade comparisons

– During the retention year (short run)
  
  ▪ Grade 1 retainees start with an (actual) advantage in math and reading fluency compared to their grade-mates who are at similar risk of being retained but always get promoted
  
  ▪ … though their teachers rate them as equally (bad) skilled in math and language

– BUT … through the elementary years (long run)

  ▪ they grow significantly slower → they end up with a relative disadvantage at the end of elementary school, in both actual performance and performance as perceived by the teacher
3. Results

Retained Grade-mate
3. Results

![Graph showing predicted reading fluency scores for retained and grade-mate students across grades 1 to 3. The orange line represents retained students, and the blue line represents grade-mate students. The scores increase as the grade advances.]
3. Results

![Graph showing predicted teacher rating of math skills against grade. The graph compares retained students (orange line) and grade-mates (blue line). The x-axis represents grade (1 to 6), and the y-axis represents the predicted teacher rating of math skills (5 to 1). The graph illustrates a downward trend in predicted teacher rating as grade increases.]
3. Results

![Graph showing predicted teacher rating of language skills over grades for Retained and Grade-mate students.](image)
3. Results

• Same-age comparisons

– Overall, during the retention year (short run) AND through the elementary years (long run)

  ▪ Grade 1 repeaters would have performed better in math and reading fluency and would have been rated more positively by their teacher in terms of math and language skills, had they been promoted to second grade instead of been held back
3. Results

![Graph showing predicted math score versus age for retained and age-mate groups. The graph displays two lines: one for retained and one for age-mate, with the predicted math score on the y-axis and age on the x-axis.]
3. Results

![Graph showing predicted reading fluency scores for Retained and Age-mate groups across different ages.](image-url)
3. Results

<table>
<thead>
<tr>
<th>Age</th>
<th>Predicted teacher rating of math skills</th>
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<tbody>
<tr>
<td>7</td>
<td>Retained</td>
</tr>
<tr>
<td>8</td>
<td>Age-mate</td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

- **Retained**
- **Age-mate**
3. Results

In the graph, the predicted teacher rating of language skills is shown for both retained and age-mate students. The retainees (orange line) consistently score higher than the age-mate students (blue line) across the ages 7 to 11 years.
4. Conclusions and discussion

• Actual performance
  – Grade 1 retainees do not seem to benefit much from their retention year

• Teacher-perceived performance
  – It seems that teachers (perhaps unconsciously) have severe negative perceptions with regard to repeaters
  – Indication of a Pygmalion effect?

G1 retention → teacher perceptions → actual performance of repeater
4. Conclusions and discussion

• Future research is needed
  – Representativeness of the final sample?
    ▪ promoted students = selective group
  – Other outcomes?
    ▪ school trajectory
    ▪ psychosocial functioning
    ▪ academic self-concept
4. Conclusions and discussion

• Future research is needed (continued)
  – Sensitivity analyses?
  – Moderating effects?
    ▪ child characteristics
    ▪ provision of additional support at or outside school
  – Mediating effects?
Thank you for your attention!

Any suggestions or comments are welcome:

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