Is a Decline in Reading Achievement Due to a Low Level of SES? Is It (Im)Possible?

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Introduction and the aims of the study

The Progress in International Reading Literacy Study (PIRLS) is an international assessment and research project designed to measure reading achievement at the fourth-grade level, as well as school and teacher practices related to instruction. Fourth-grade students complete a reading assessment and questionnaire that addresses students' attitudes toward reading and their reading habits. In addition, questionnaires are given to students' teachers and school principals to gather information about students' school experiences in developing reading literacy. Since 2001, PIRLS has been administered every 5 years (2001, 2006, 2011, 2016, 2021) [1; 2].

The number of participants (countries and benchmarking participants) is increasing every cycle (Fig. 1).
Only 12 countries from the EU participated in every cycle: Bulgaria, England, Germany, France, Hungary, Italy, Lithuania, Netherlands, Norway, Slovakia, Slovenia and Sweden.
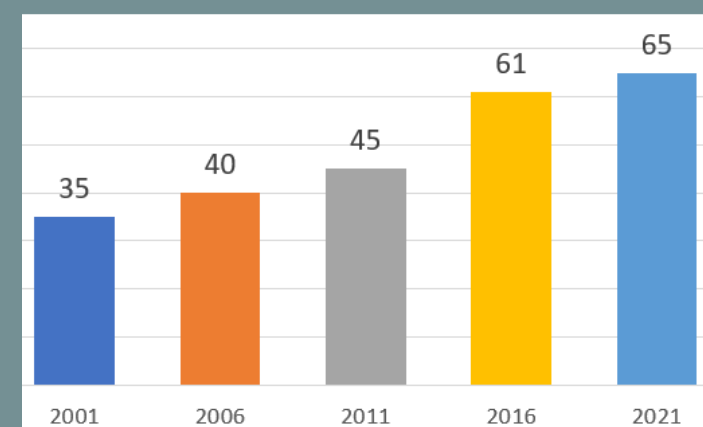

Fig. 1. The number of countries and benchmarking participants

Researchers seek to explain the reading achievements of students in PIRLS by various factors, including socioeconomic status (SES). The construction of the SES index for PIRLS is based on the approach used in PISA (Programme for International Student Assessment) [3; 4].

The construction of a socio-economic status (SES) index for PIRLS is based on the approach used in PISA (Programme for International Student Assessment). Students are scored according to their parents' reports regarding the four indicators on the Home Socioeconomic Status scale (Fig. 2) [5].

Number of books in the home:
1) 0–10
2) 11–25
3) 26–100
4) 101–200
5) More than 200

Number of children's books in the home:
1) 0–10
2) 11–25
3) 26–50
4) 51–100
5) More than 100

Highest level of education of either parent:
1) Finished some primary or lower secondary or did not go to school
2) Finished lower secondary
3) Finished upper secondary
4) Finished post-secondary education
5) Finished university or higher

Highest level of occupation of either parent:
1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator)
2) Clerical (clerk or service or sales worker)
3) Small business owner
4) Professional (corporate manager or senior official, professional, or technician or associate professional)

Fig. 2. Four indicators on the Home Socioeconomic Status scale

Cut scores divide the scale into three categories (levels):
- Students with **Higher socioeconomic status** had a score at or above the cut score corresponding to their parents reporting they had more than 25 books and more than 25 children's books in their home, that at least one parent finished university, and that at least one parent had a professional occupation, on average.
- Students with **Lower socioeconomic status** had a score at or below the cut score corresponding to their parents reporting they had 25 or fewer books and 25 or fewer children's books in the home, that neither parent had gone beyond upper secondary education, and that neither parent was a small business owner or worked in a clerical or professional occupation, on average.
- All other students had **Middle socioeconomic status**.

The study aims to determine whether lower reading achievement can be explained by a low level of SES. The data set consisted of 12 countries from the EU that participated in all five cycles of PIRLS (covering the period 2001-2021).

Conclusion

The results showed that the mean reading by SES levels was lower for the low-SES group. For example, in Lithuania, the average reading score for the low-SES group of students ranged from 503 (international avg. 443) in 2001 to 430 (international avg. 456) in 2021. This indicates a decrease in the reading skills of the low-SES group of students. Meanwhile, the average reading achievement of the high-SES group of students increased from 588 (international avg. 548) in 2001 to 604 (international avg. 542) in 2021.

However, the results show that most of the data came from the medium SES group. The proportion of students in the medium SES group ranges from 23.9% to 86.2% in the analyzed countries. Meanwhile, the proportion of low-SES groups of students varies from 0.05% to 17.2%.

Also, after analysing the data collected from the parents, it turned out that in some countries a large share of the data was omitted in each cycle. The question then arises: can we interpret the data correctly if we don't have enough data for all three levels of SES?

The analysis of the PIRLS data on reading achievement by SES levels revealed that conclusions should be drawn very cautiously.

Results

For the analysis, 5 plausible values of reading achievement were used. There were no missing values for reading achievement, but this was not the case for SES. All statistical analyses were performed with each plausible value separately and averaged afterwards.
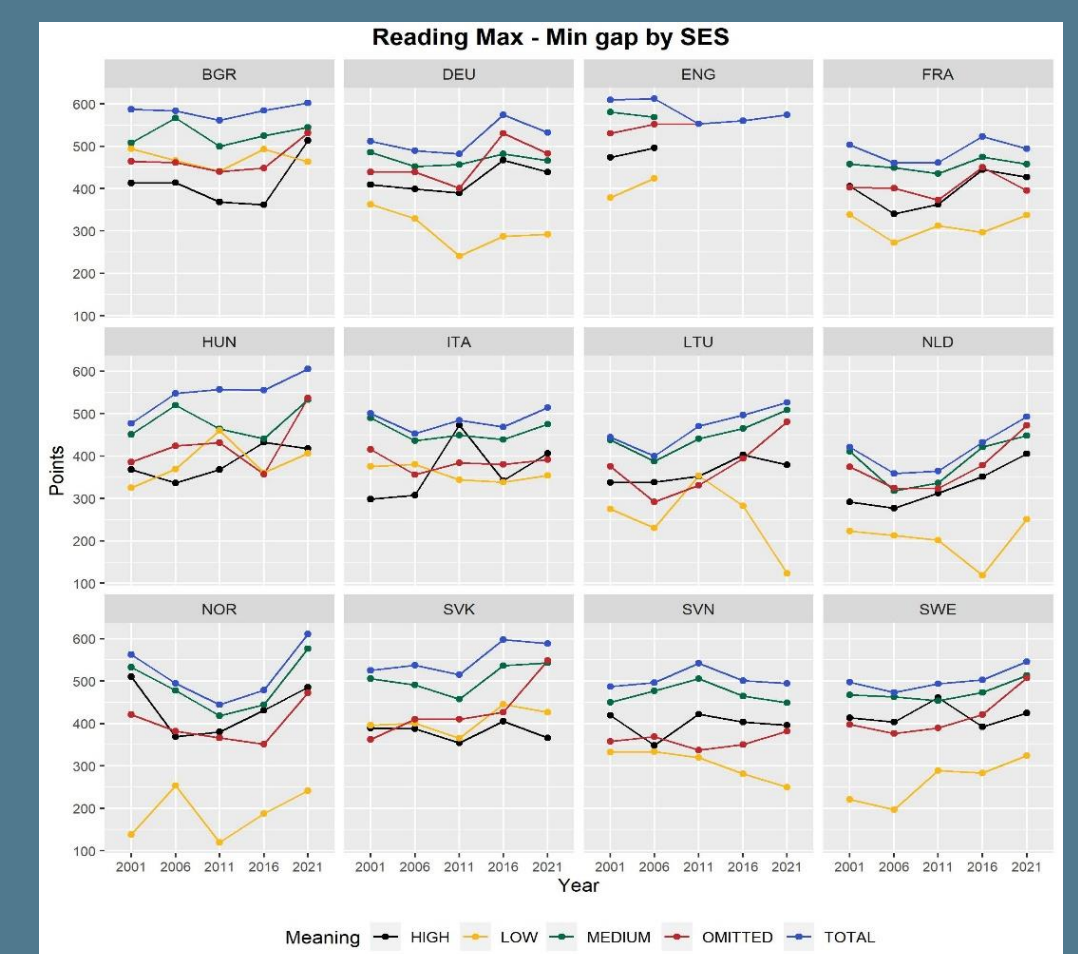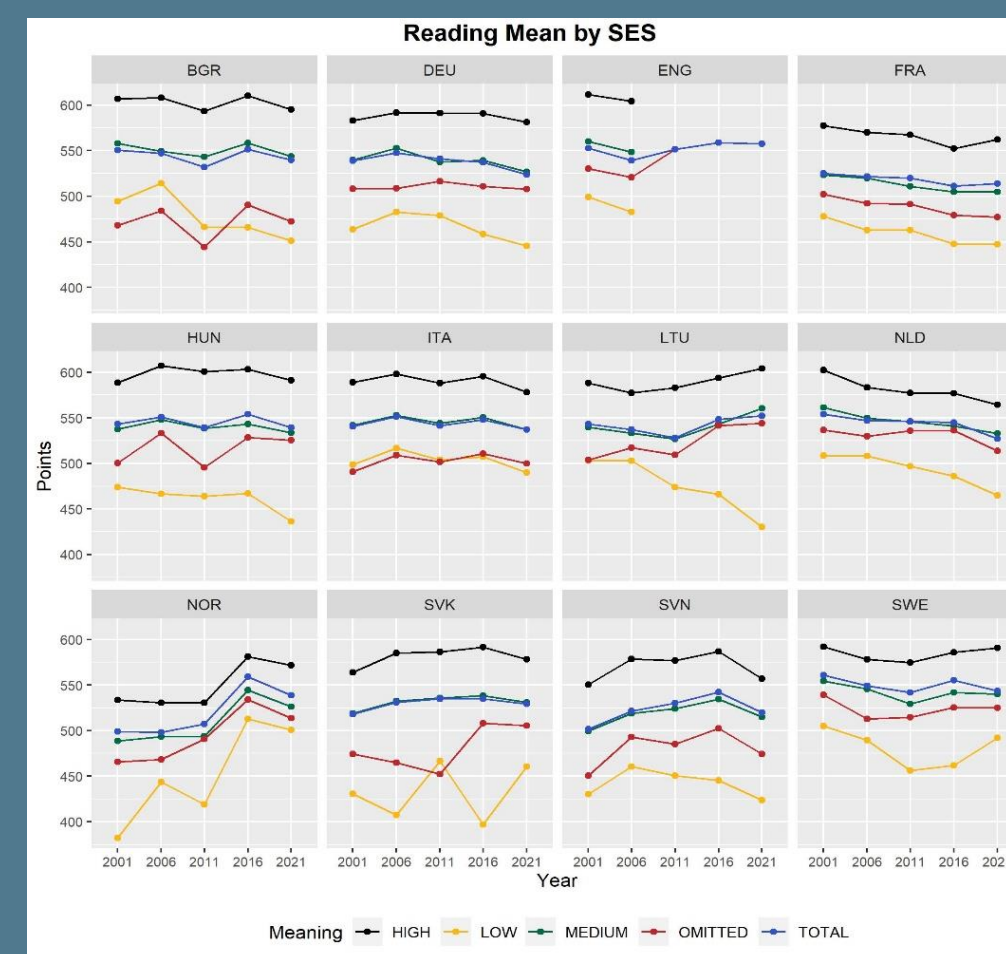

Fig. 3. Results of students' reading mean by SES levels   Fig. 4. Results of students' reading max-min gap by SES levels

In some countries, a large share of the data from parents was omitted in each cycle. For example, omitted SES entries in England vary from 45% to 100% in each cycle, in Germany from 15.6% to 44.4%, in the Netherlands from 33.2% to 53%, and in Sweden from 7.8% to 43.9%. Only in Bulgaria did the percentage of low SES students exceed 10% at each level.
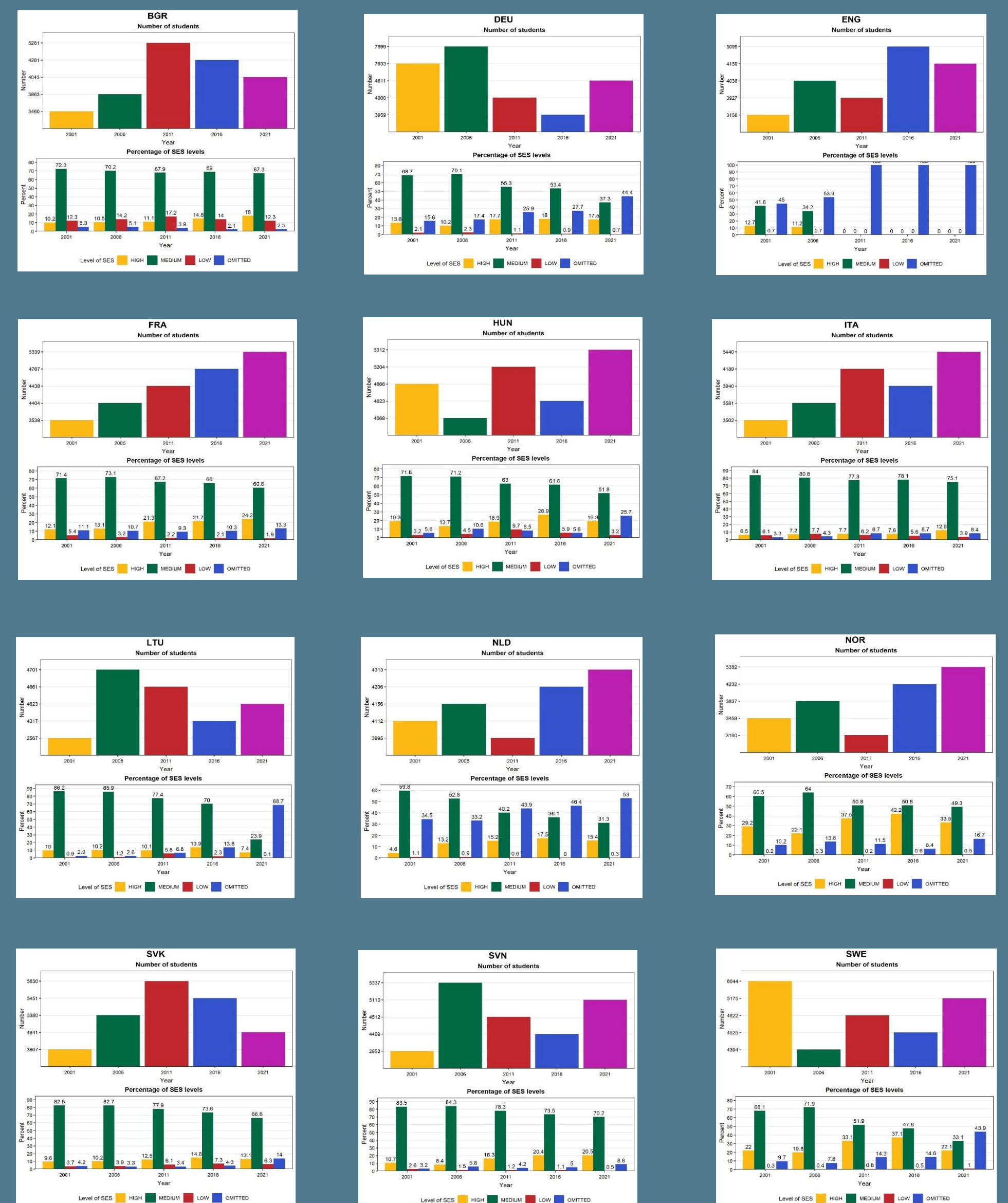

Fig. 5. Number of participants in each 12 countries and percentages of SES levels

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