

# The impact of socio-economic status on educational achievement in South Africa

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# Overview

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- Conceptual framework: Education & SES
- Progress in International Reading Literacy Study (PIRLS 2006)
  - South Africa's performance
- Socio-economic gradients
- Implications for social mobility

# Conceptual framework:

## Education & SES

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- SES:
  - “The relative position of a family or individual on an hierarchical social structure, based on access to, or control over, wealth, prestige and power.”  
(Mueller & Parcel, 1981)
- South Africa: race and class entangled

# Conceptual framework:

## Education & SES

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- Historically, education has defined class
- Coleman Report (1966)
  - Funding not a very good predictor of educational achievement
  - Family background, SES, peer-effects NB
- Family SES is a major determinant of both education *attainment* (Filmer & Pritchett, 1999) and *quality* in terms of performance (Barro & Lee, 1997).

# Conceptual framework:

## Education & SES

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- Channels through which SES influences educational outcomes:
  - Home support; early childhood development (Lee & Burkham, 2002)
  - Within-school peer effects
  - Resource shortages

# PIRLS 2006

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- 2<sup>nd</sup> wave of PIRLS conducted by International Association for the Evaluation of Educational Achievement (IEA)
- 40 countries
- 2 African countries: SA & Morocco
- Testing done at 4<sup>th</sup> grade
  - But, in SA testing was done on 5<sup>th</sup> grade students

# PIRLS 2006

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## ■ 6 Questionnaires:

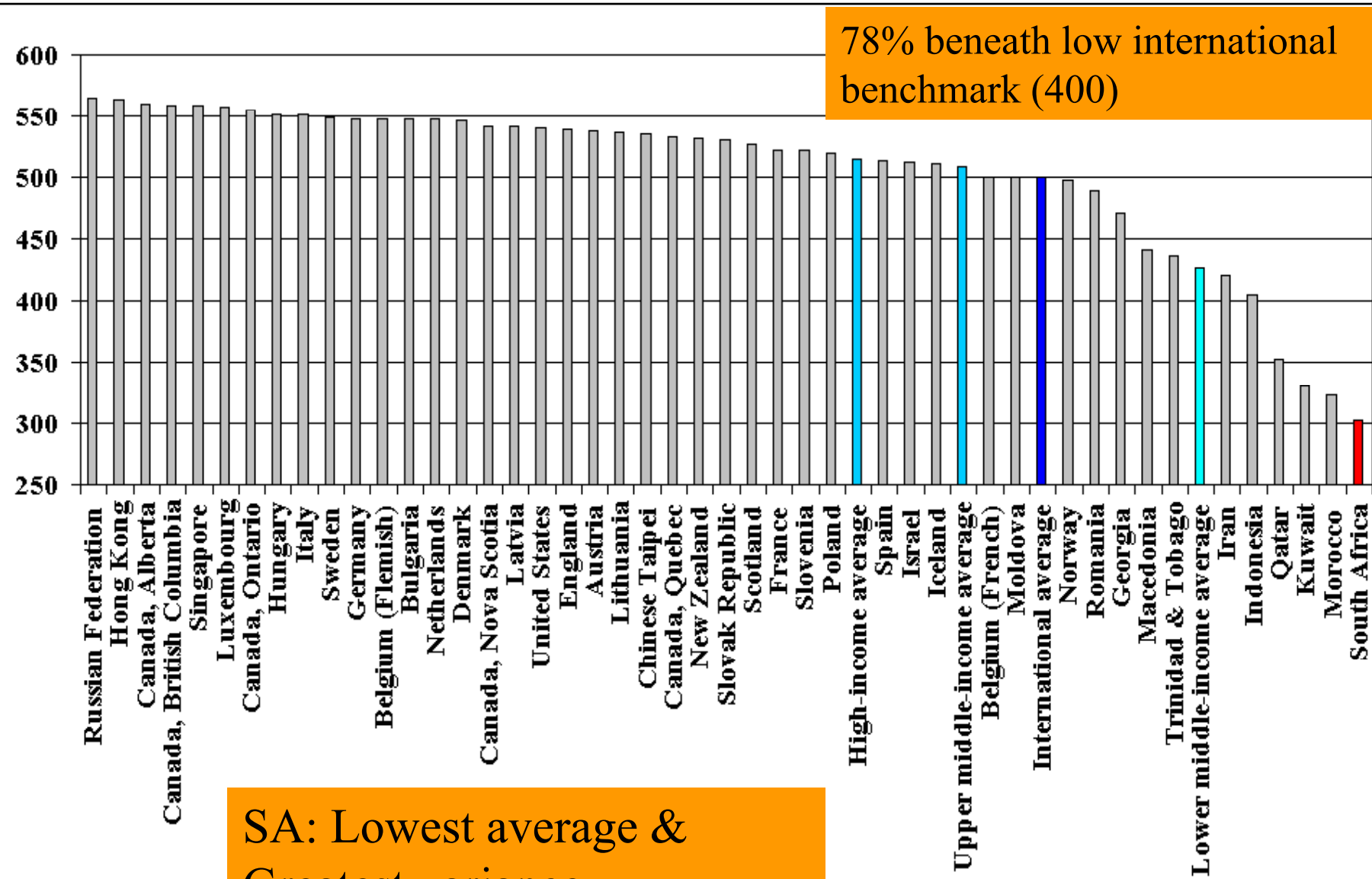
- Student, home, teacher, school, curriculum, reading test booklet.

## ■ Reading scores set to have a scale average of 500 and a standard deviation of 100.

- Low International Benchmark: 400
- Intermediate International Benchmark: 475
- High International Benchmark: 550
- Advanced International Benchmark: 625

- Top performing country: Russia – 565
- Lowest performing country: South Africa - 302

# Figure 1: Mean overall reading achievement score



# Measuring SES in PIRLS

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- An index for SES was constructed from ten questions regarding household possessions.
- The weighting of each “possession” variable in the index was done using Principal Components Analysis.
  - **Computer**
  - **Study desk/table**
  - **Own books (Excl. textbooks)**
  - **Newspaper**
  - **Own room**
  - **Own cellular phone**
  - **Calculator**
  - **Dictionary**
  - **Electricity**
  - **Tap water**

# Socio-economic gradients

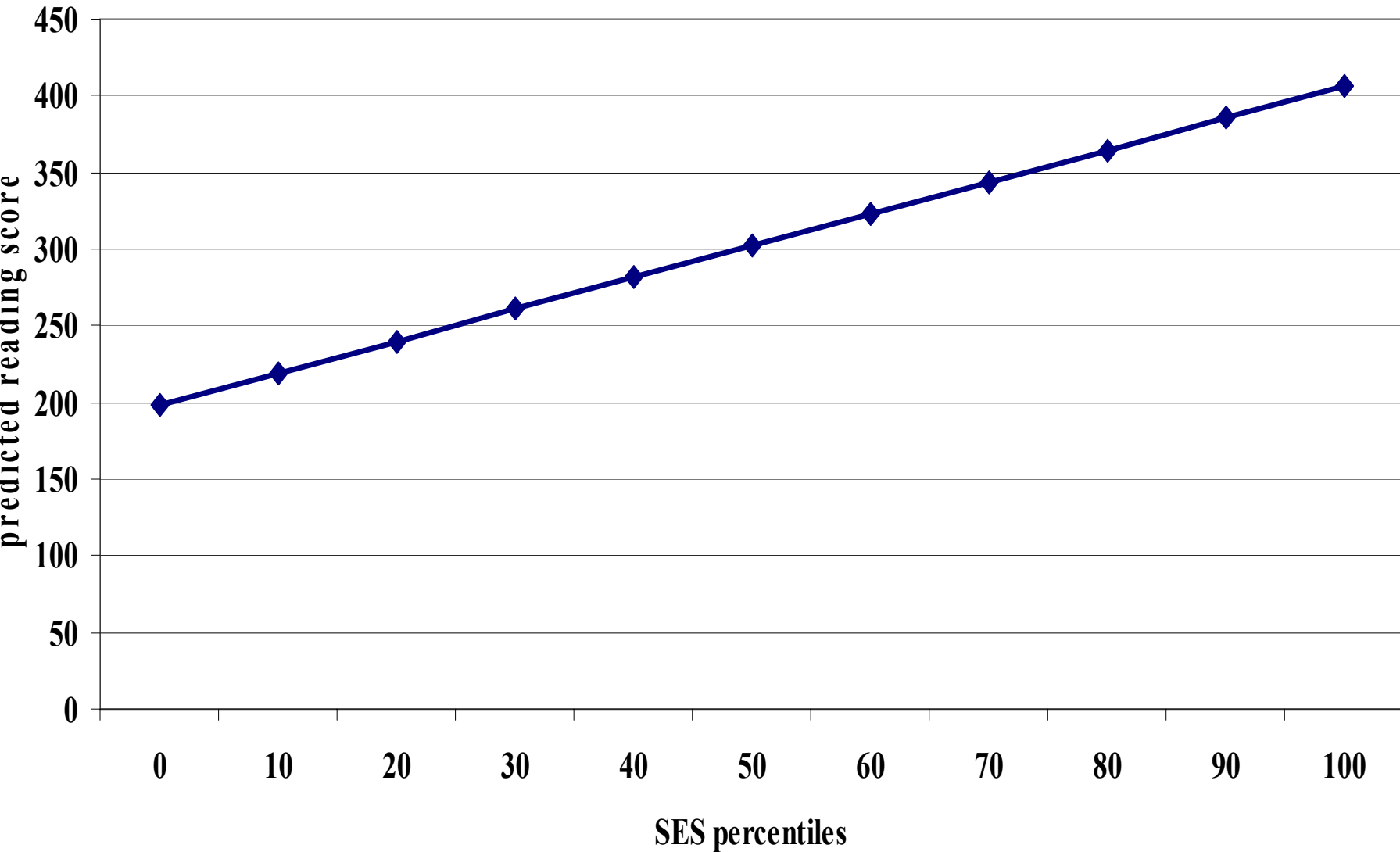
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- SES gradient: Graphical representation of the linear regression relationship between SES and an outcome of interest, in this case educational achievement (reading score).

$$\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 SES_i$$

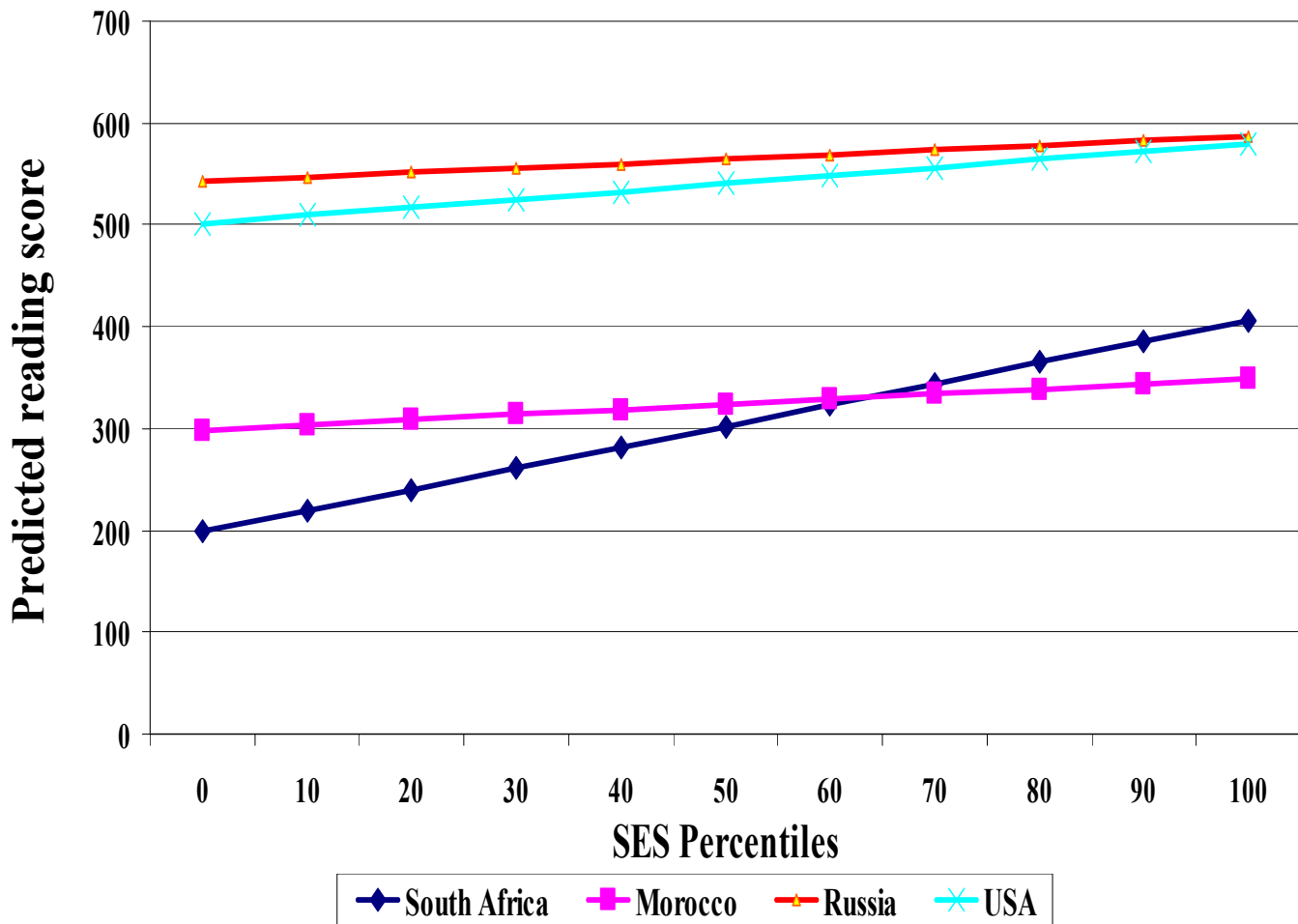
$$\hat{Y}_i = 198.49 + 2.08 * SES\_percentile$$

**Figure 2: Basic SES gradient for South Africa**



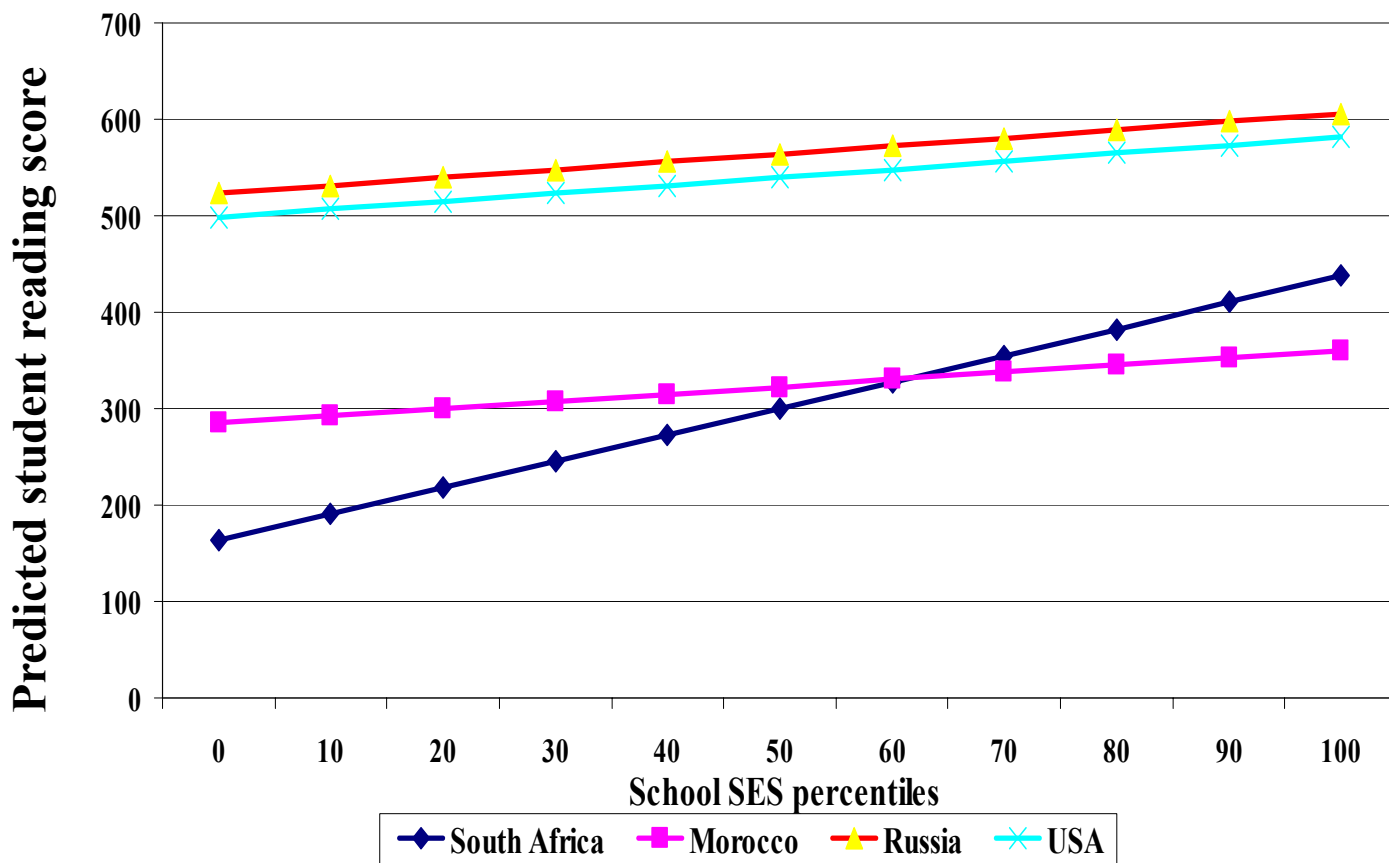
$$\hat{Y}_i = 198.49 + 2.08 * SES \text{ percentile}$$

# Figure 3: International Comparison of SES gradients



	SA	Morocco	Russia	USA
Intercept	198.49	298.46	542.08	501.27
Coefficient on SES	2.08	0.51	0.45	0.79
R-squared	0.23	0.03	0.04	0.09

# Figure 4: School-level SES gradients in international comparison



	SA	Morocco	Russia	USA
Coefficient on school SES percentile	<b>2.73</b> (2.08)	<b>0.75</b> (0.51)	<b>0.82</b> (0.45)	<b>0.83</b> (0.79)
R-squared	<b>0.38</b> (0.23)	<b>0.05</b> (0.03)	<b>0.13</b> (0.04)	<b>0.12</b> (0.9)

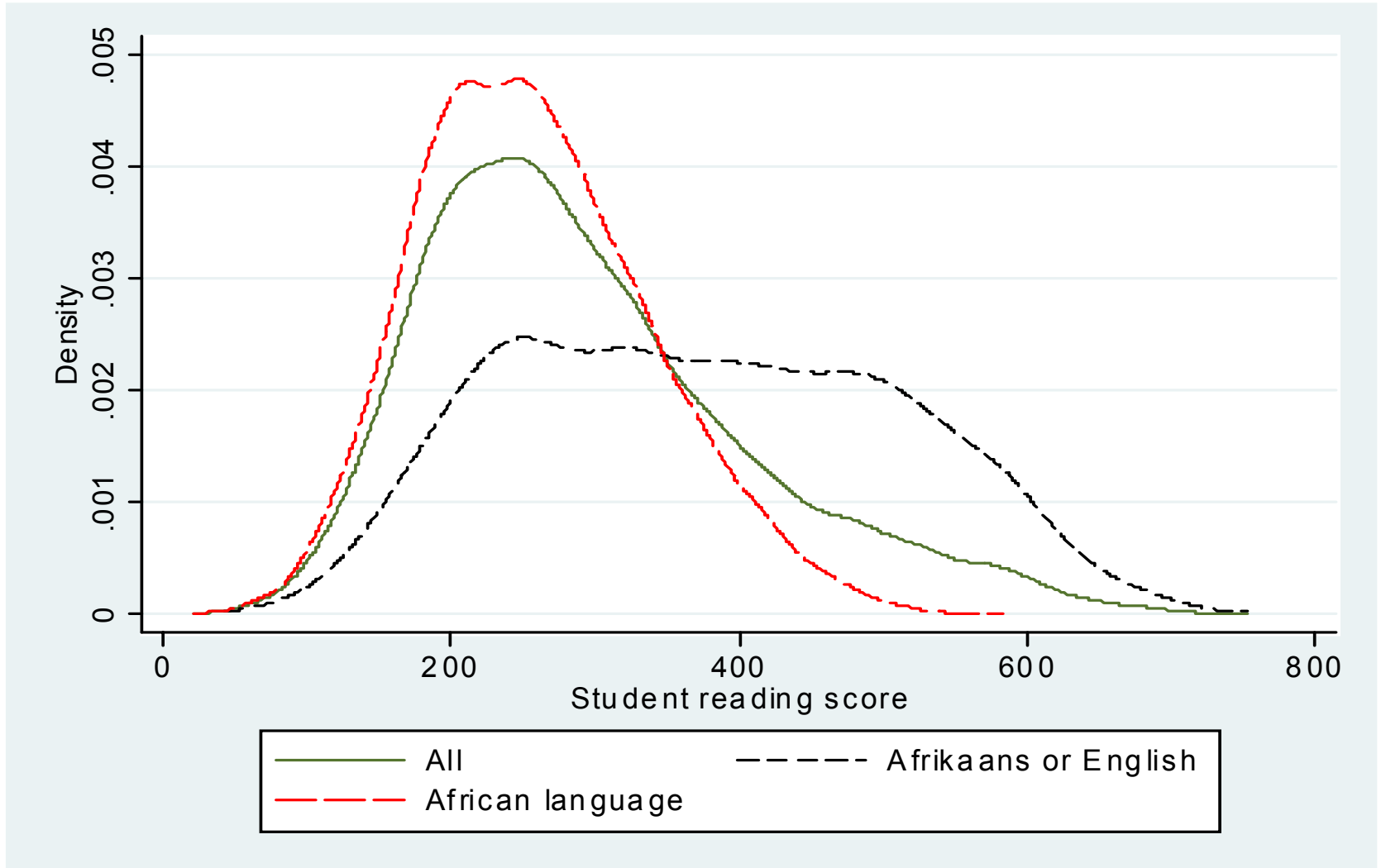
# Multivariate regression

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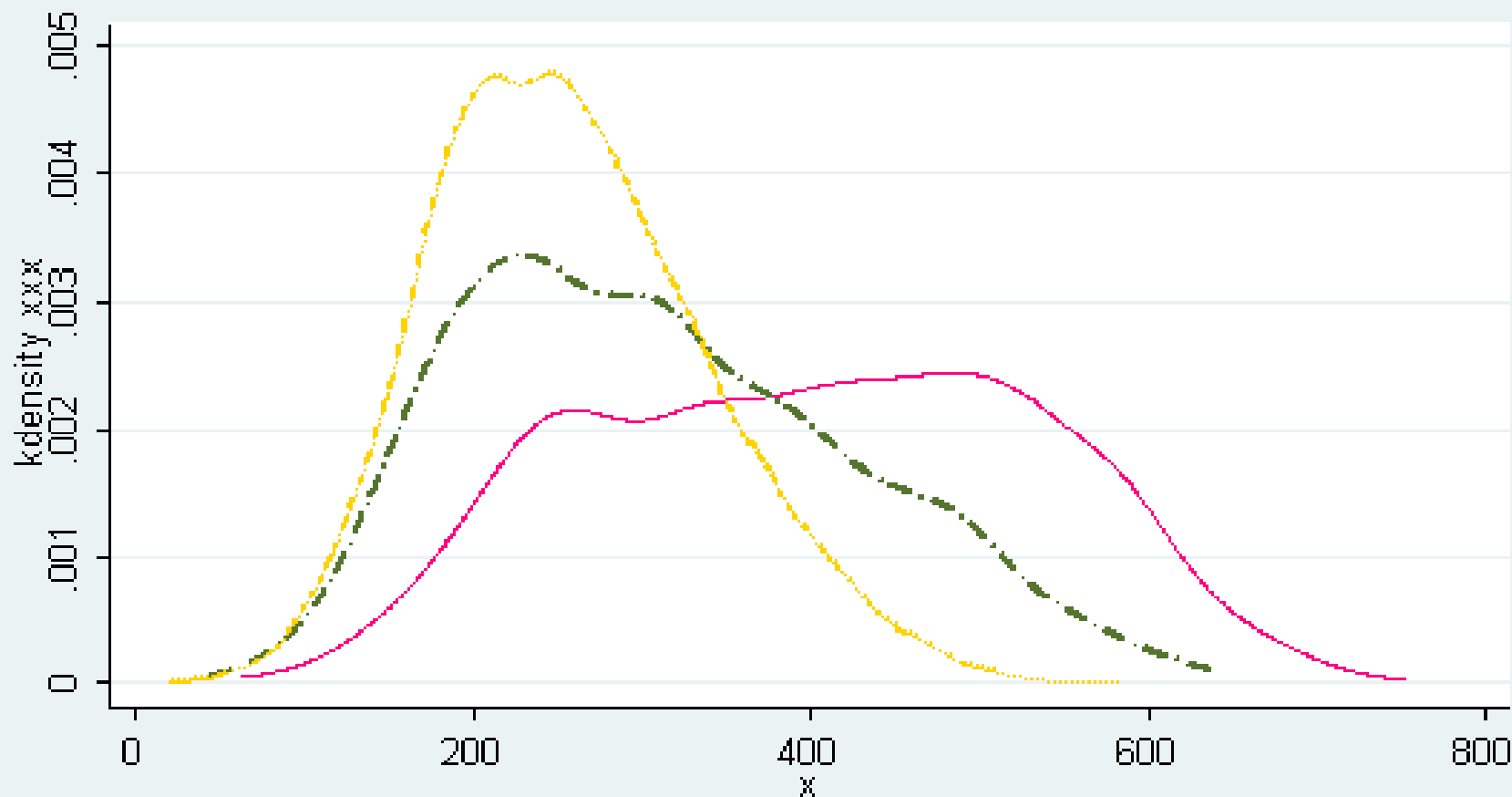
- This is presented in full paper.
- Was done including a large selection of student-level variables, teacher characteristics and school-level variables.
- Coefficient on student SES became smaller as variables were included, but remained substantial and statistically significant in full model.
- The inclusion of school mean SES substantially increased the explanatory power of the model.
- Coefficient on school mean SES was considerably larger than that on student SES.

# Decomposing into 2 historically different school systems

Figure 5: Kernel Density Curves by language of test

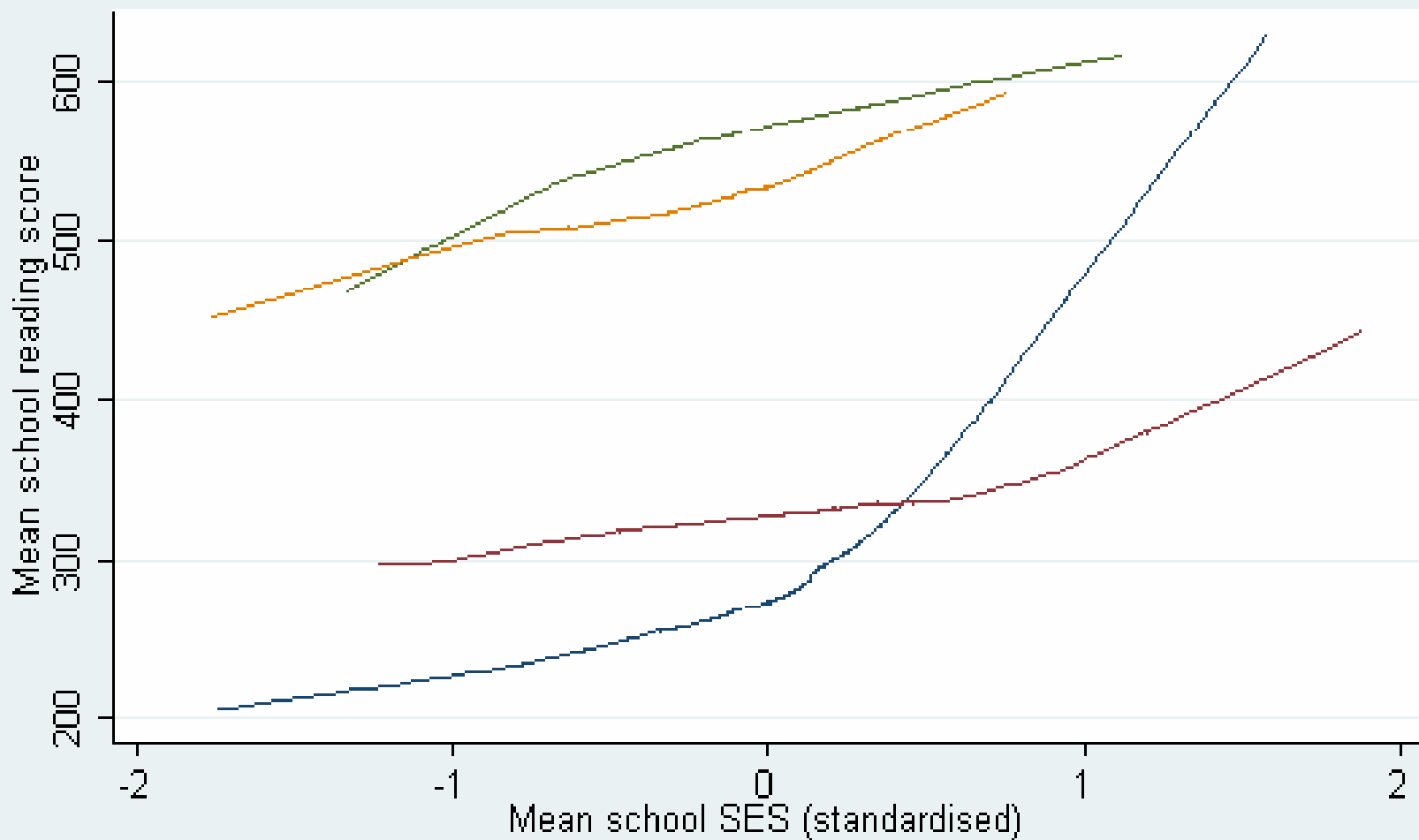


**Figure 6: Kernel density curves by language of test**

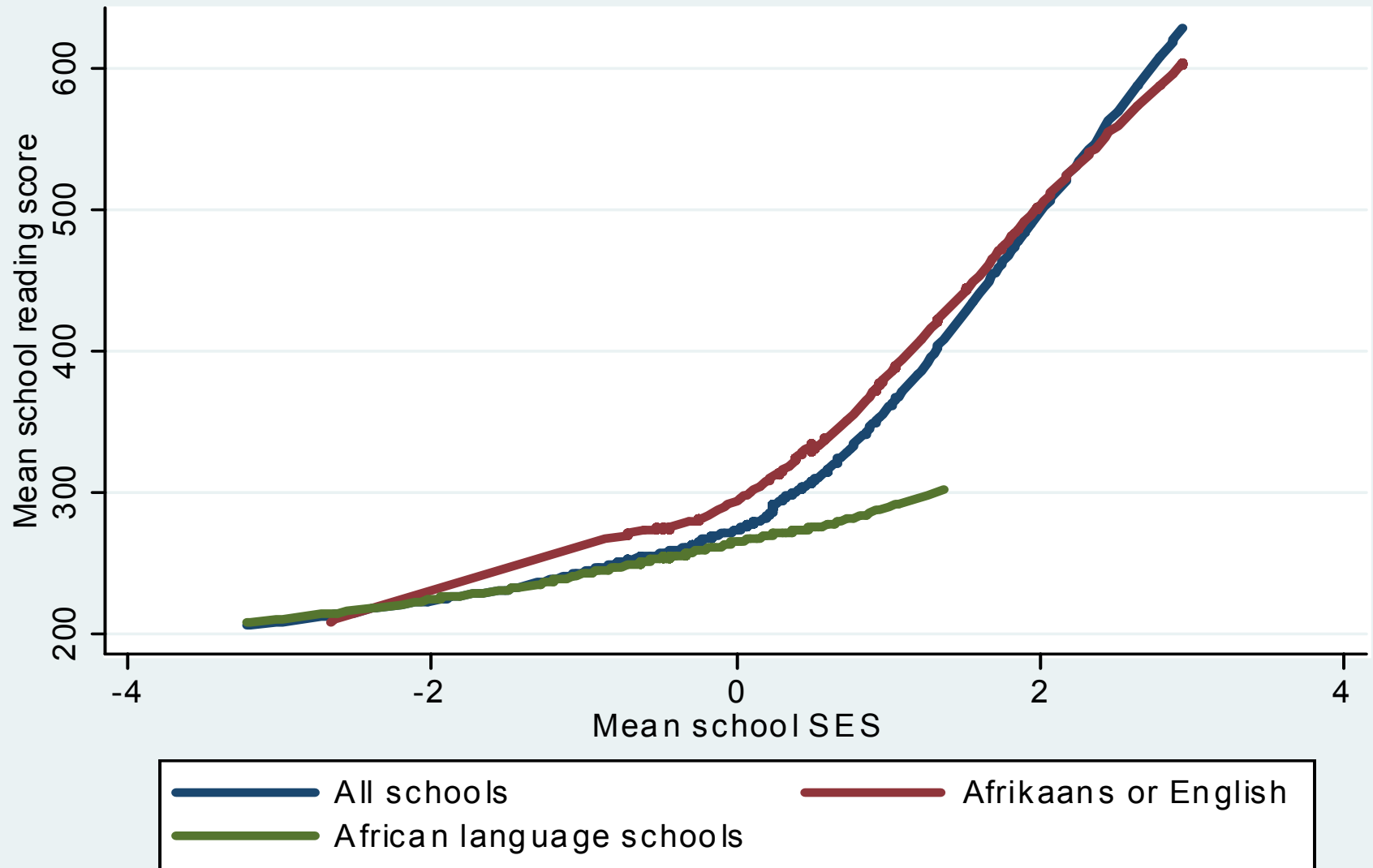


- Afrikaans or English: more than 25% of pupils always speak language
- - - English: 25% or less always speak English at home
- ... African language schools (all)

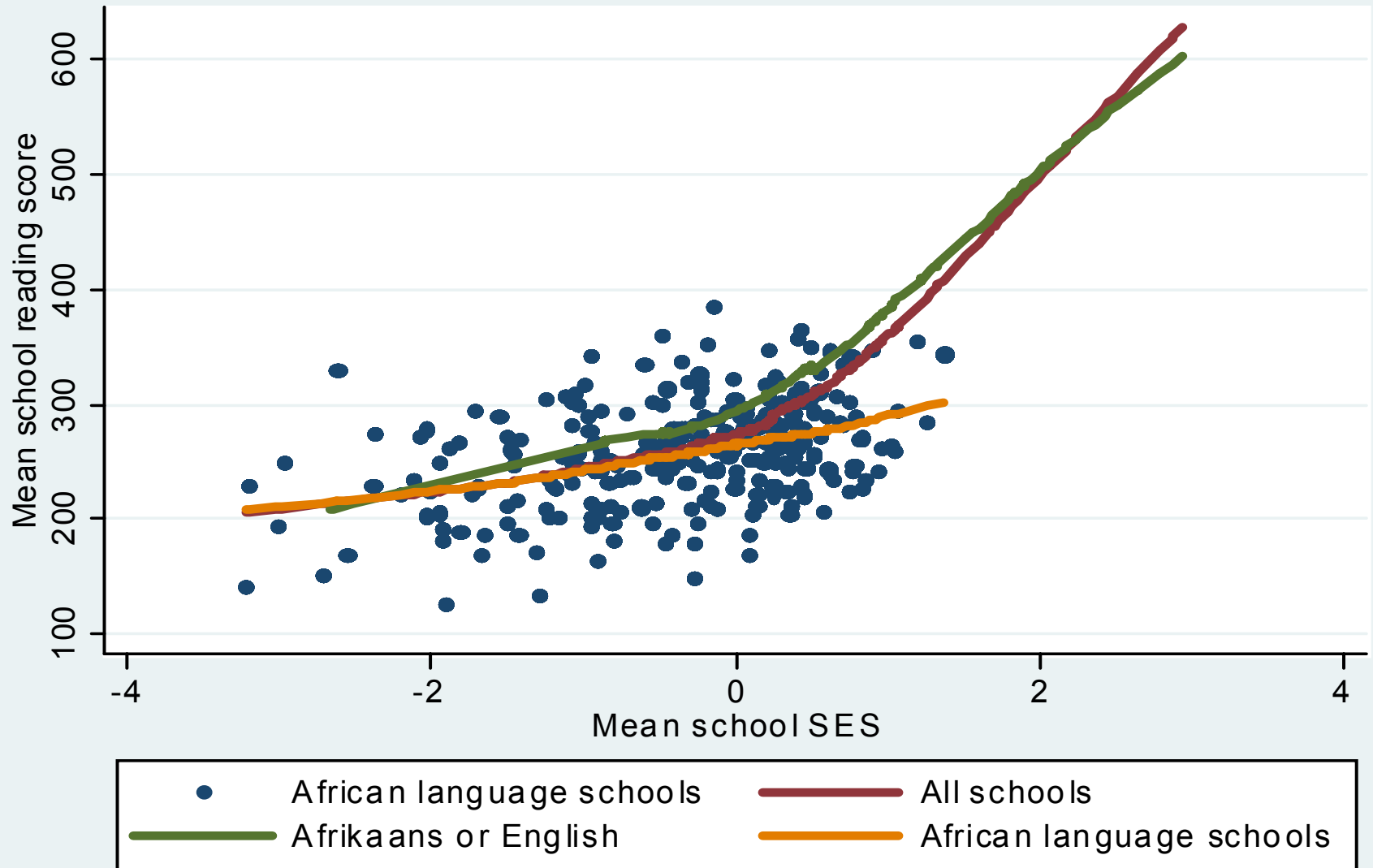
# Figure 7: Lowess regressions



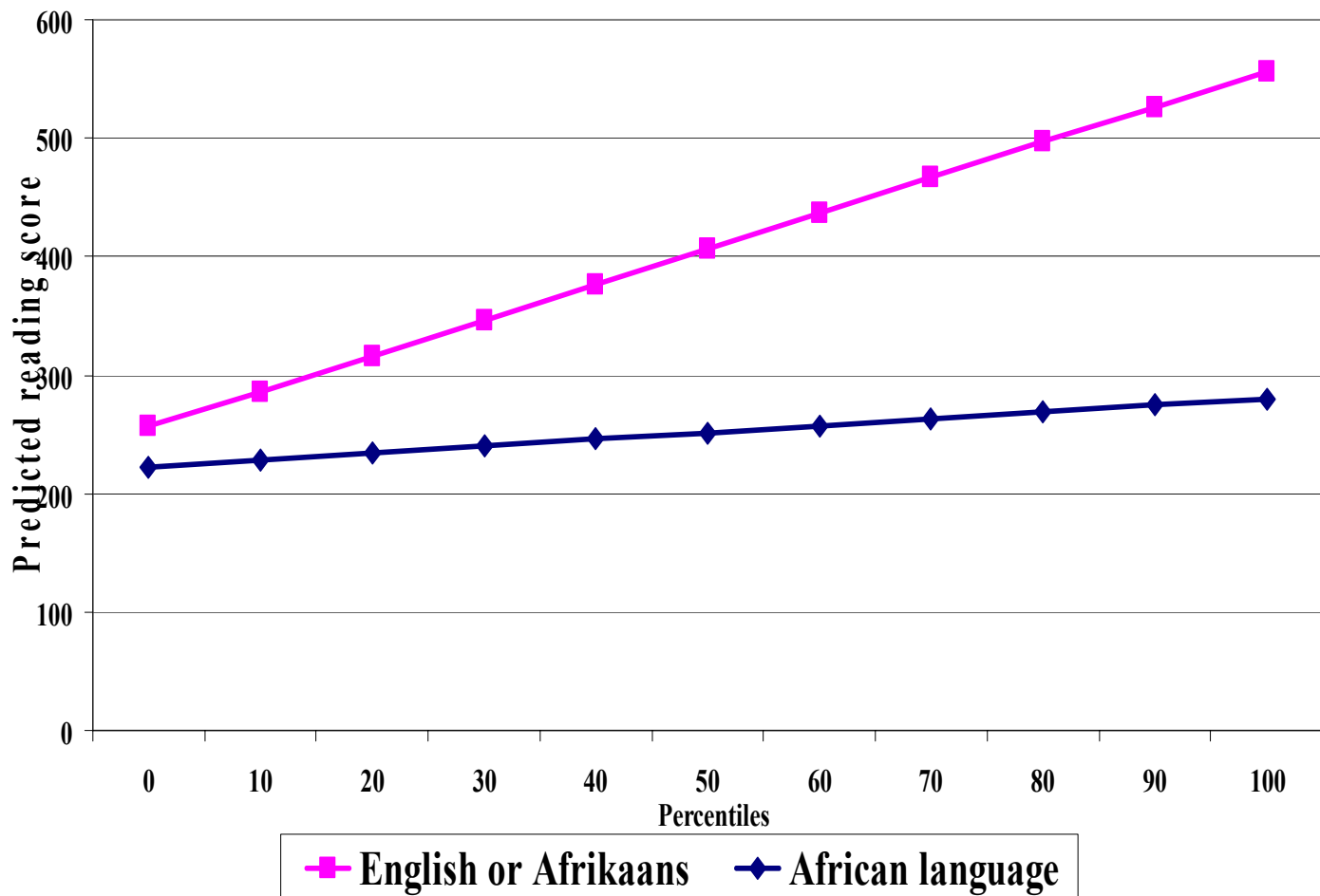
**Figure 8: Lowess regressions by language of test**



# Figure 9: Lowess regressions & scatterplot



# Figure 10: SES gradients by language of test



	Eng / Afr	African
Coefficient on SES	3.00	0.57
R-squared	0.33	0.04

# What about mobility?

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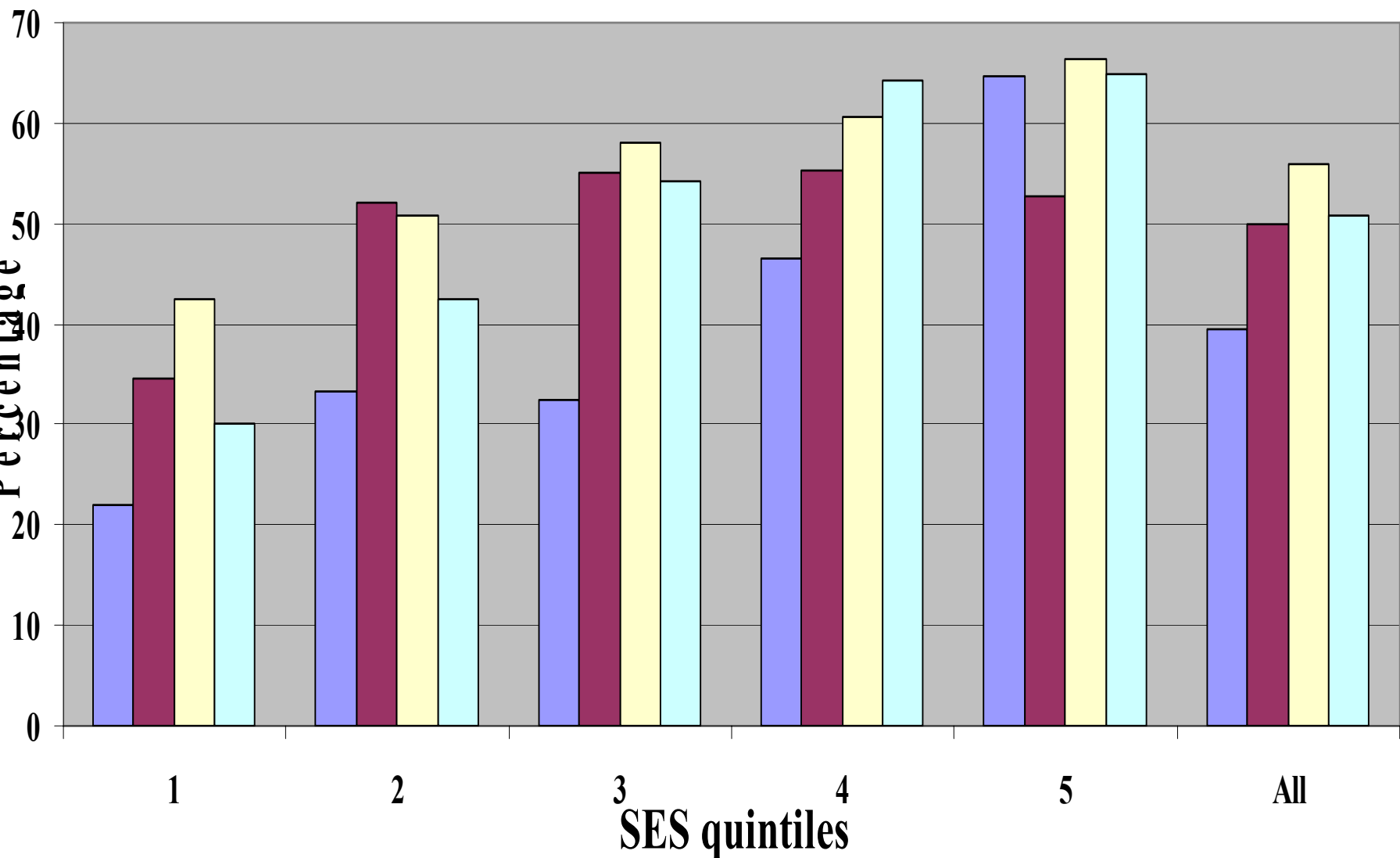
- Educational inequality reflects overall patterns of income inequality.
- Inequality is somewhat less troubling if there is real opportunity for social mobility.

Logic underlying the consideration of the prospects for social mobility:

- Scores in PIRLS → Ultimate educational attainment
- Education quality & attainment → Earnings

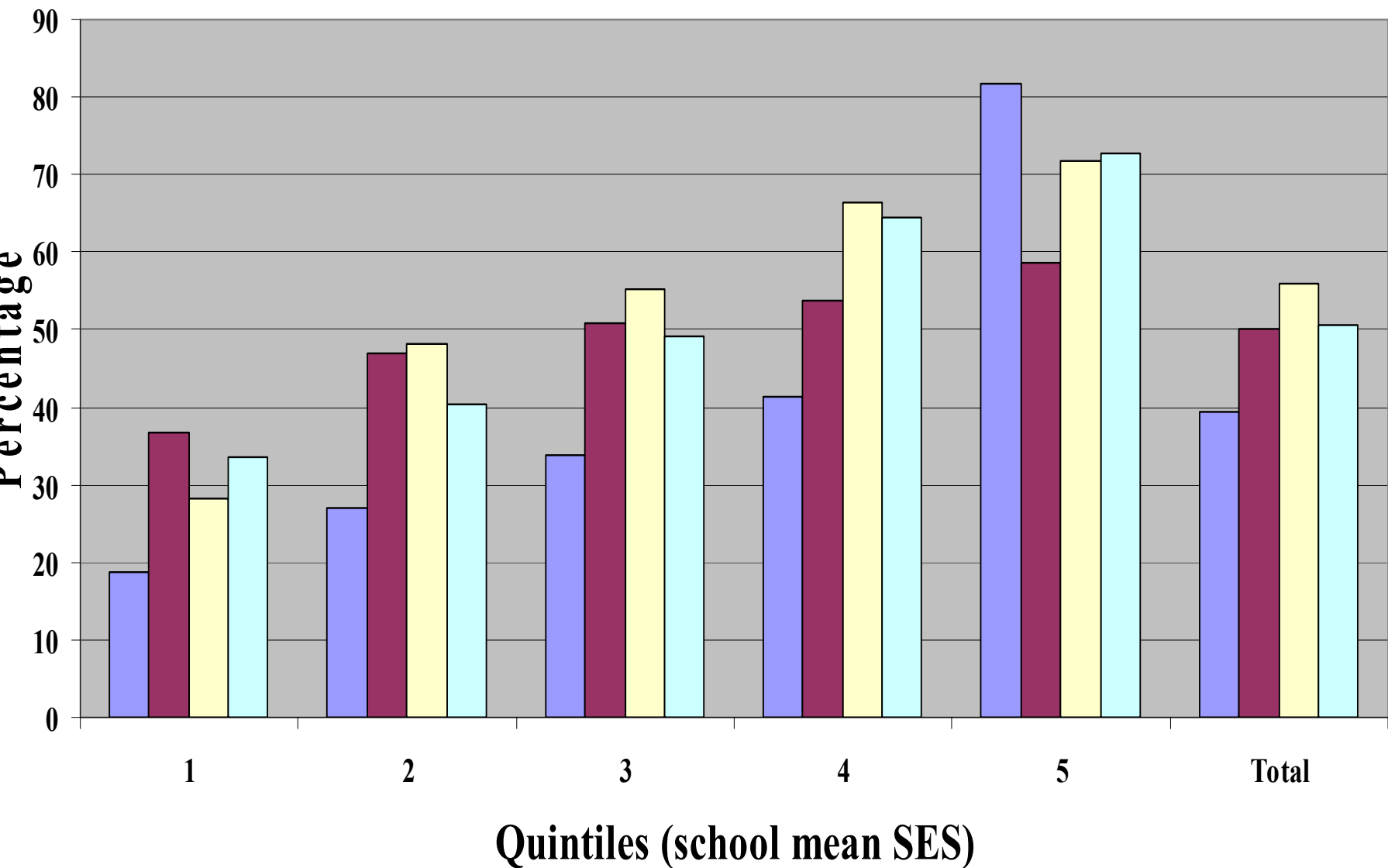
(Earnings functions literature, eg. Hanushek & Woessman, 2007)

**Figure 11: Proportion of students scoring above national average by SES quintile**



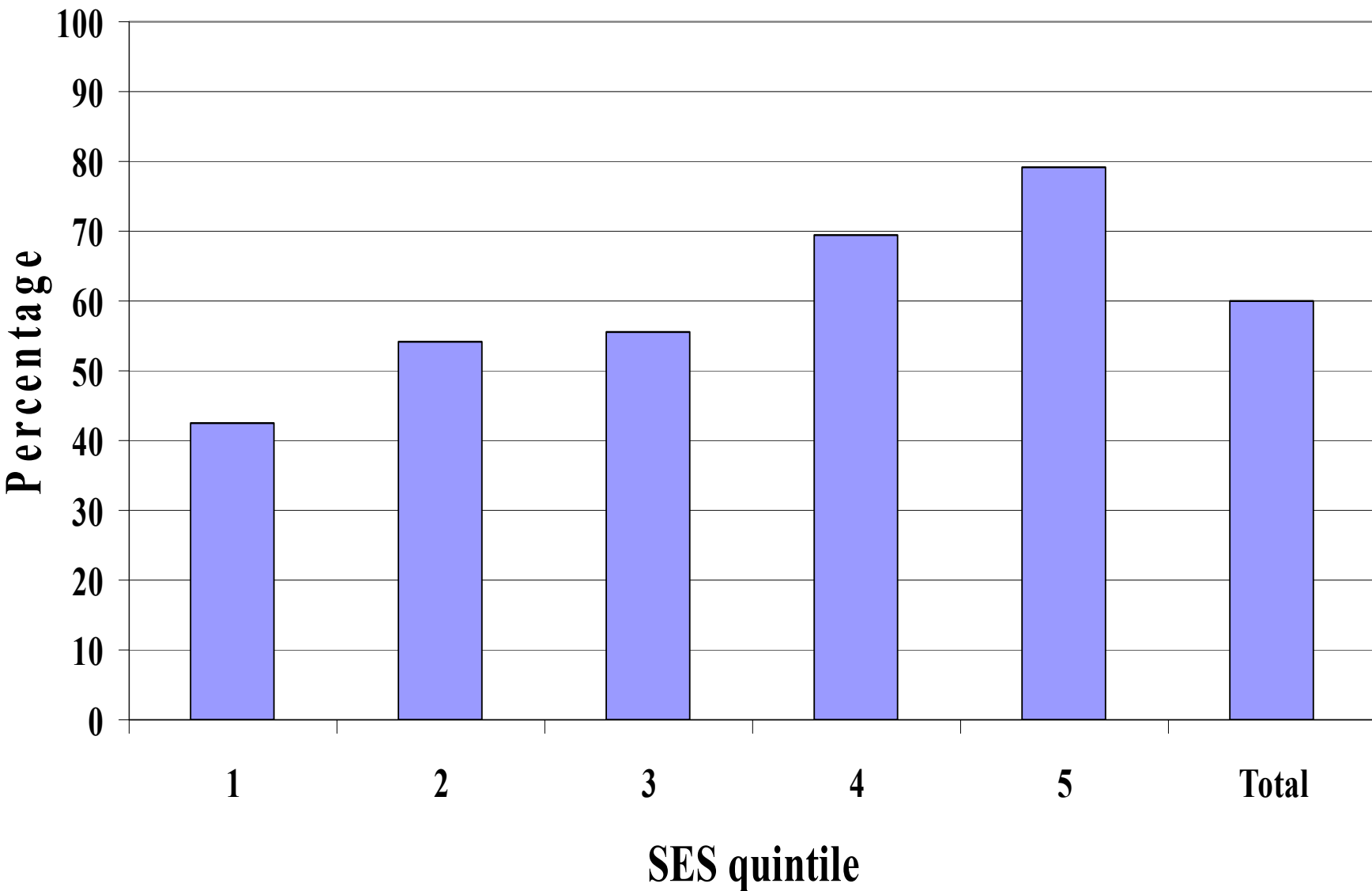
■ South Africa (302) ■ Morocco (323) ■ Russia (565) ■ USA (540)

**Figure 12: Proportion of students scoring above national average by school mean SES quintile**

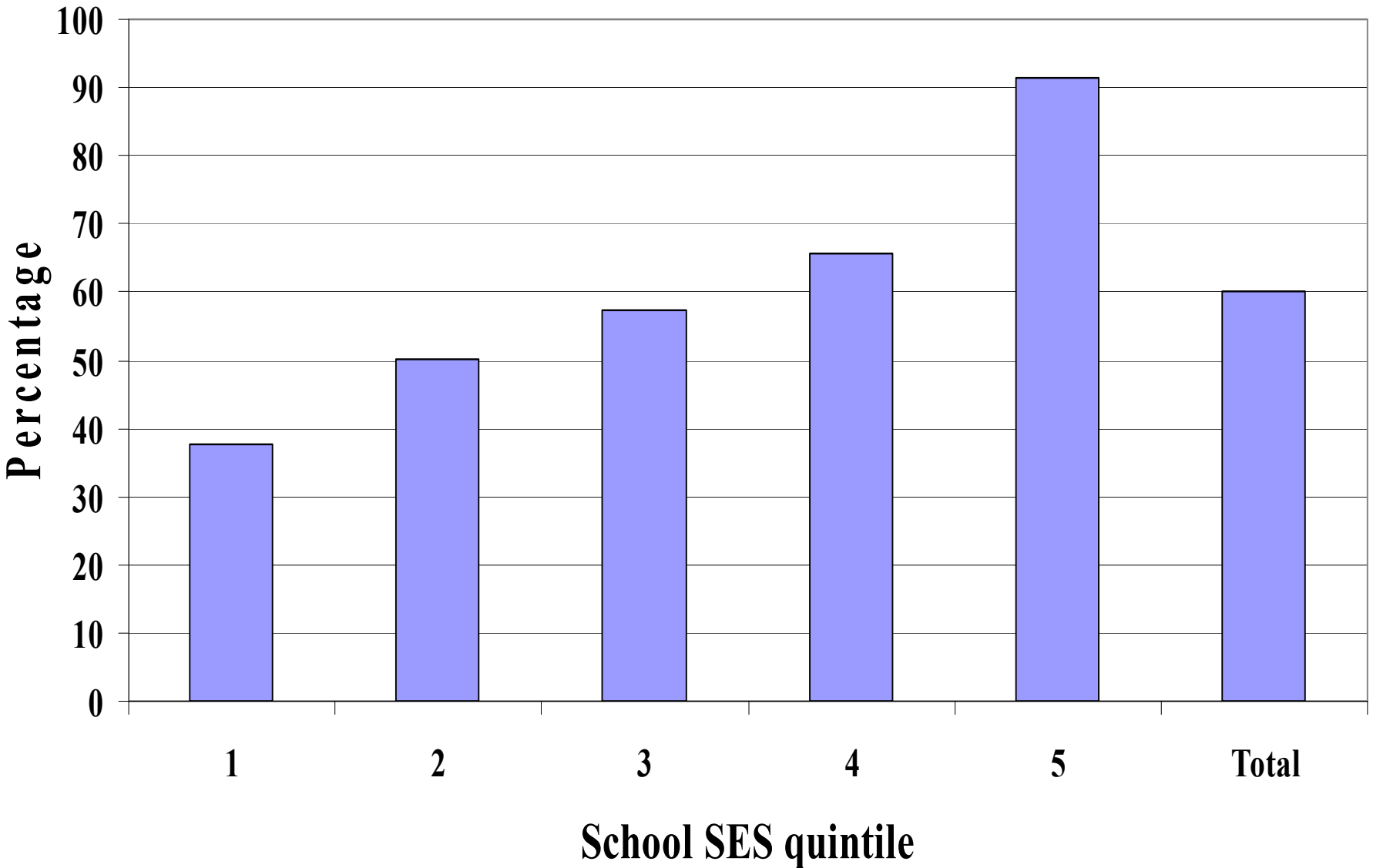


■ South Africa (302) ■ Morocco (323) ■ Russia (565) ■ USA (540)

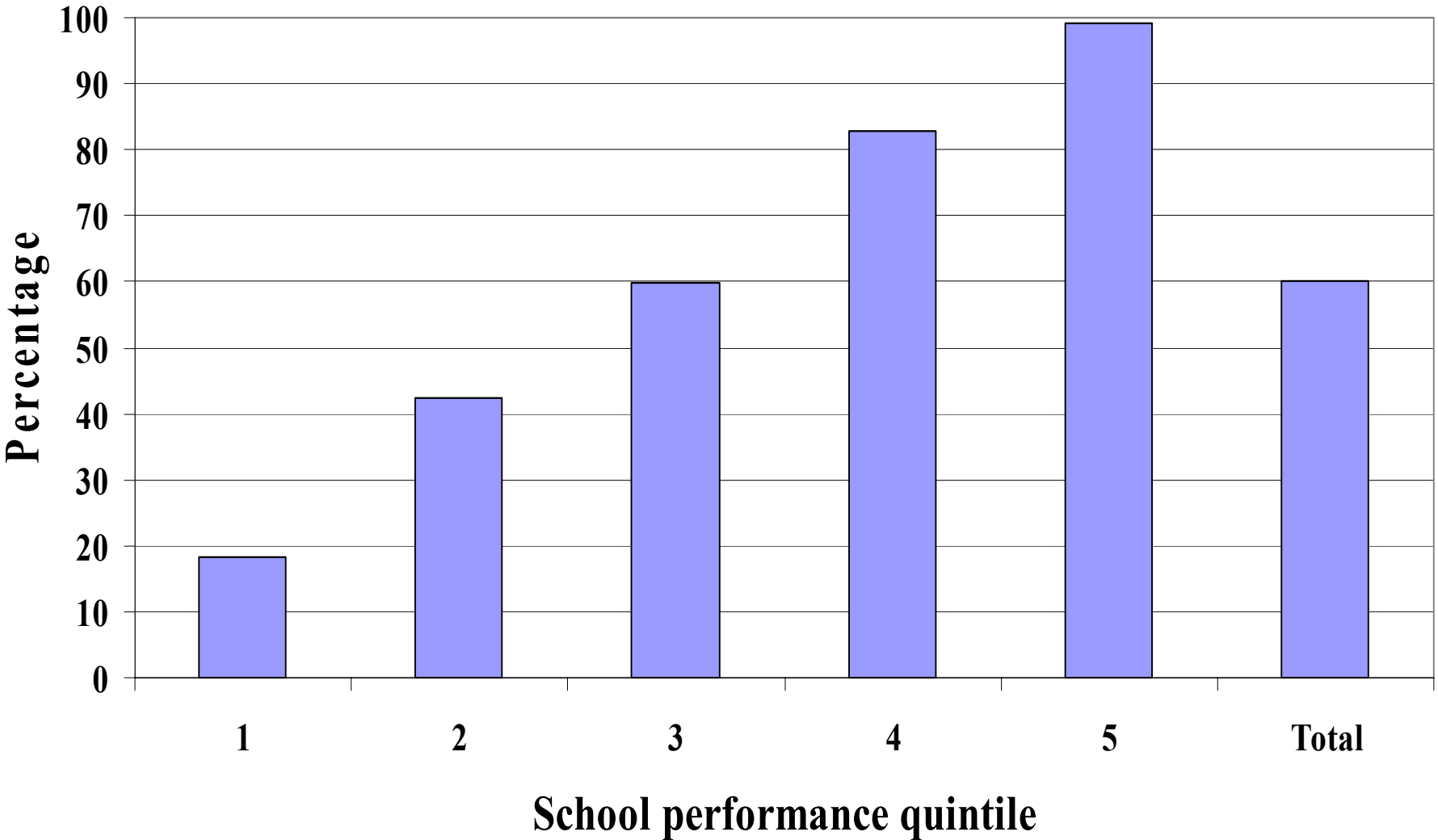
**Figure 13: Proportion of students scoring above unemployment rate guideline (247) by SES**



**Figure 14: Proportion of students scoring above unemployment rate guideline (247) by school mean SES**



**Figure 15: Proportion of students scoring above unemployment rate guideline (247) by school performance quintile**

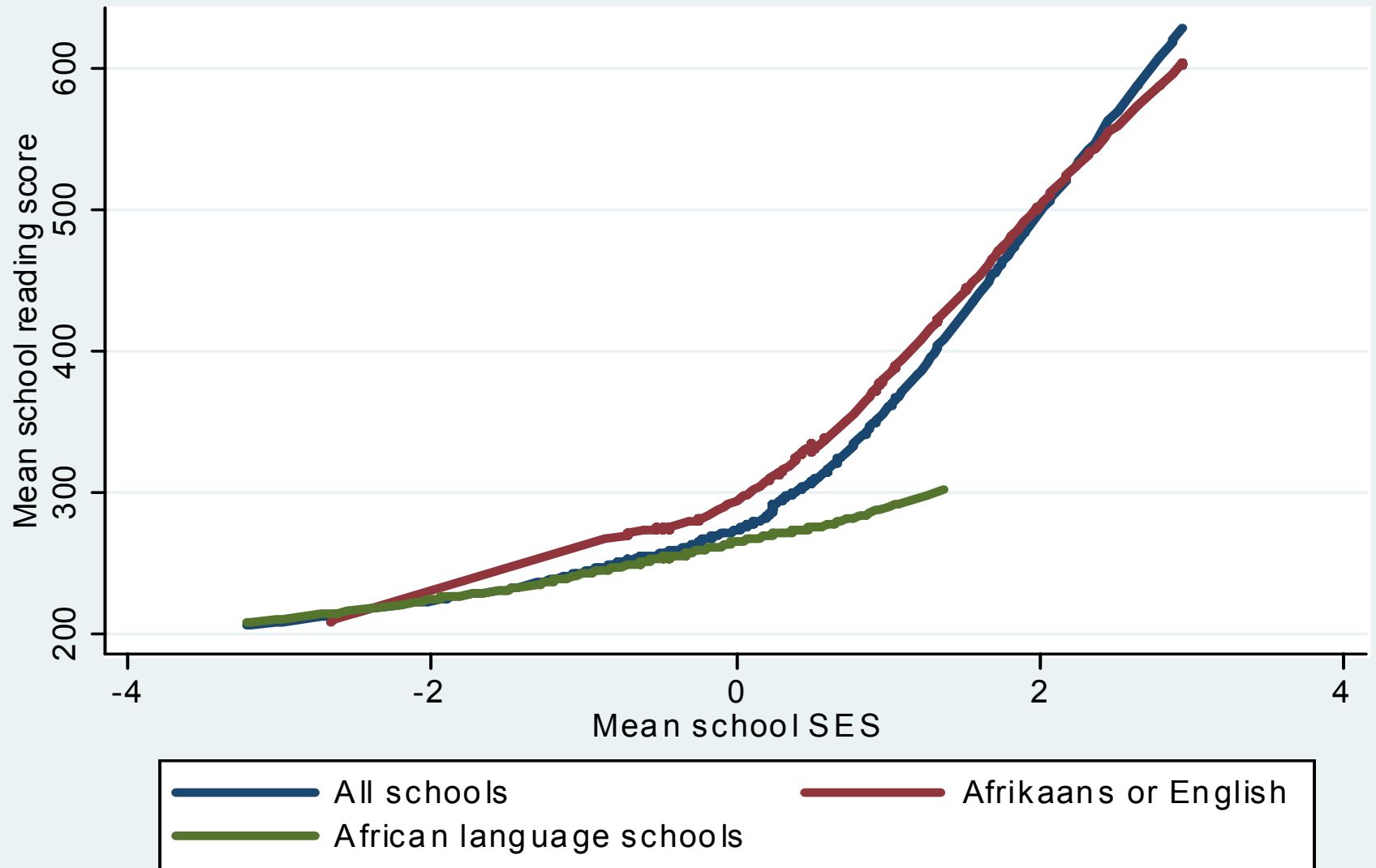


# Conclusions

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1. Very low overall level of performance in PIRLS
2. Wide variance of reading scores
3. SES accounts for a great deal of this variance.
4. Schools appear to be institutions that intensify the effect of SES on achievement, through the concentration of low SES peers, neighbourhood effects, etc.
5. Middle class black flight to predominantly white, Coloured and Indian schools.
6. These patterns are deepening the division between what are essentially two education systems.

**Figure 9 (repeated): Lowess regressions by language of test**





The End

