



Researching education, improving learning

Research for Education

Socioeconomic Segregation and Educational Inequality: Evidence from International Assessments

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Perspectives

- Starting point: Racial segregation in US schools
 - A product of policy
- International analogies: wealth & poverty
- Purposes of education:
 - Human Capital
 - Social Mobility

Overarching Questions

- What is socioeconomic (SES) segregation?
- How much SES segregation is there?
- Why does SES segregation matter?
- What should we do about it?

Defining Terms

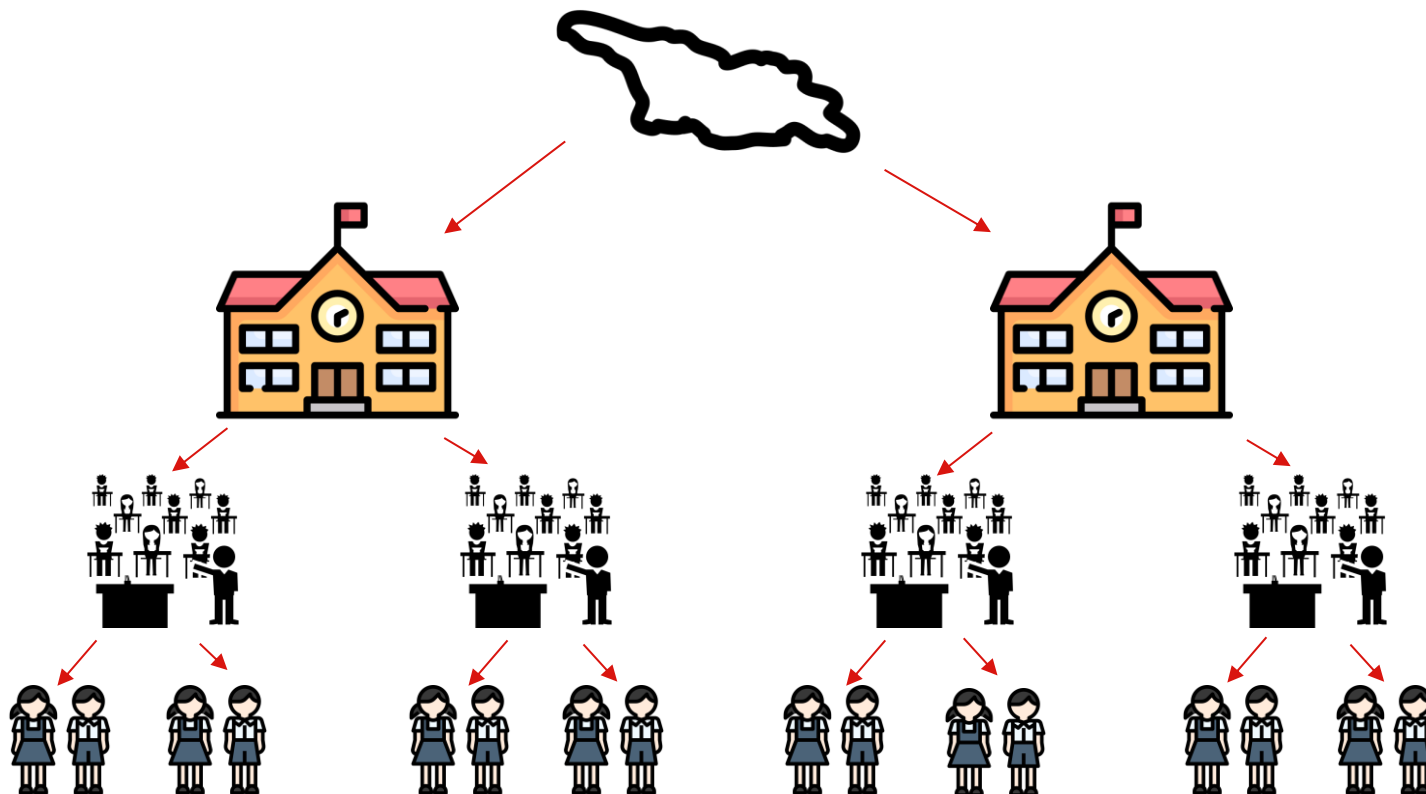
- Socioeconomic Status
 - Family wealth/income
 - Family occupation
 - Family education

Defining Terms

- Segregation
 - Student Sorting vs. Student Segregation
 - Sorting
 - General term
 - Allocating students to different settings
 - Segregation
 - Specific term with negative connotations
 - Due to deliberate policy or informal practices

Student Sorting Is Intrinsic to Education

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Student Sorting is Intrinsic to Education

- Between schools
- Between classrooms
- Even more complicated!
 - Between districts
 - Within classrooms
 - Public vs. Private & Religious

Research Base

- Focused on between-school, later grades
- Tracking
- Inequalities
 - School resources
 - Teacher quality
 - Curriculum
 - Peer effects
- U.S. research – race
- International research – SES, gender, immigrant, language

Research Base

- Within-school sorting?
 - Systematically underestimate total amount of segregation
- Earlier grades?
- Trends?

The Problem of Data

- Need measures of student SES:
 - Across time
 - Multiple grades
 - Between schools
 - Between classrooms
- If want to relate to outcomes, also need achievement data

IEA Studies

- Assessments since 1995
- 4th and 8th grade
- Random selection of intact classrooms with schools
- TIMSS, PIRLS, CIVED/ICCS
- Standardize scores across subjects

Why Not PISA?

- Index measure of SES back to 2000, but...
 - Only 15 year olds
 - Random selection of students (not classrooms) within schools
 - No way to identify within-school segregation

Measuring SES

- Exhaustive review of all IEA items related to student SES
 - Gardner & Zuschlag
 - Researchers should use this!
- HER Index not consistent back to 1995
- Student survey items
- Books in the Home
- Broer et al. (2019) measure

Measuring SES Segregation

- D-index measure of segregation:

$$D = \frac{1}{2} \left(\sum_{i=1}^N \left| \frac{a_i}{A} - \frac{b_i}{B} \right| \right)$$

- Really two measures:
 - Segregation of poor students
 - Segregation of rich students

What do you mean “poor”?

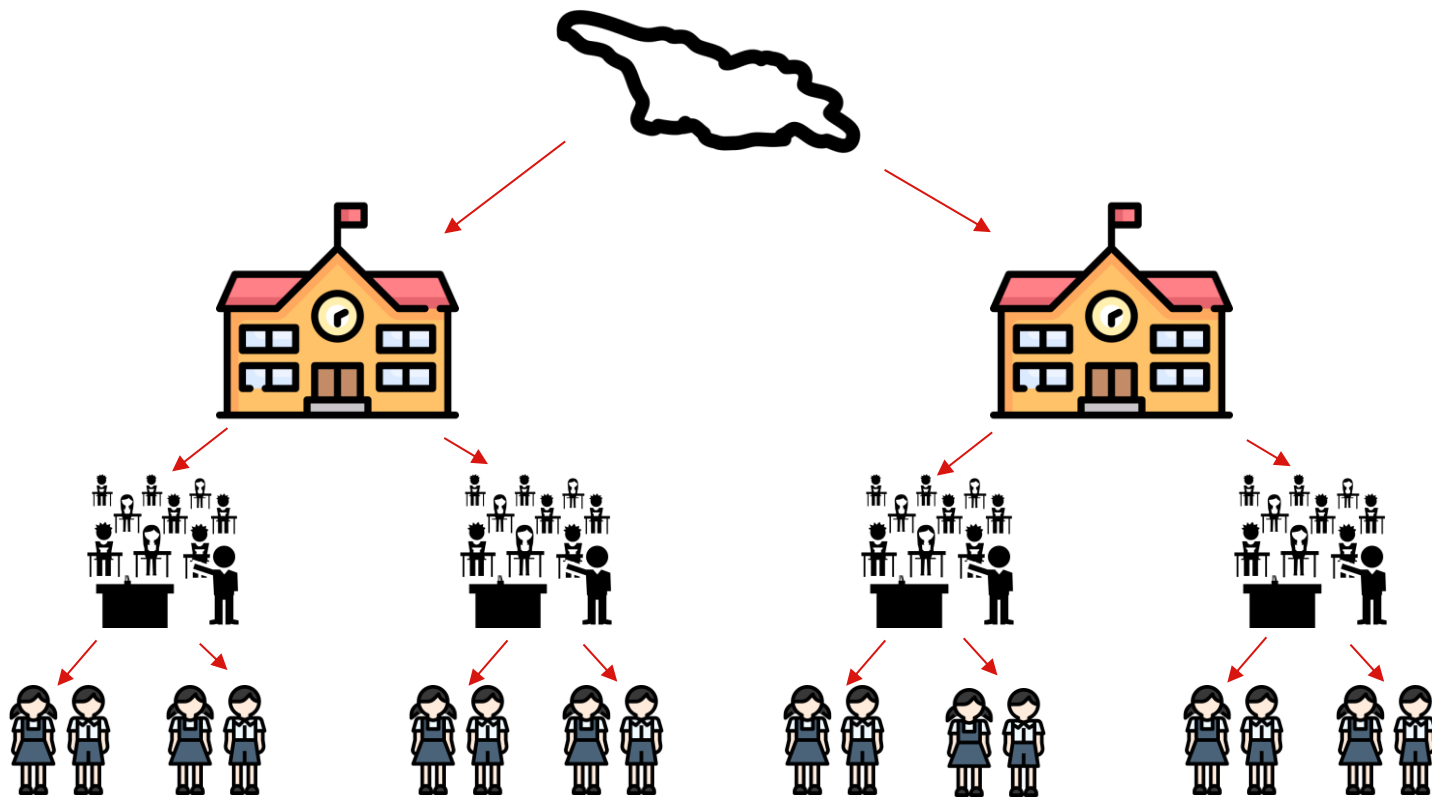
- Shorthand for students from higher or lower-SES families
- Question of threshold for “poor” and “rich”
- Absolute measure: books in the home
 - Highest and lowest category
 - Consistent across countries
- Relative measure: Broer index
 - Top 25% and bottom 25% in each country
 - Variable definition by countries
- Good news: Doesn't matter that much

Measuring **Total** SES Segregation

- Traditional measure of SES segregation is between-school only
- Experimental measure also includes within-school (between-classroom) SES segregation
 - Caution – not all IEA studies have schools with more than one classroom!

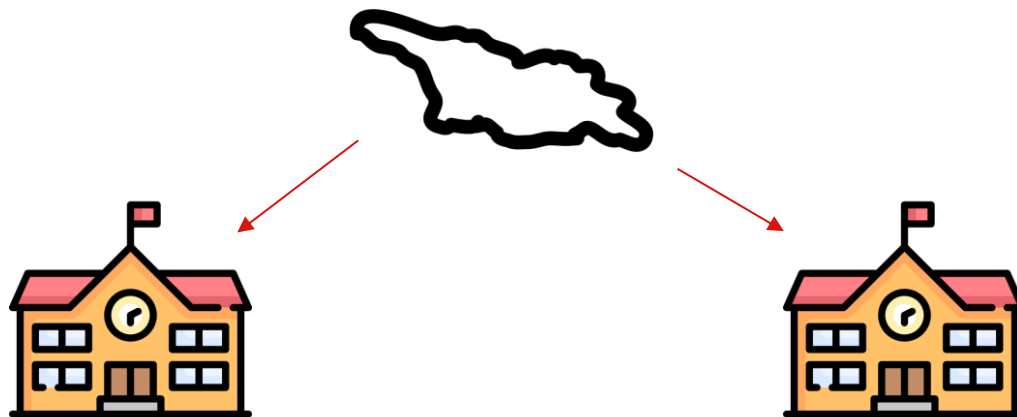
Total Segregation Measure

18



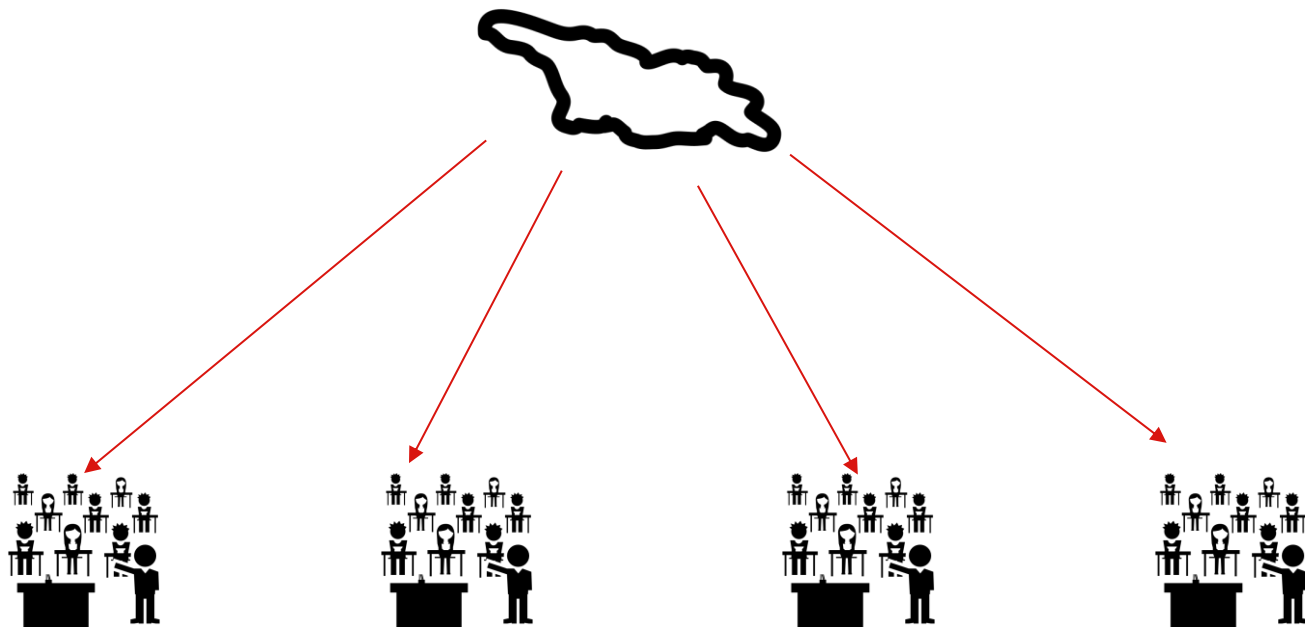
Traditional Segregation Measure

19



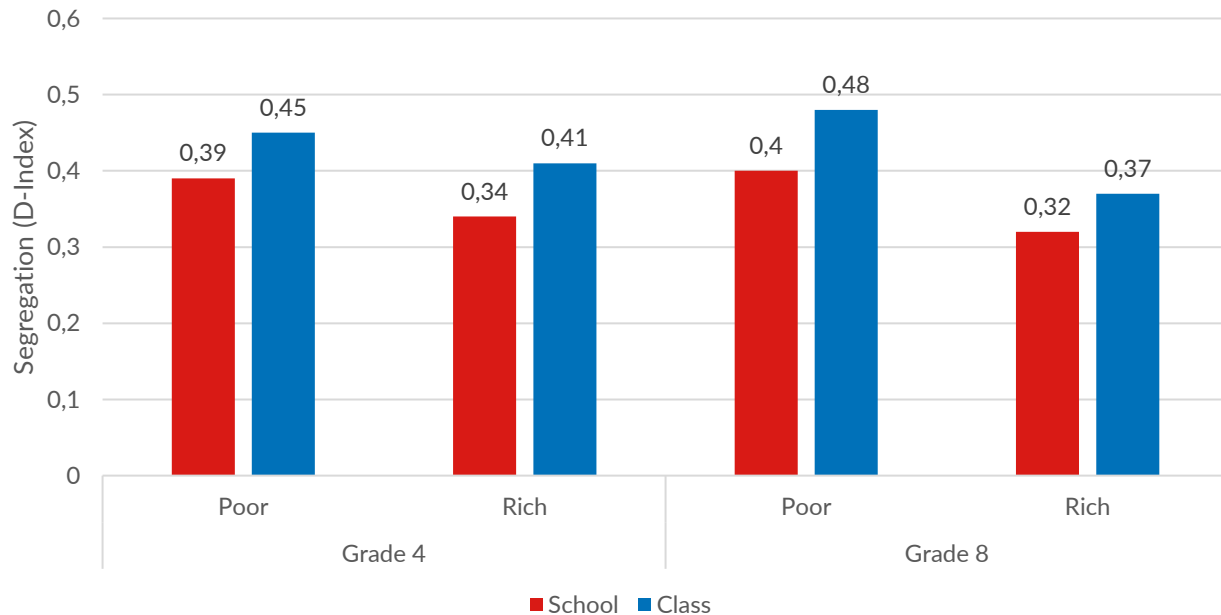
Experimental Segregation Measure

20



How Much SES Segregation Is There?

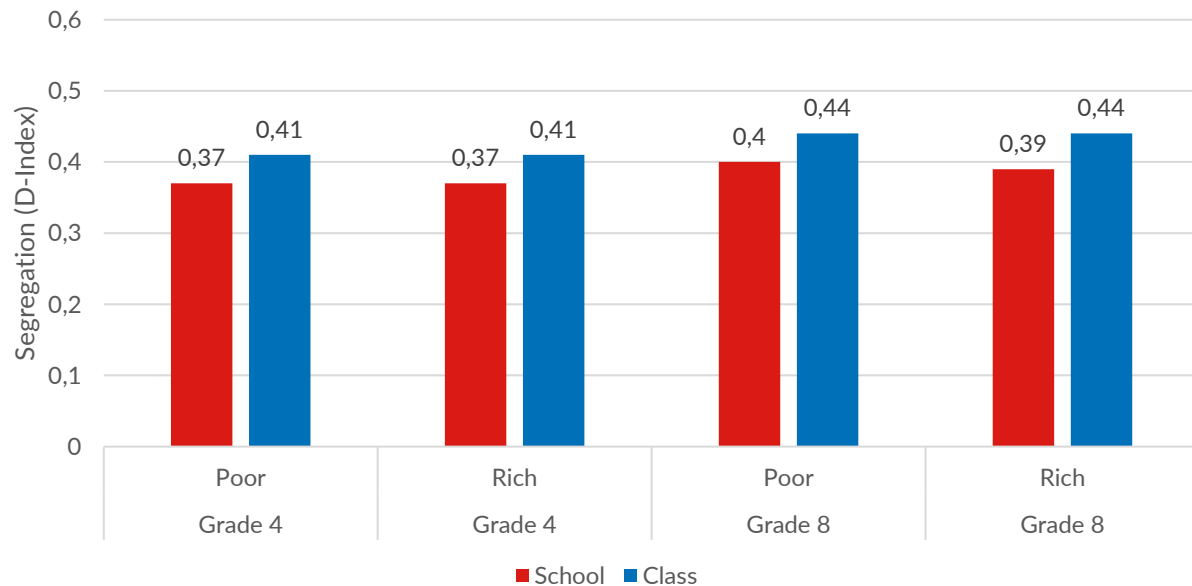
21



Absolute Measure

How Much SES Segregation Is There?

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Relative Measure

Key Takeaways

- There is substantial within-school sorting by SES
- Comparable in 4th and 8th grades
 - This is happening for younger students too!
- Traditional between-school measure underestimates SES segregation
 - If include all countries, 3 points higher when account for between-classroom
 - If just countries with average of more than one classroom, segregation is ~7 points higher (14%).

Does SES segregation vary across time?

- Previous tables averaged within each country across years
- Mostly consistent across time
 - Low variation
 - Most variation across countries, not within countries
 - Trends are very small even when statistically significant

Does SES Segregation Matter?

- Relation to average country achievement
- Relation to equity in achievement
 - Disequalizing
 - Compensatory
 - Neutral

Statistical Strategy

- Country-level analyses
 - Fixed-effects regression
 - Synthetic cohort
- Student-level analyses
- Both absolute and relative measures of SES

SES Segregation Doesn't Improve Average Outcomes²⁷

- Countries with higher SES segregation do not have statistically higher average test scores on TIMSS, PIRLS, and CIVED/ICCS
- Countries with higher SES segregation tend to have larger SES achievement gaps
 - Weaker results using synthetic cohort models

SES Segregation & Country-Level Outcomes

		Books		Broer	
Model	Outcome	Poor	Rich	Poor	Rich
Grade F.E.	Mean scores	-30.25 (24.68)	-46.14 (31.94)	-34.44 (37.53)	-38.93 (42.95)
Grade 4, subject F.E.	Mean scores	30.89 (40.38)	-56.49 (41.98)	-37.86 (43.36)	-60.35 (90.76)
Grade 8, subject F.E.	Mean scores	-19.14 (29.82)	-29.70 (46.49)	-22.37 (53.64)	-9.65 (45.83)
Grade F.E.	SES Gap	51.47* (18.20)	61.18* (22.07)	168.19* (35.40)	184.25* (34.57)
Grade F.E.	Variance	26.27* (10.56)	43.83* (10.61)	55.56* (16.34)	54.93* (18.31)

SES Segregation Doesn't Improve Individual Outcomes

- Modeled individual student-level outcomes for all assessments in every country between 1995 and 2019
 - Van Vliet did heroic work on these analyses
- Being in a segregated school did not improve outcomes
- Poorer students did worse when in more segregated schools

SES Segregation & Individual Outcomes

	Books		Broer	
Variable	Poor	Rich	Poor	Rich
Student SES	15.87* (0.39)	17.22* (0.28)	12.91* (0.22)	12.76* (0.13)
Male	-1.45* (0.19)	-1.48* (0.20)	-1.28* (0.22)	-1.36* (0.24)
Language of the test	23.46* (0.56)	24.29* (0.51)	18.71* (0.73)	19.24* (0.67)
Segregation	-1496.45* (135.74)	161.07 (109.02)	-550.34* (128.02)	155.04 (108.29)
SES x segregation	478.94* (59.00)	195.91* (32.35)	140.50* (25.77)	92.21* (13.83)

Limitations

- Measure of SES is incomplete
- Data availability
 - Complete classroom-level data for schools over time.
 - Likely underestimating total segregation
 - Hard to determine causal impacts
- Exploratory!

Key Findings

- Extensive SES segregation across countries
- Traditional measures underestimate the amount of SES segregation
- SES segregation exists both in earlier and later grades
- There is no clear trajectory in SES segregation
- SES segregation likely increases educational achievement gaps between high and low SES students
- Countries with higher levels of SES segregation do not see higher levels of mean achievement

Implications

- SES segregation is pervasive
- SES segregation doesn't further educational goals
 - Human capital: Doesn't improve overall scores
 - Social mobility: Likely increases inequality
- SES segregation can be reduced

Thanks!

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