

# How to Make Additional Time Matter: Integrating Individualized Tutorials into an Extended Day

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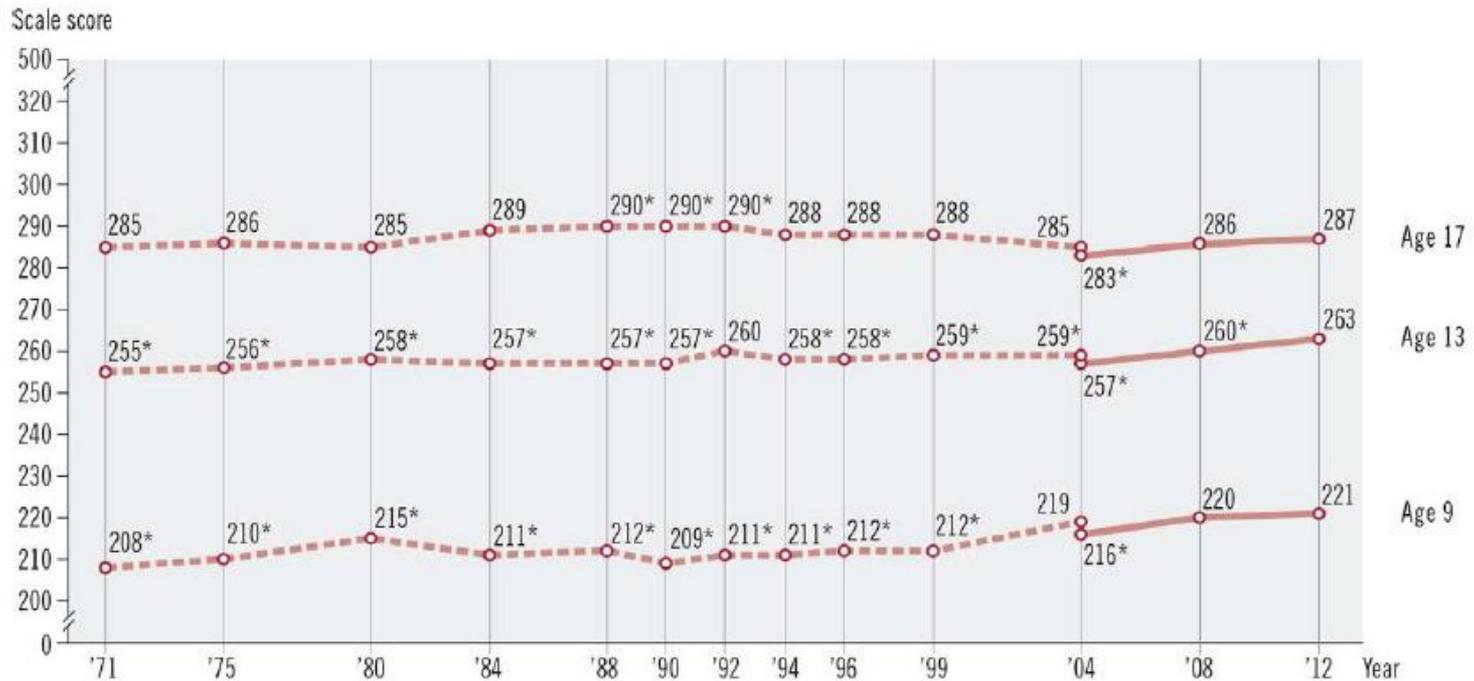
**12th Itaú International Seminar on Economic  
Evaluation of Social Projects**

# The U.S. Educational Context

Gradual improvement and  
persistent challenges

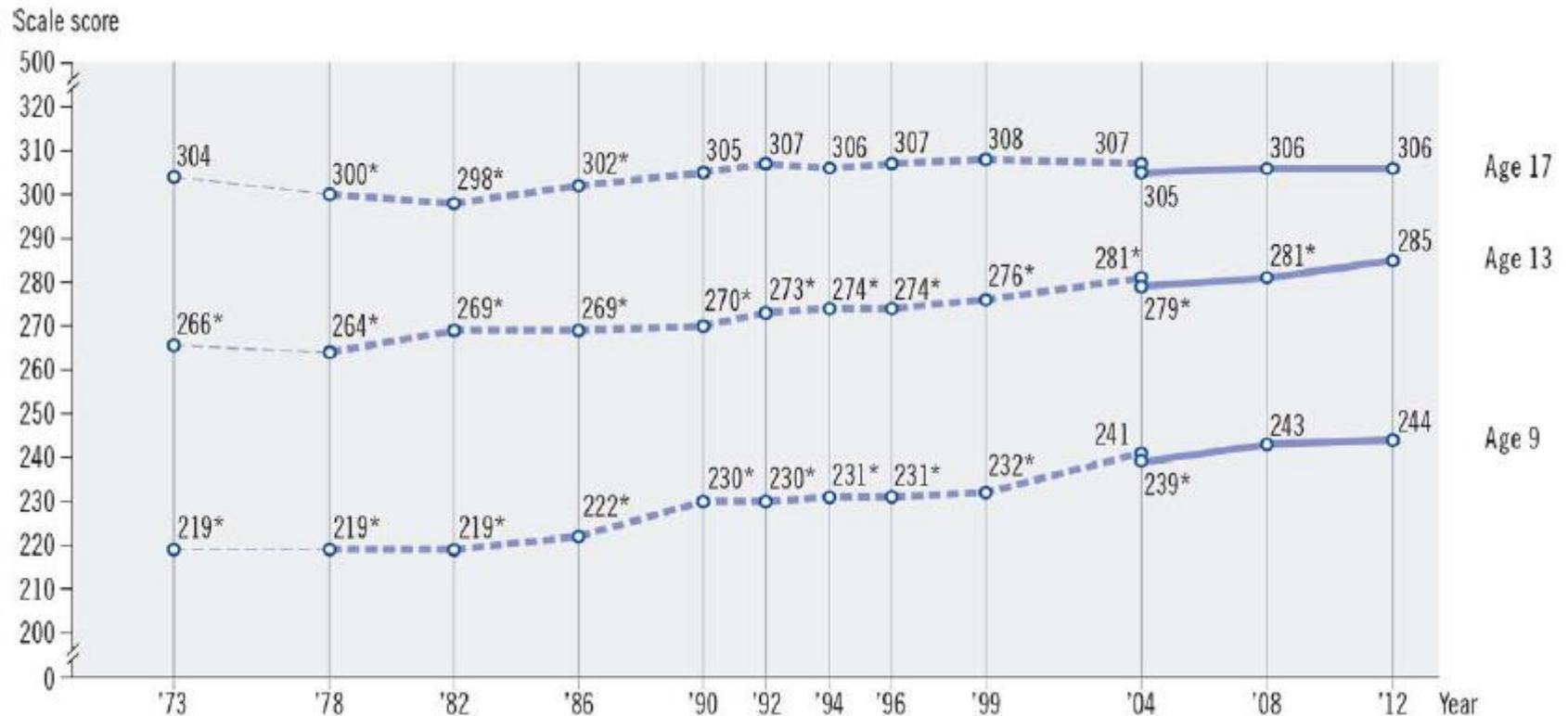
# Trends in Reading Scores

## National Assessment of Educational Progress



# Trends in Mathematics Scores

## National Assessment of Educational Progress

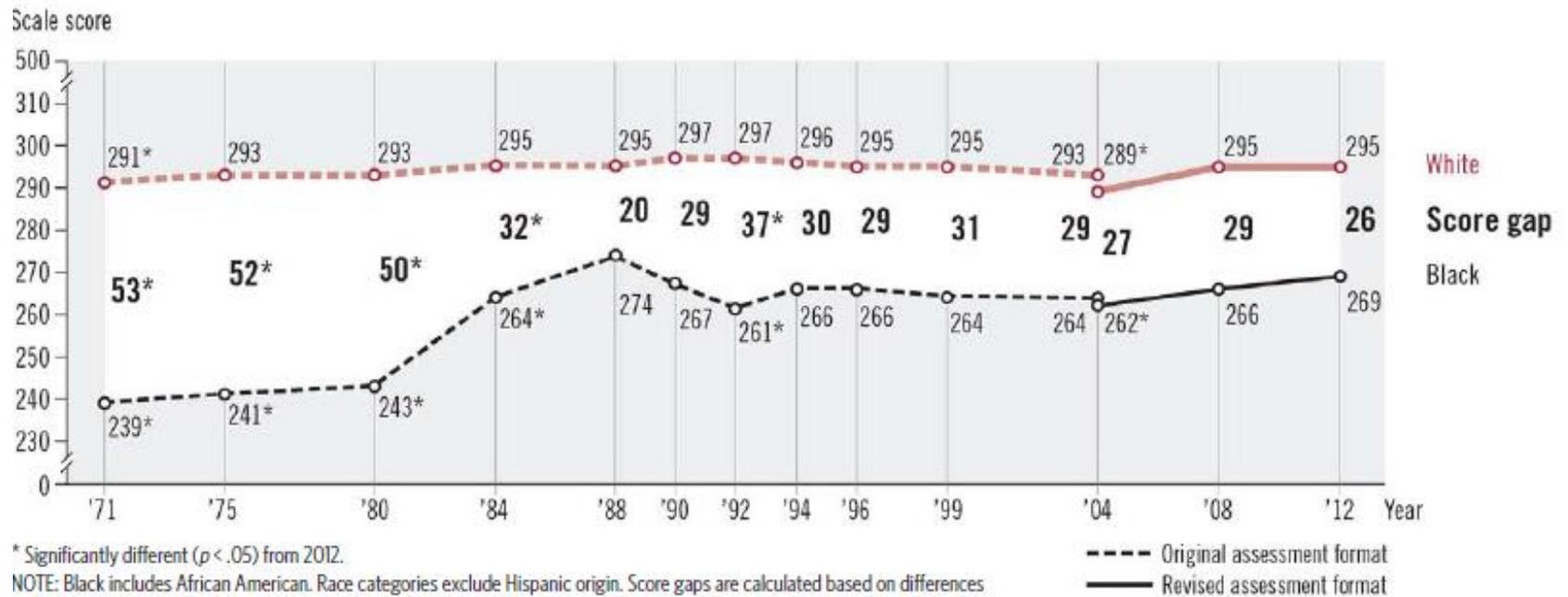


\* Significantly different ( $p < .05$ ) from 2012

Extrapolated data adjusting for the limited number of questions from the 1973 mathematics assessment in

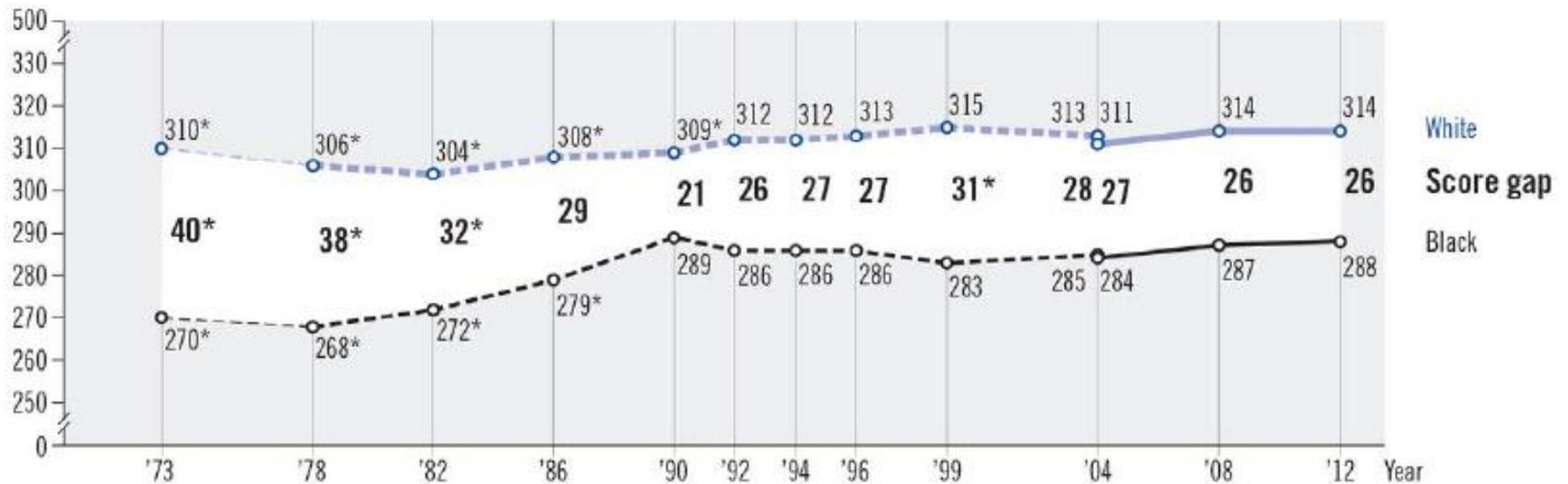
# The Black-White Achievement Gap

## Reading Scores (17-year olds)



# The Black-White Achievement Gap

Mathematics Scores (17-year olds)

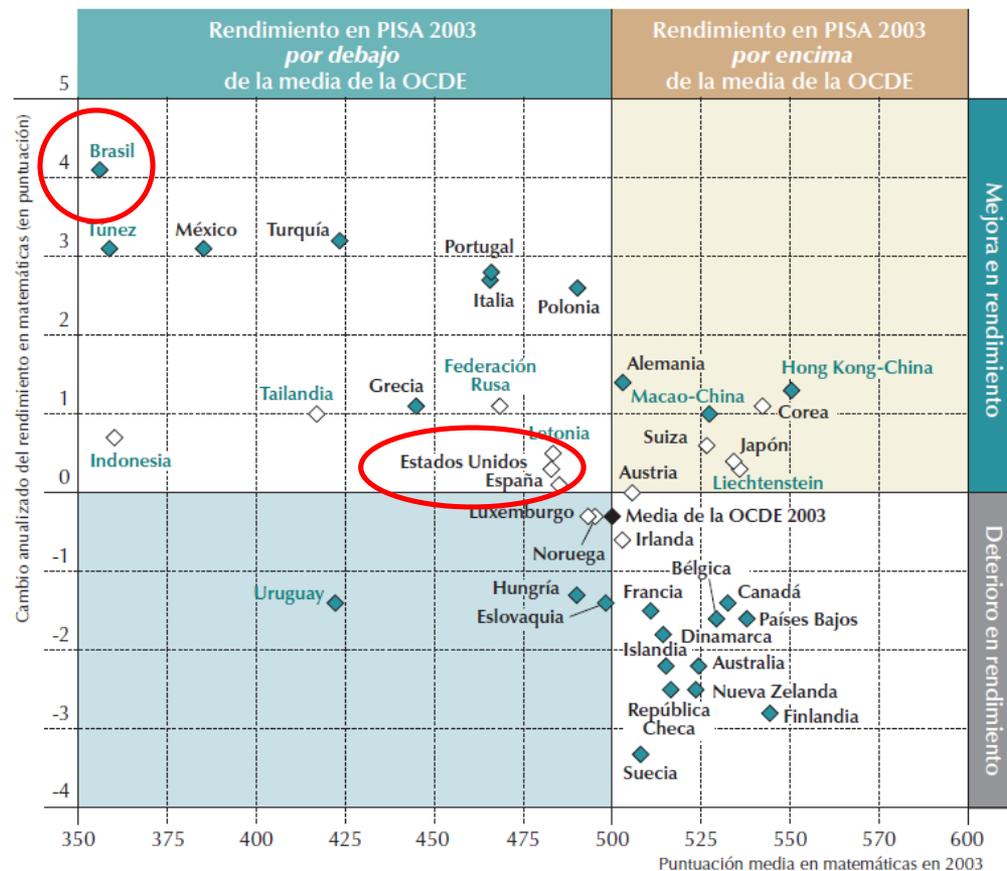


# U.S. High School Graduation Rates



# International Scores and Growth on PISA Mathematics Exam

Cambio anualizado del rendimiento entre 2003 y 2012  
y puntuación media en matemáticas en PISA 2003



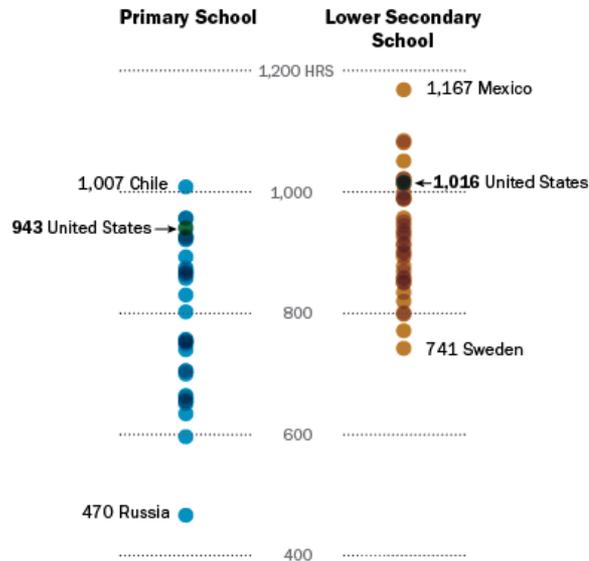
# Extended Learning Time

Is more time always better?

# Total Instructional Time in U.S.

## In Classroom Time, How U.S. Schoolchildren Compare Around the World

Average annual hours of required instructional time



Note: Primary school data for Argentina and lower secondary school data for Turkey not available. Among OECD countries and affiliates. U.S. averages calculated by Pew Research Center based on state-level data compiled by the Education Commission of the States; figures represent the average required instructional time across states for first- and seventh-graders.

Sources: "Education at a Glance: OECD Indicators," OECD; Education Commission of the States.

PEW RESEARCH CENTER / GRAPHIC BY JESSICA SCHILLINGER

- Instructional time is determined by each state in the U.S.
- Most states require between 175 and 180 days of school
- Most states require between 900 and 1,000 hours of instructional time per year
- Students are in school about 7 hours per day.

# Three Common Approaches to Increasing Instructional Time

- Longer School Days
  - Some schools are lengthening the school day
- Longer School Years
  - Some states and schools have substantially increased the school year
- After School Programs
  - Federal law provides funding for students in low-performing schools to attend after-school programs
  - Many schools offer after-school programs which are often not focused on academics

# Mixed Causal Evidence for Extended Learning Time

- Longer School Days
  - Little rigorous causal evidence
  - Highly variable results suggest it is use of time and implementation quality that matter
- Longer School Years
  - Several rigorous quasi-experimental evaluations
  - Additional days of instruction before tests increase student achievement
  - No strong evidence on policy interventions to extend the school year
- After School Programs
  - Several large scale experimental evaluations
  - Negligible to small positive effects with larger effects in programs with an academic focus and evidence-based curricula

# My Read of the Literature

- Increasing instructional time does not automatically increase student achievement. The effect of additional time in school depends entirely on *how* that time is used.

# A Case Study of One Approach to Increasing Instructional Time

## Individualized tutoring

# Match Charter Public High School

- Located in Boston, Massachusetts
- Established in 2001
- 220 student in grade 9-12
- 90% students are African American or Hispanic
- 75% students are from low-income families
- Won multiple awards for student performance



# Extending the School Day for Tutoring in 2004/2005

- MATCH extended the school day by two hours Monday through Thursday
- They used this time to add individual tutoring classes throughout the school day – NOT after school
- This added ~250 hours of individual or small group tutoring for each student
- Tutors were recent college graduates who were hired as full-time staff members
- Tutors worked with the same students over the course of the entire year
- Tutors were well trained and supported
- Tutors coordinated their instruction with classroom teachers

# Quasi-Experimental Research Design

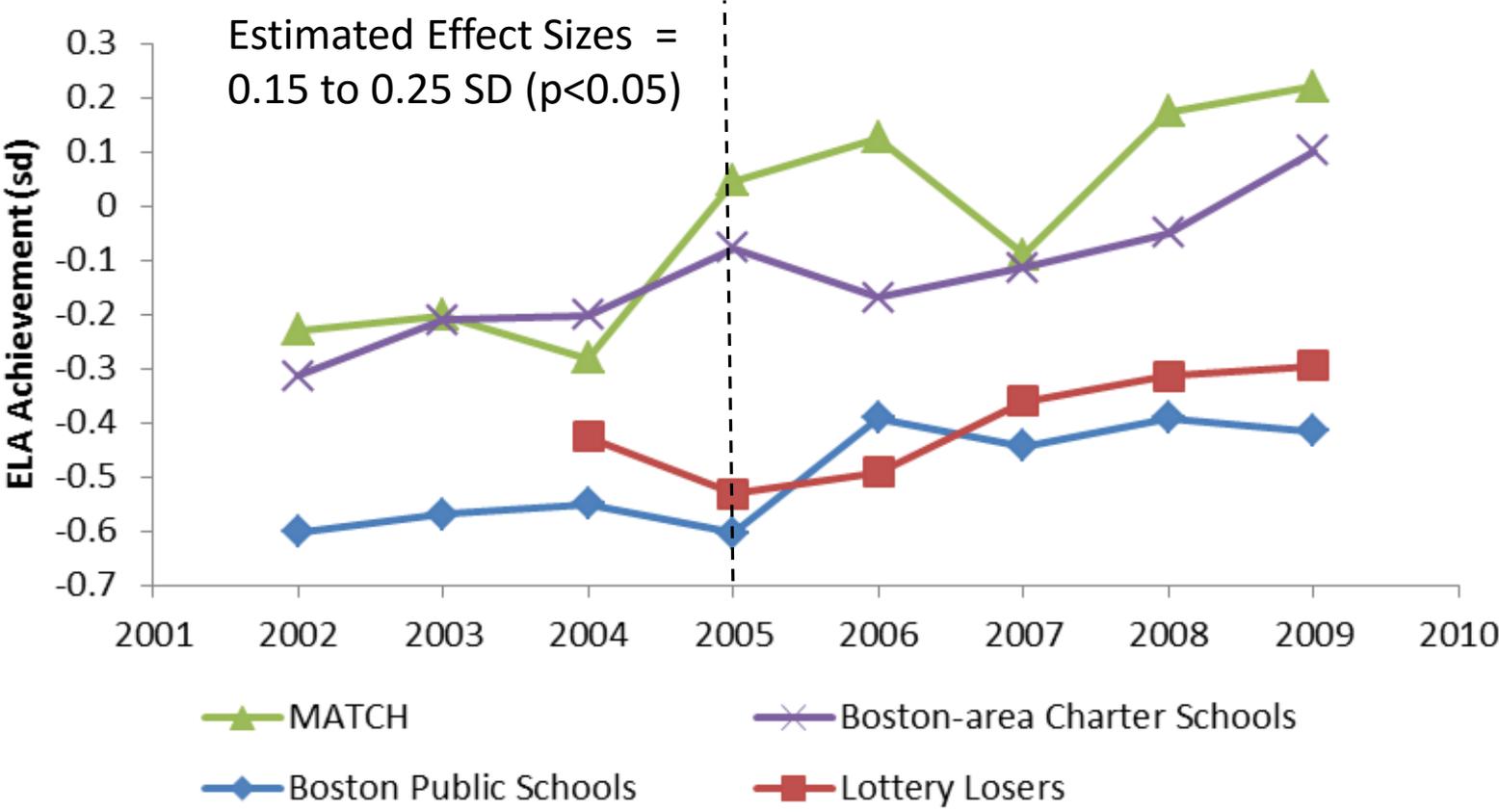
- **Difference-in-Differences**

- Compare changes in student achievement among cohorts of students at MATCH over time relative to changes in achievement among other groups of students
  - Students in other Boston charter schools
  - All students in Boston Public Schools
  - Students who applied to and lost the admissions lottery

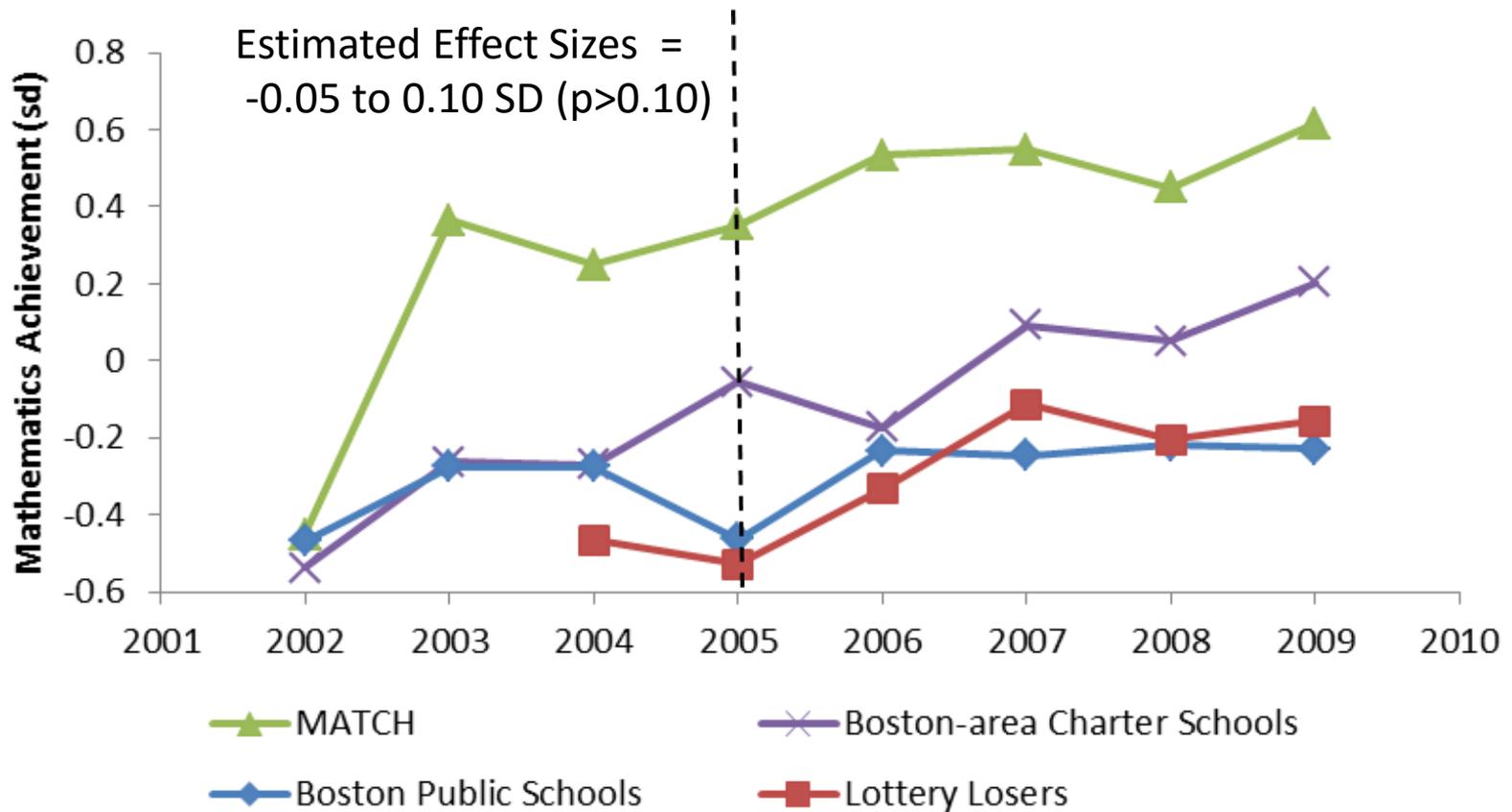
- **Instrumental Variables**

- Students are admitted to MATCH using a randomized lottery
- Use the lottery admission process to estimate the causal impact of attending MATCH in years before and after the extended day for tutoring

# Reading Difference-in-Differences



# Math Difference-in-Differences

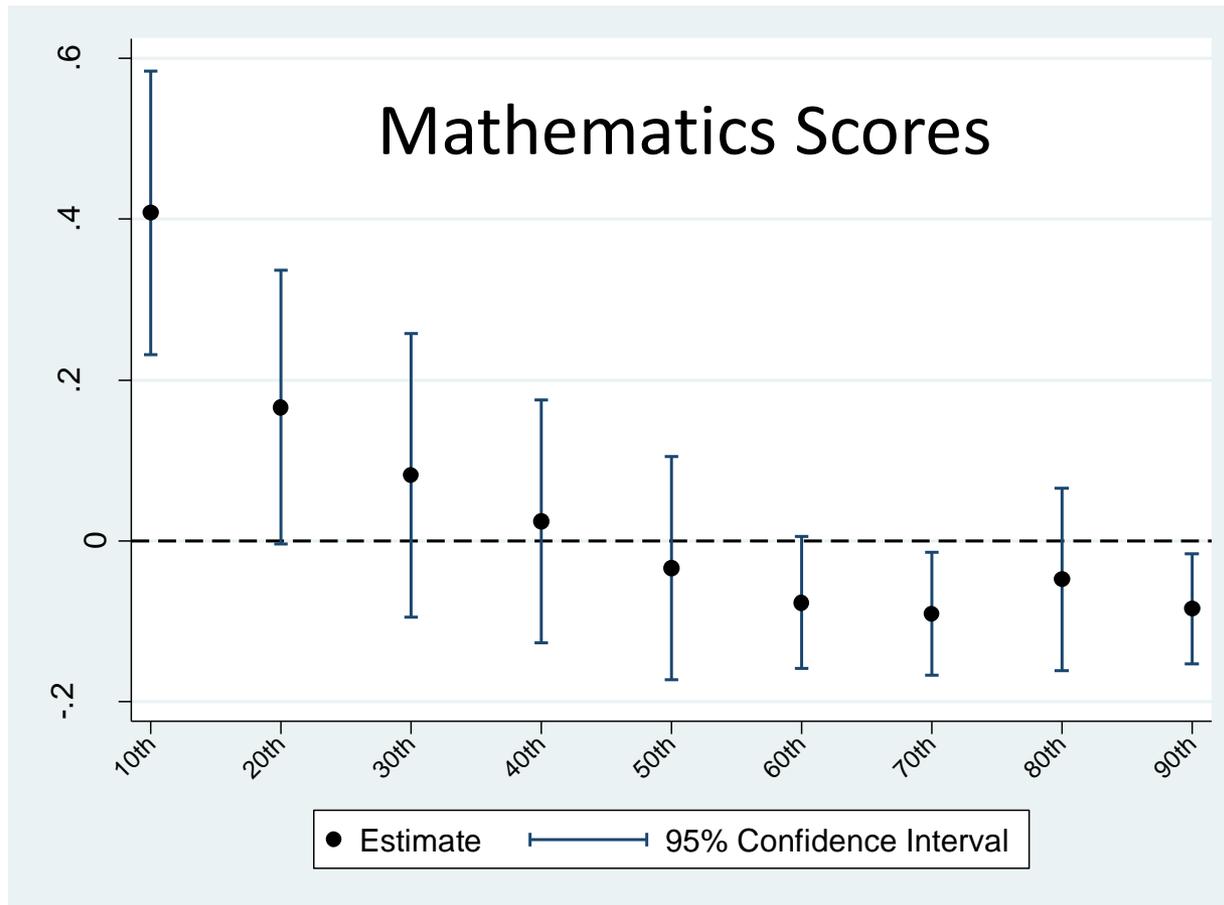


# Instrumental Variable Estimates

	2004-2005		2004-2009	
	(1)	(2)	(3)	(4)
English Language Arts	0.731*	0.701+	0.476+	0.433+
	(0.361)	(0.380)	(0.263)	(0.260)
Mathematics	-0.070	-0.120	-0.105	-0.176
	(0.296)	(0.187)	(0.269)	(0.210)
Observations	540	540	1,998	1,998
8th Grade MCAS Mathematics		Yes		Yes

Notes: + $p < 0.10$ , \* $p < 0.05$ , \*\* $p < 0.01$ . Standard errors clustered at the school-level reported in parentheses. Each cells contains results from separate regressions. All fitted models include indicators for lottery-application cohorts and student demographic controls for sex, race, and age as well as indicators for low-income students, special education students, and students who are non-native English speakers. Estimates that include 8th grade MCAS mathematics scores are estimated using multiple imputation with twenty replication data sets.

# Differential effects among low and high achieving students



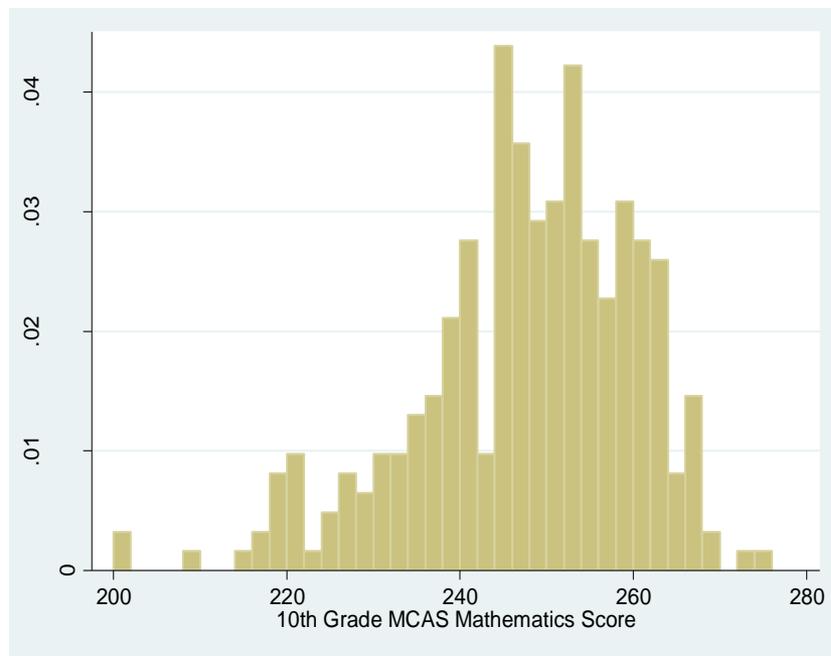
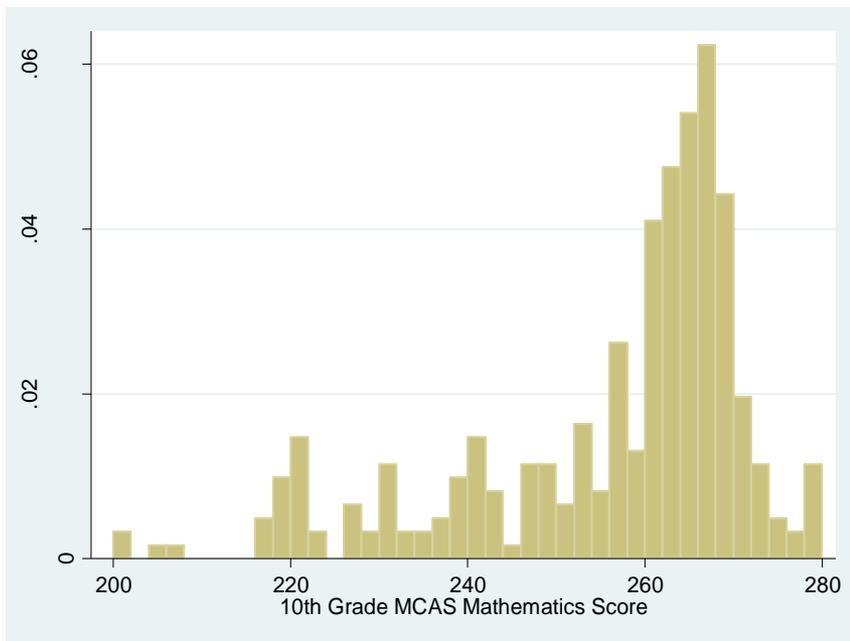
# Differential effects among low and high achieving students



# Possible Ceiling Effects in 10<sup>th</sup> Grade Proficiency Tests

## Mathematics

## Reading



# Summary of Findings

- MATCH extended the school day by 2 hours for individualized tutoring integrated throughout the school day and taught by full-time college graduates.
- Effects on reading achievement of 0.15 to 0.25 standard deviations *per year*. This is large compared to other interventions for high school students in reading.
- No overall effect on math achievement. Some evidence this was due to test score ceiling effects and large pre-intervention math gains.
- Additional time for individualized tutoring benefitted low-achieving students the most.

# New Evidence

- Intensive individualized tutoring programs like MATCH tutors have been shown to raise student achievement at scale.
- Experimental evaluations of school turnaround efforts in Houston (TX) and Denver (CO) indicate that students made the largest gains in the grades and subjects in which tutoring programs were implemented.
- A randomized control trial that combined MATCH tutoring in math with a cognitive behavioral therapy program increased math performance among disadvantaged youth from the South Side of Chicago by approximately two years' worth of learning on standardized tests and over half a letter grade.

# Policy Implications

- Adding more instructional time is not a simple policy solution. Additional time can have positive, null or even negative effects.
- What matters most is *how* additional time is used.
- Integrating individualized tutoring into the school day is one promising use of additional instructional time.
- Key tutoring program details that are likely important for success
  - Tutoring is a class – not an afterschool program
  - Tutors are well-educated
  - Tutors work full-time with the same students over the course of a year
  - Tutors focus on supplementing core academic instruction and coordinate with classroom teachers
- Possible for schools, school districts, states and the federal government to create one-year tutoring fellowships for motivated college graduates who want to serve their countries and work with students

# Thank You!

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