

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

Matthew A. Kraft
Brown University



BROWN

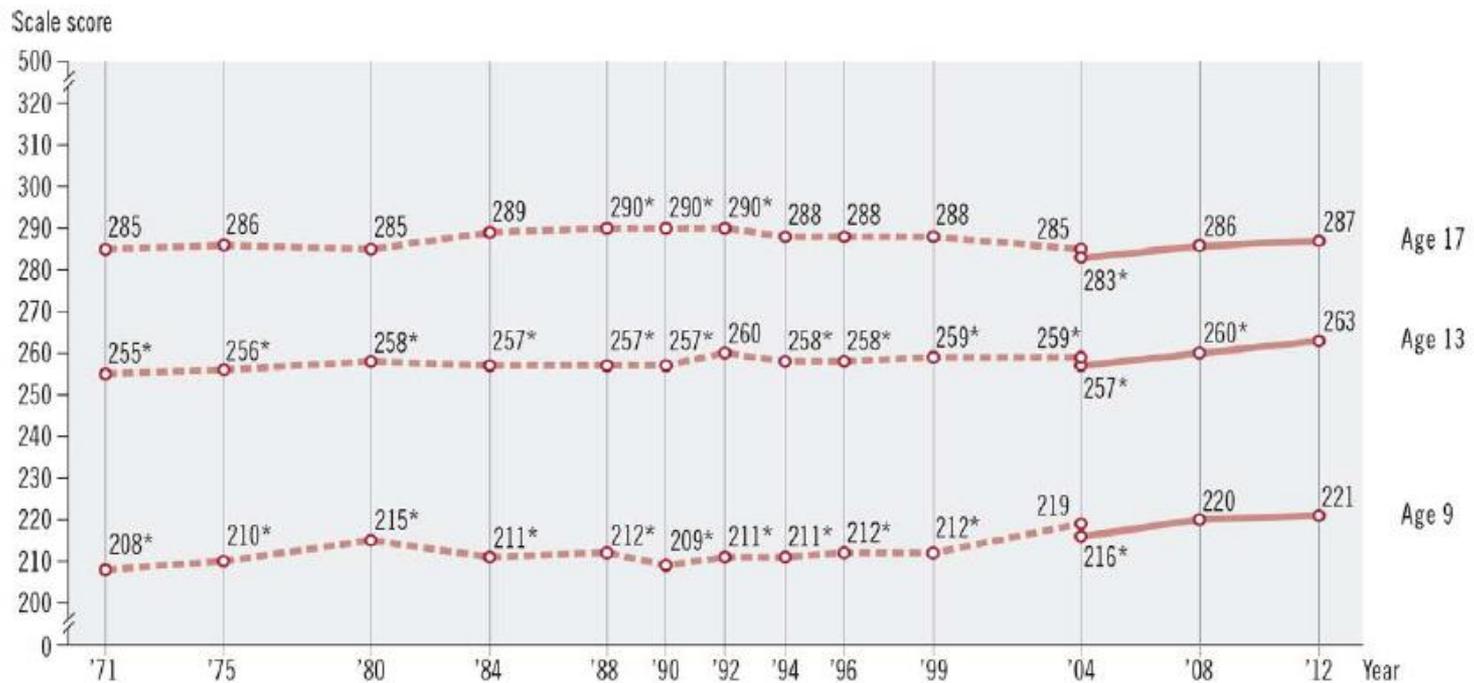
**12th Itaú International Seminar on Economic
Evaluation of Social Projects**

The U.S. Educational Context

Gradual improvement and
persistent challenges

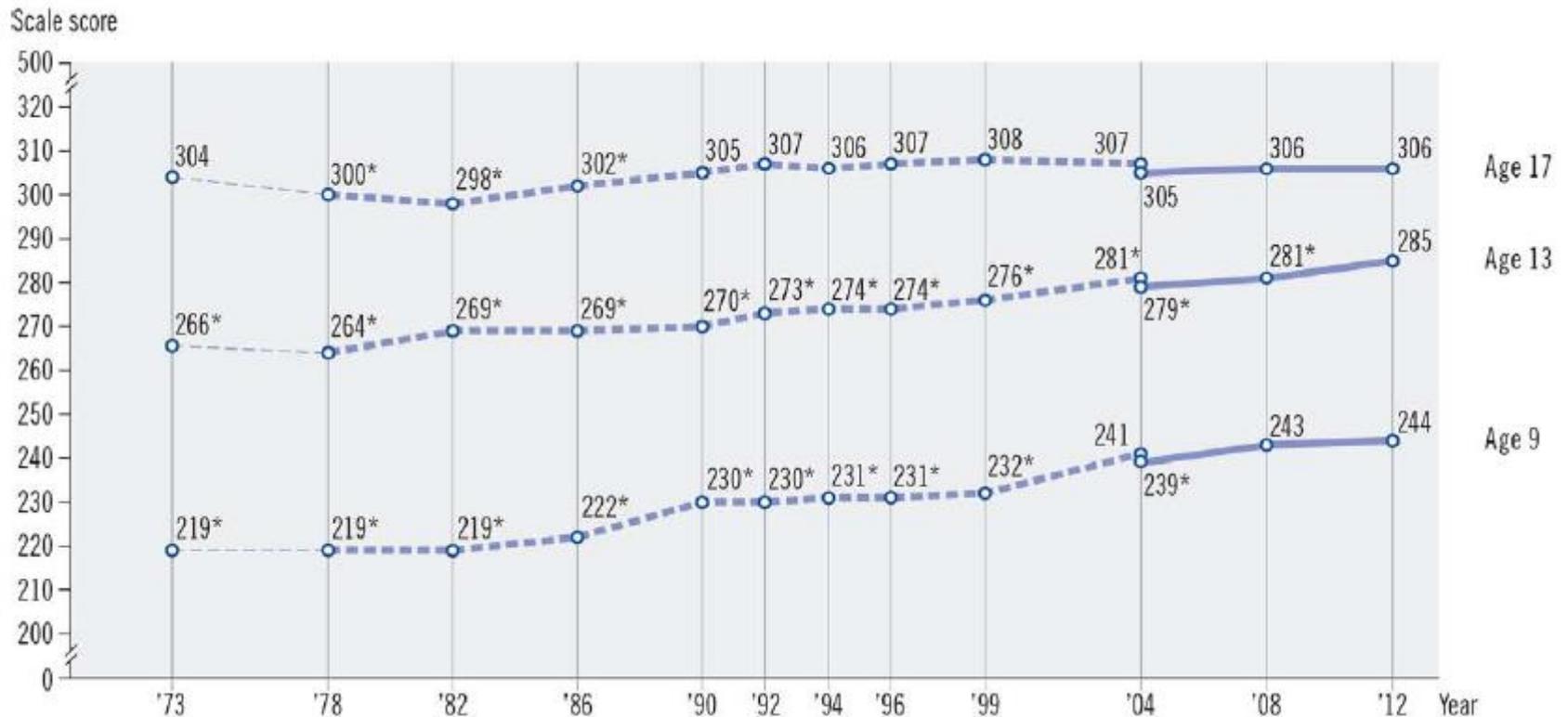
Trends in Reading Scores

National Assessment of Educational Progress



Trends in Mathematics Scores

National Assessment of Educational Progress

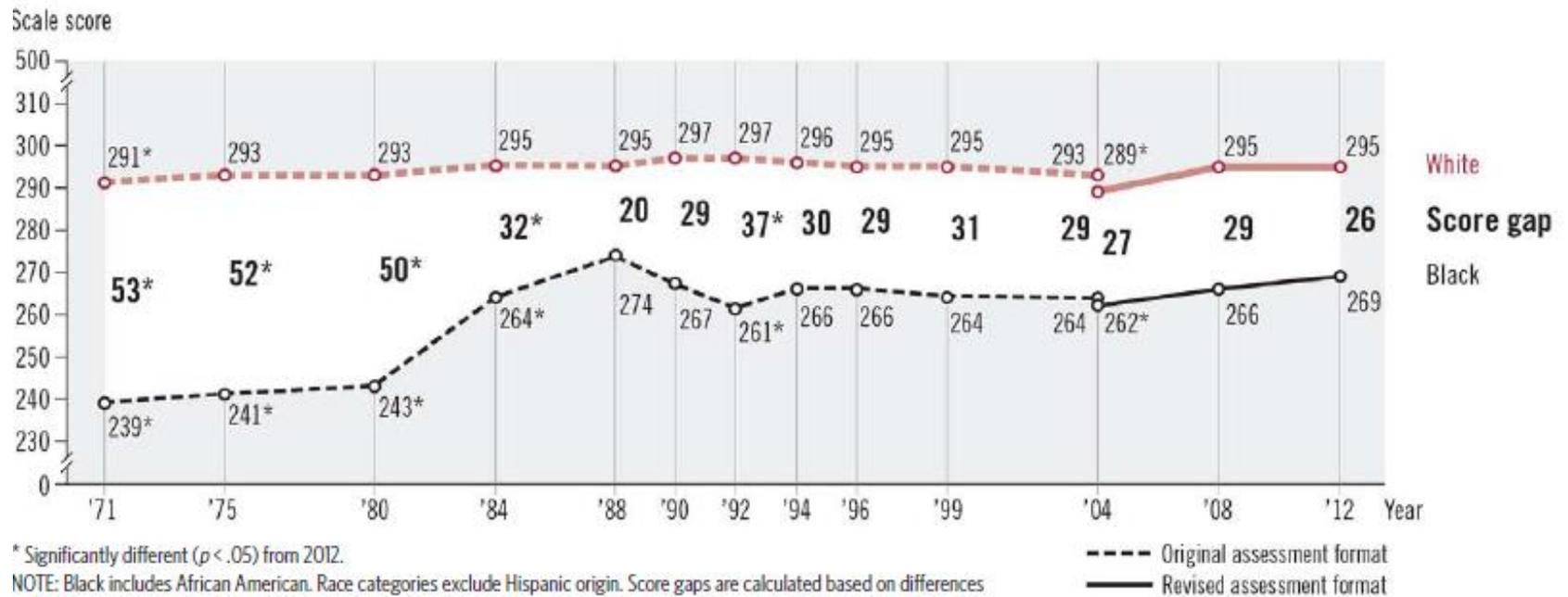


* Significantly different ($p < .05$) from 2012

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)

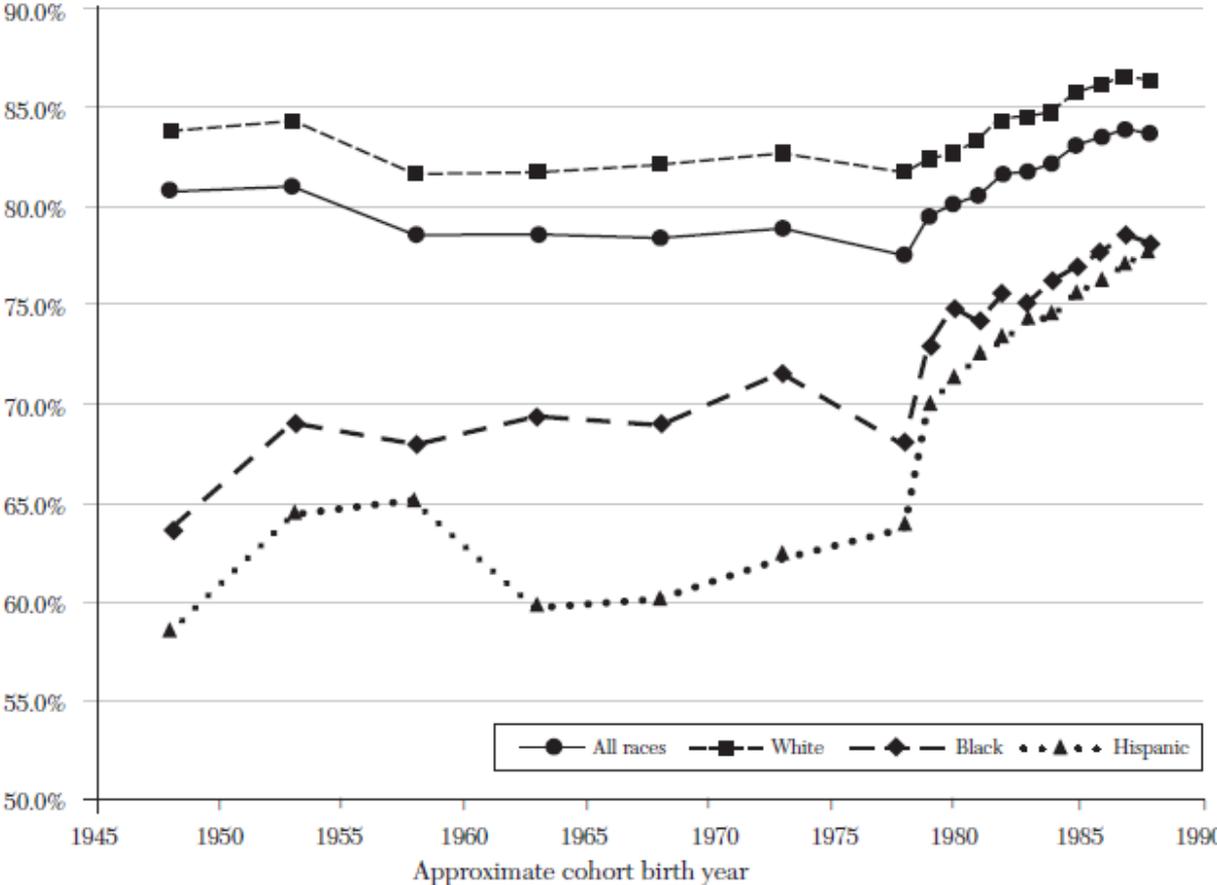


The Black-White Achievement Gap

Mathematics Scores (17-year olds)

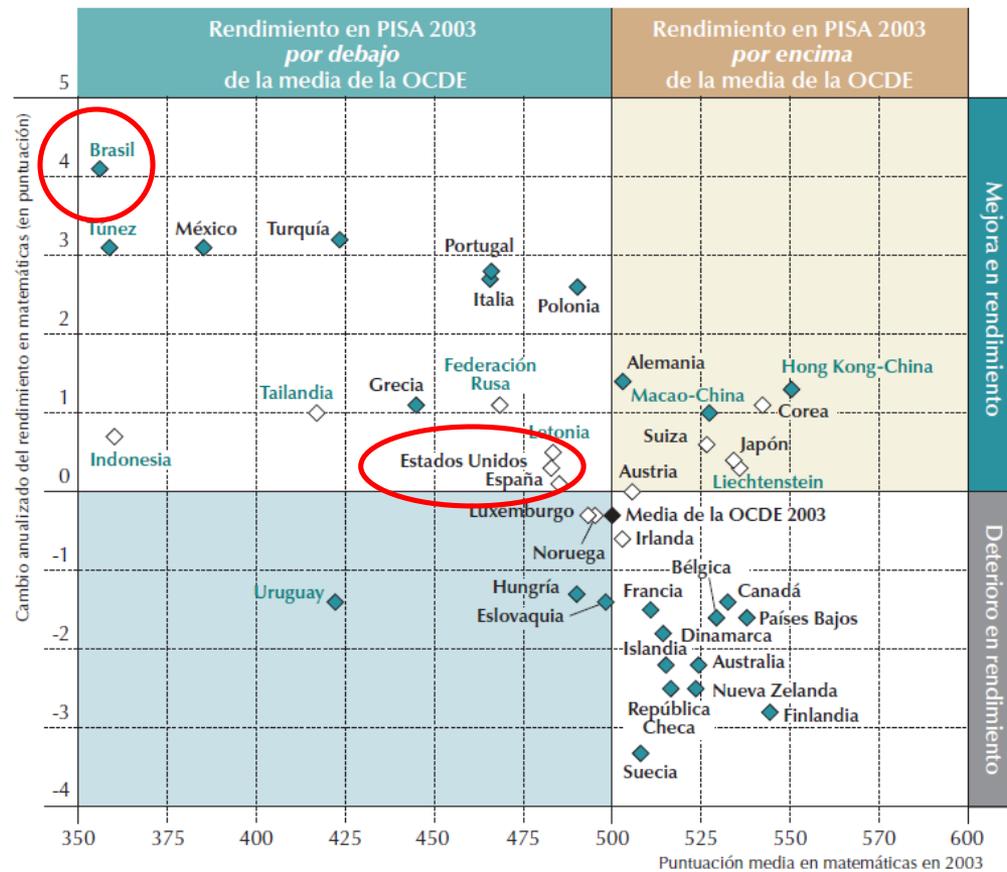


U.S. High School Graduation Rates



International Scores and Growth on PISA Mathematics Exam

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



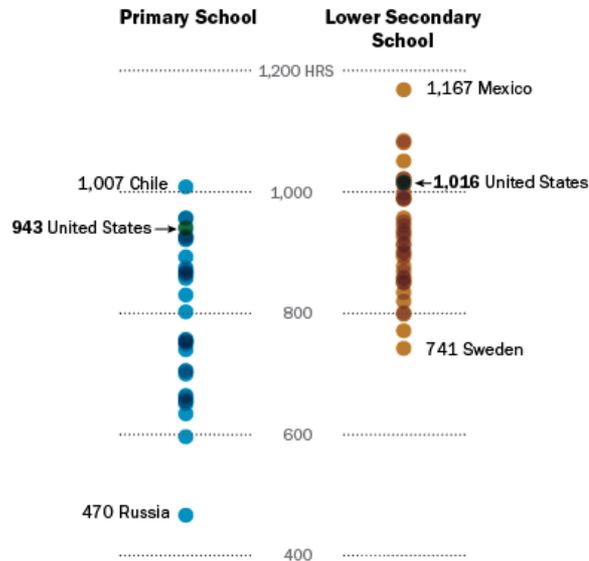
Extended Learning Time

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

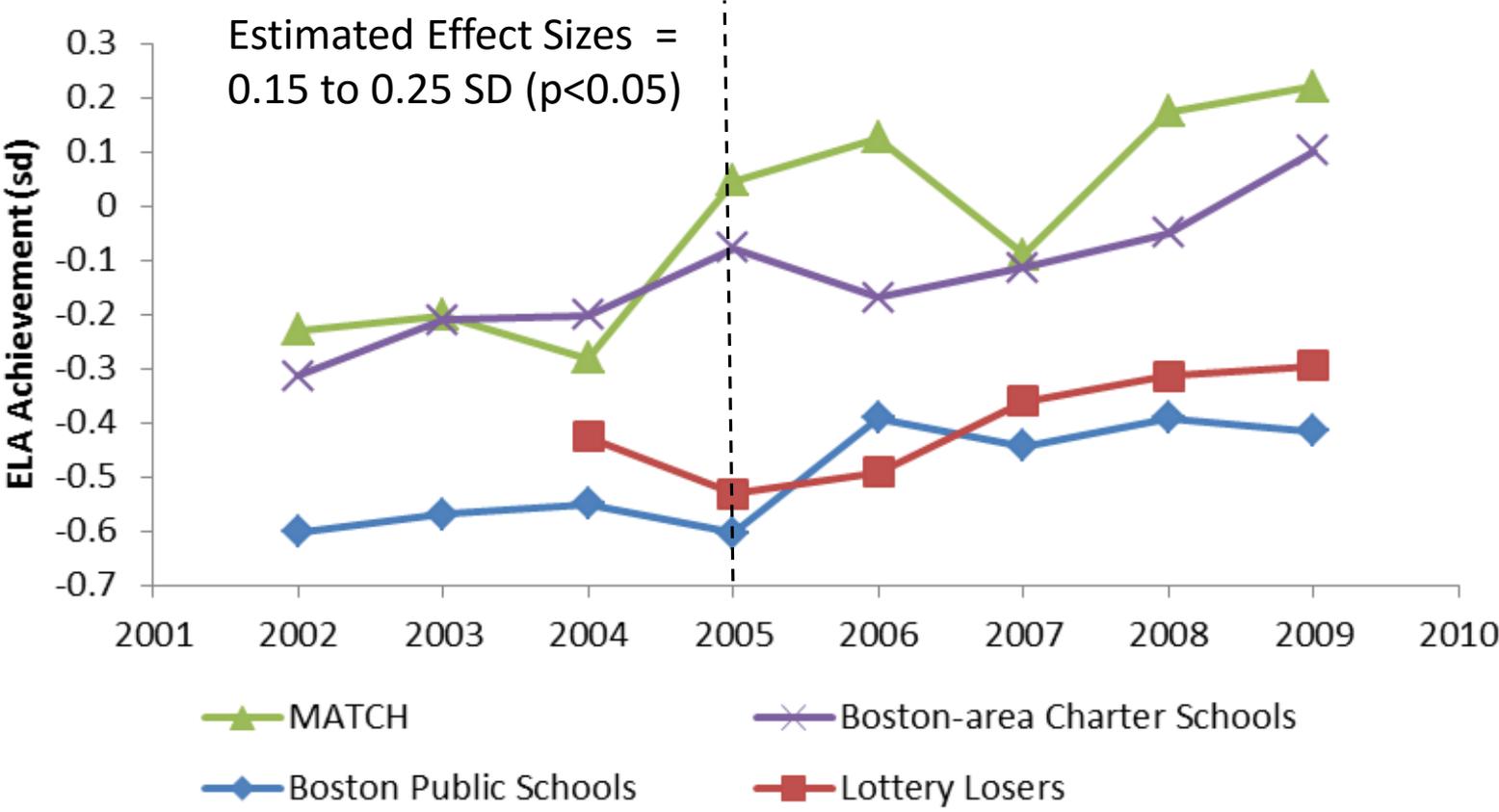
- **Difference-in-Differences**

- 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

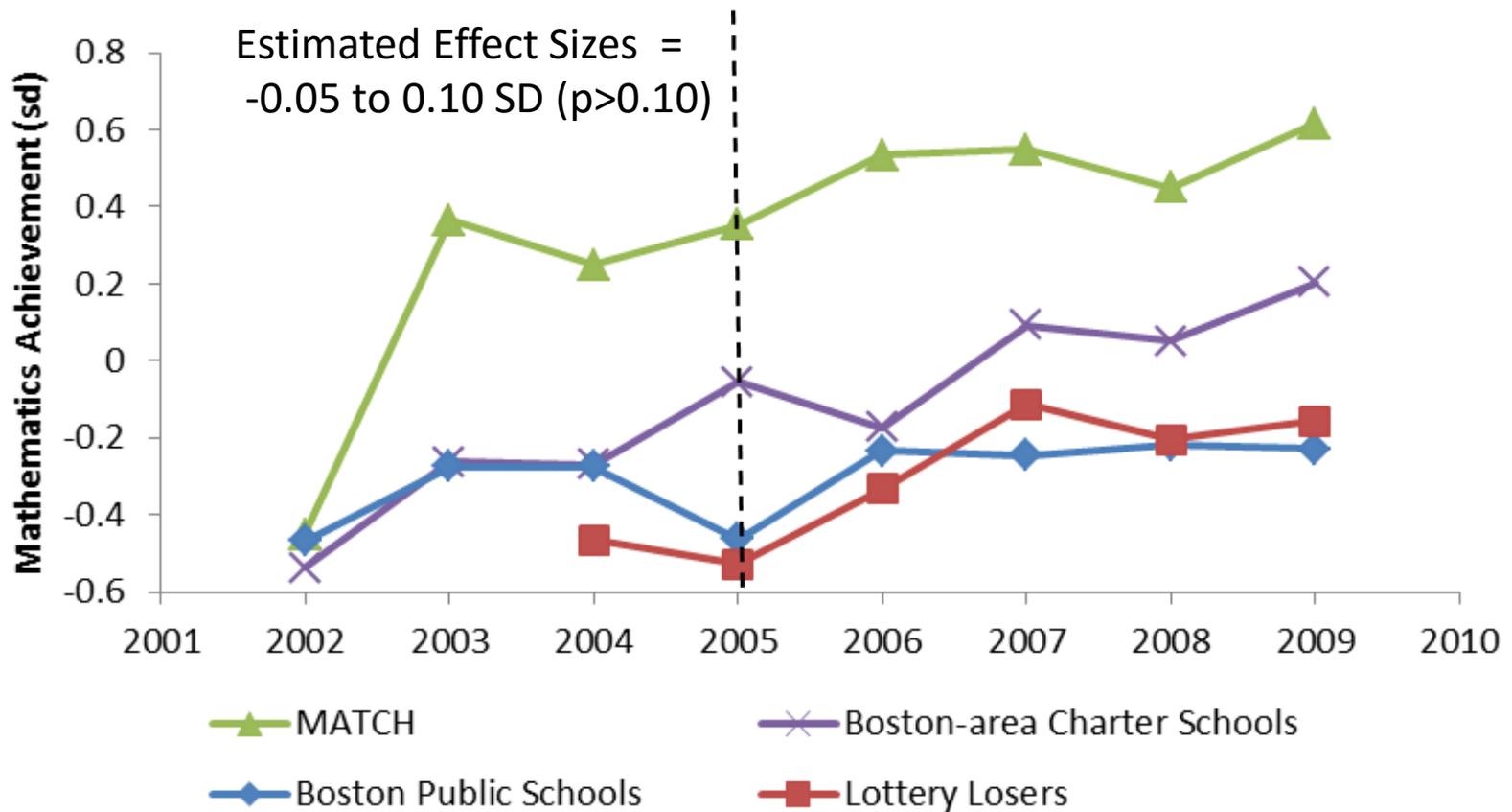
- **Instrumental Variables**

- 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

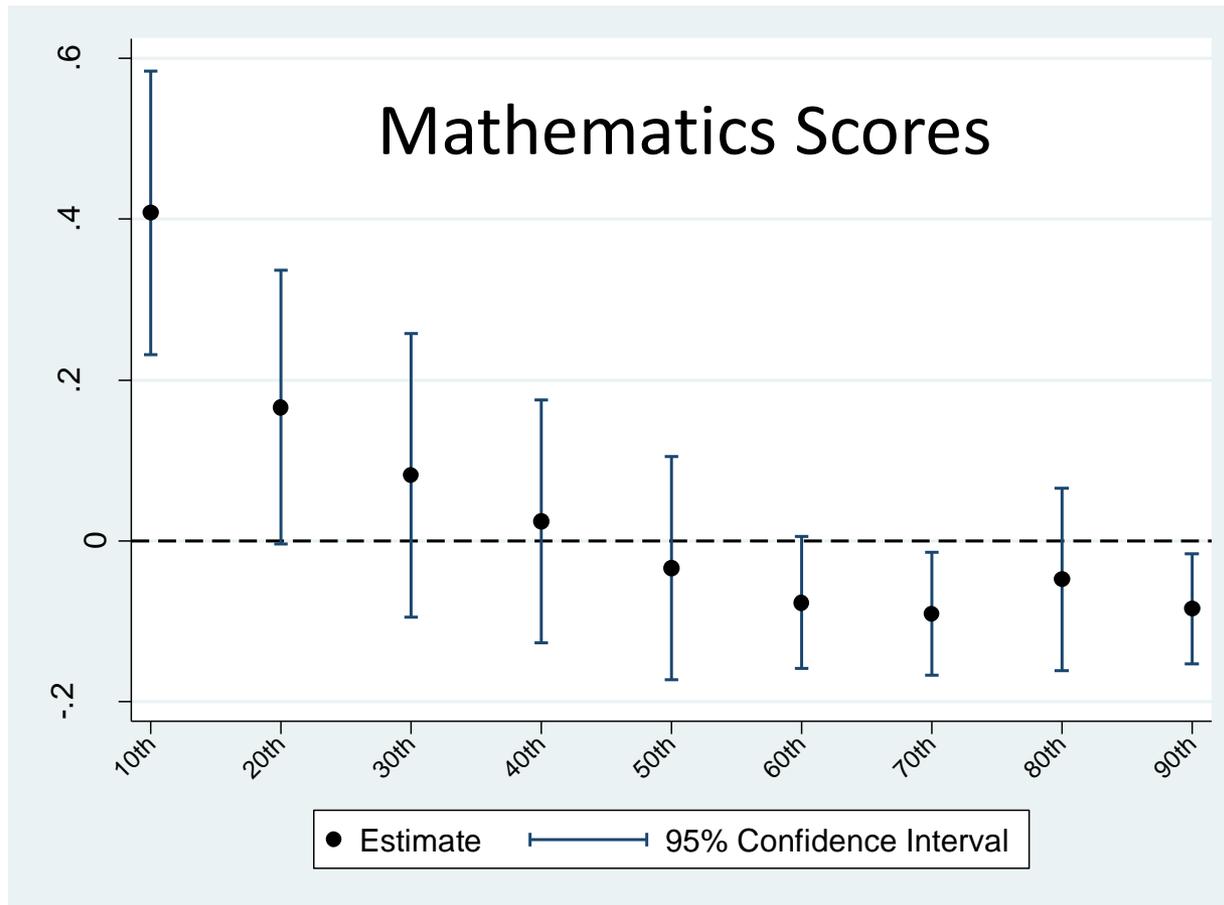


Instrumental Variable Estimates

	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



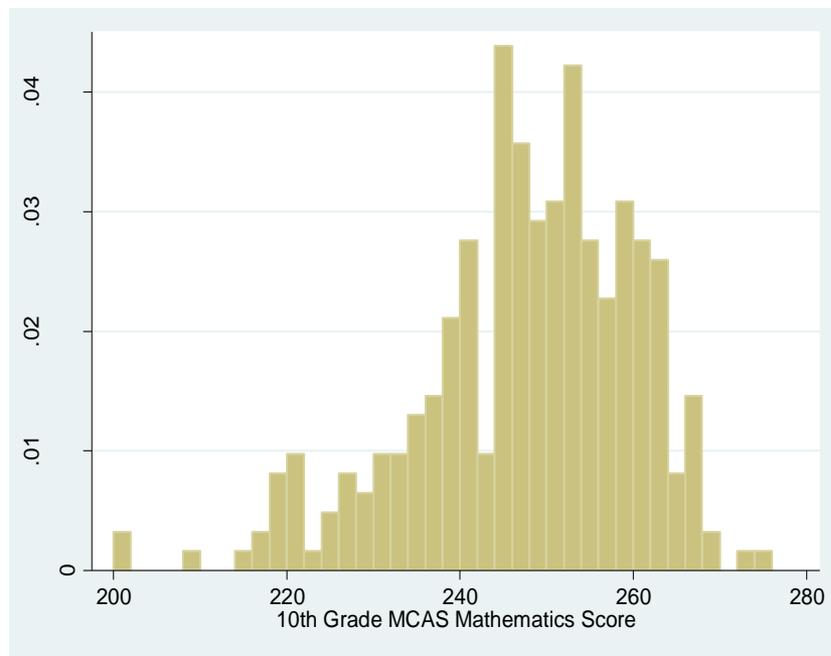
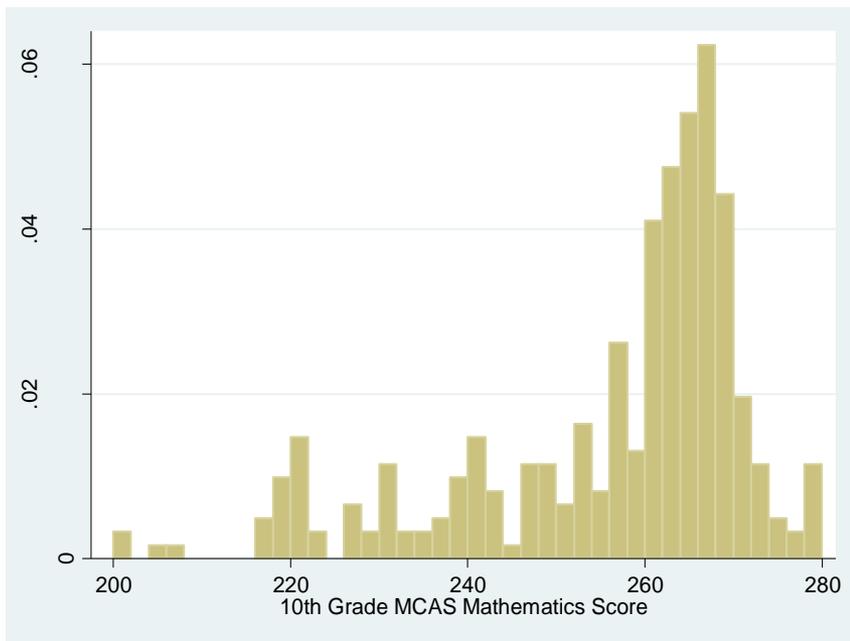
Differential effects among low and high achieving students



Possible Ceiling Effects in 10th 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!

Matthew A. Kraft
Brown University

mkraft@brown.edu

@MatthewAKraft

www.matthewakraft.com