Who benefits from gifted education? Lessons from economic research

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Economic research on gifted shows varied findings

- Early studies: participating in gifted education has **little/no impact on test scores** …
  - Card & Giuliano 2014; Card, Giuliano & Chyn 2026 – (Florida, grades 3-12)
  - Bui, Craig and Imberman 2014 – (state in southwest US, middle school)
  - Chin & Kocks 2025, WP – (New York City, K-8)

Common reactions from gifted teachers:

- Gifted programs are *not supposed* to boost test scores!
- The great thing about teaching in gifted students is freedom from the pressure to raise test scores.

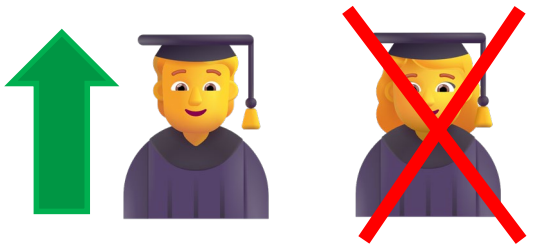
You can *escape the "drill and kill"* !



Economic research on gifted shows varied findings

- Early studies: participating in gifted education has **little/no impact on test scores** …
- But it **raises college entry** of **disadvantaged boys (not girls)**
  - Card, Giuliano & Chyn 2026 (Florida, grades 3-12)
  - Carlana, Ferrara & Pinotti 2022 (Italy, middle school)

    Tutoring/counseling for high-ability children **raised academic-track HS school choice** of **immigrant boys** (not girls)



Economic research on gifted shows varied findings

- Early studies: participating in gifted education has **little/no impact on test scores** …
- But it **raises college entry** of **disadvantaged boys (not girls)**
- Tracking non-gifted, high-achieving students into "gifted/high achiever" classrooms **raises test scores** for **Black and Hispanic (but not white)** high achievers
  - Card, Giuliano & Chyn 2016 (Florida, grades 4-5; top 10-20% *within school*)
  - Cohodes 2020: accelerated classrooms (Boston, grades 4-6; top 10-20% *city-wide*) **raises high school graduation & college entry** (but **not test scores**) for **Black & Hispanic** students

What to make of this evidence?

The benefits of gifted education and related programs seem to depend on:

- The outcomes used to measure benefits
- The goals & features of the program
- The characteristics of the students & how they were selected to participate



But are there some systematic patterns?

A simple framework

Suppose a student outcome of interest requires a mix of "inputs."
E.g., graduating from high school and going to college requires:

- Ability ("cognitive skill")
- Motivation (→ effort)
  ("noncognitive skill")

*"Genius is one percent **inspiration** and ninety-nine percent **perspiration**"*
– Thomas Edison



A student's outcome is impacted by program participation if they:

1) Possess pre-requisite inputs that are not affected by the program
   → they have "potential"
2) <u>Lack</u> inputs that are boosted by the program
   → they have "room for improvement" – need help to fulfill potential

❖ Important to consider what is *missing* in the *counterfactual* setting

All of these children may thrive in a gifted program …







… but their counterfactuals may differ!





Varied results can be understood via this framework

1. Gifted participation increases college enrollment of high-IQ, disadvantaged boys (but not girls) (Card, Giuliano & Chyn 2026)
2. Test-score based placement in 4th-grade gifted/high-achiever classroom increases test scores for non-gifted Black & Hispanic (but not White) students (Card & Giuliano 2016)
3. Middle school math acceleration for students in top 20% of math scores: impacts vary by gender and non-cognitive skills (Card & Giuliano 2026 WP)

Setting: Large urban school district in Florida

- One of largest in U.S.: 20K students per grade
- Racially diverse: ~ equal shares of Hispanic, Black, White
- Economically diverse: ~ half eligible for free/reduced price lunch (FRL)
- Innovations for identifying and serving disadvantaged students:
  - lower IQ threshold (≥116) for FRL & ELL
  - universal gifted screening, grade 2

  ensures large numbers of disadvantaged gifted students

  - **gifted/high achiever (GHA) classrooms, grades 4-5 (local norms)**

    → in every school with ≥1 gifted child

    → many disadvantaged, non-gifted, high-achieving students

1. Gifted status increased college enrollment of disadvantaged boys (but not girls)

Card, Giuliano & Chyn (*Journal of Political Economy*, forthcoming)

Features of gifted education program

Gifted identification:

- Universal screening: all 2nd graders take non-verbal ability test in class
  - High scorers automatically referred for full IQ test
- IQ tests & gifted placement in grades 2-5
  - Once identified, gifted status is permanent (through 12th grade)
- Gifted status requires **IQ ≥ 130** or **if disadvantaged, IQ ≥ 116**
- Additional criteria assessed by meeting with teachers/parents/specialist
  - Intentionally flexible → do not to exclude "underachievers" with high potential

Features of gifted education program

Gifted services:

- **Education Plan (EP)** updated bi-annually in consultation with teachers, parents & gifted education specialist.
  - Exclusive to gifted children; sets curricular goals / enrichment guidelines
- Separate, full-time "gifted/high achiever" classrooms in grades (3) 4-5
- Accelerated math program starting in grade 6
  - all students above ~80th percentile on 5th-grade math test are eligible
  - gifted students may be privileged if open seats
- Most schools have gifted/high achiever classes in other subjects (grades 6-8)

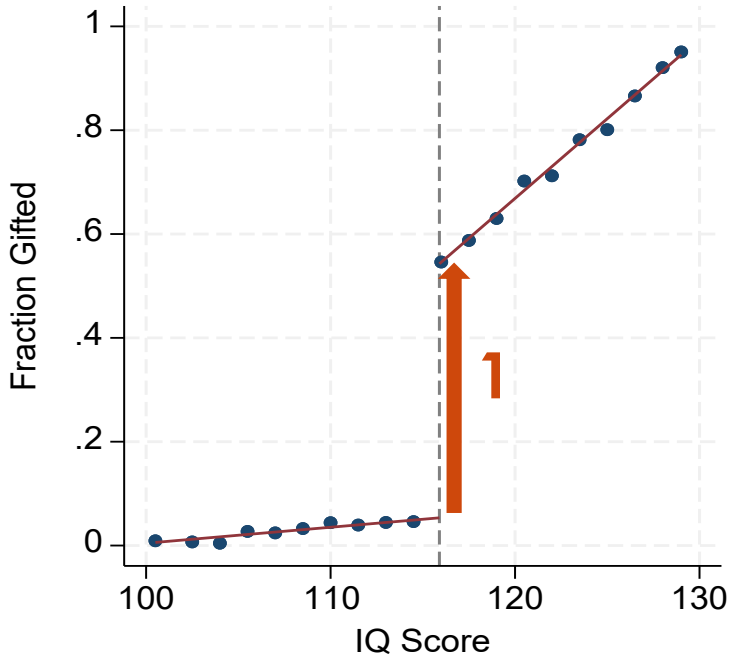
Causal Inference

How do we know if differences between gifted & non-gifted are *caused* by participation in gifted program (***causation***) …

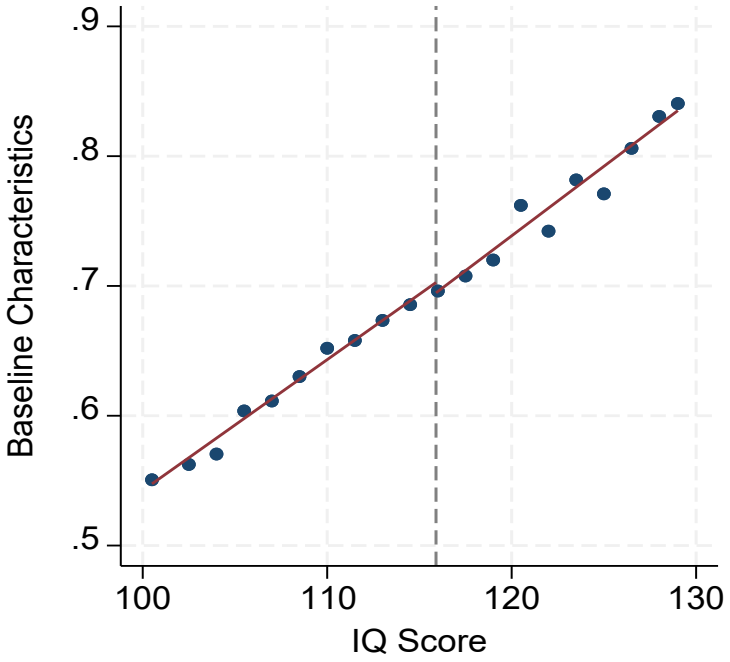
… and ***not*** by other differences between gifted & non-gifted children (***correlation***)

?

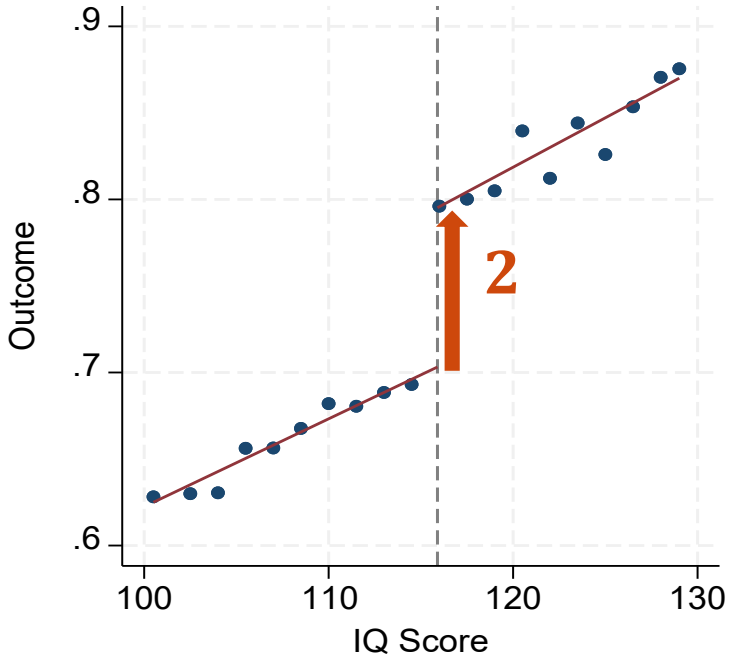
"Regression Discontinuity" Design based on IQ threshold



Discontinuous jump in **fraction gifted** (1)

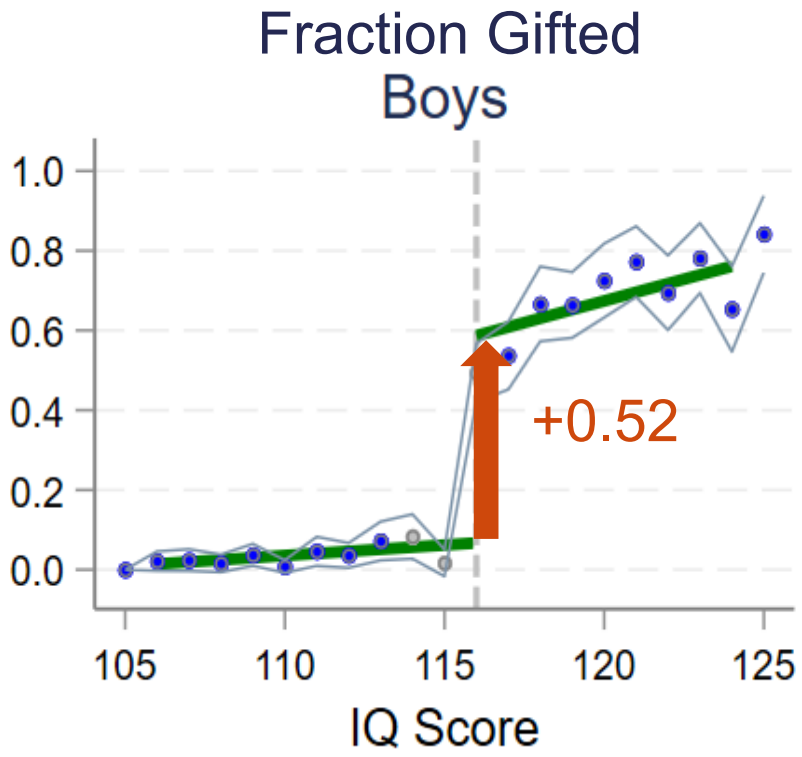


Other student characteristics do not jump

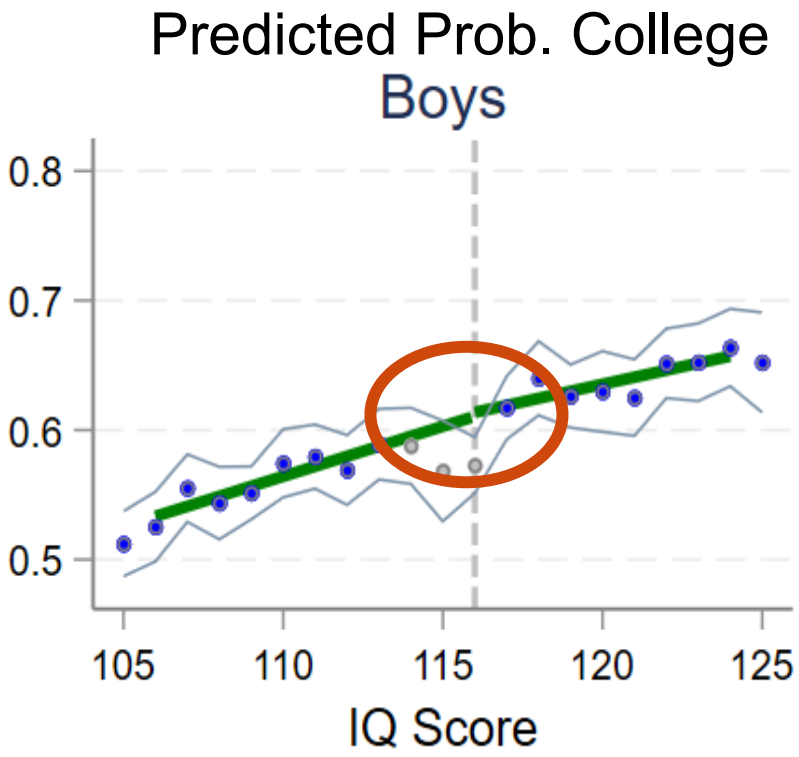


Discontinuity in **outcome** (2) must be caused by jump in gifted status (1)

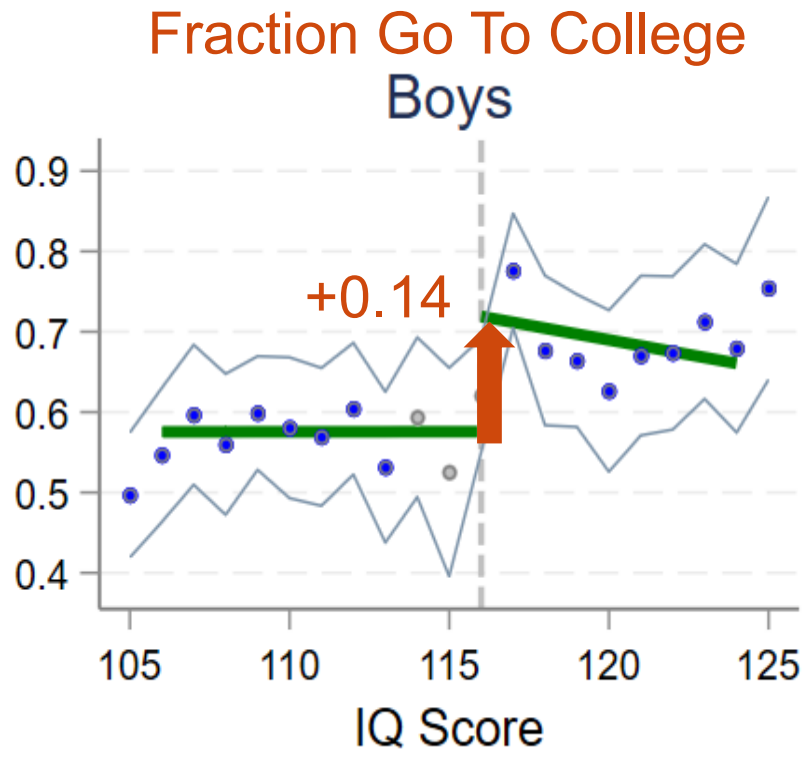
Regression Discontinuity Results for **Boys**



52 pct point increase in share of students who participate in gifted program

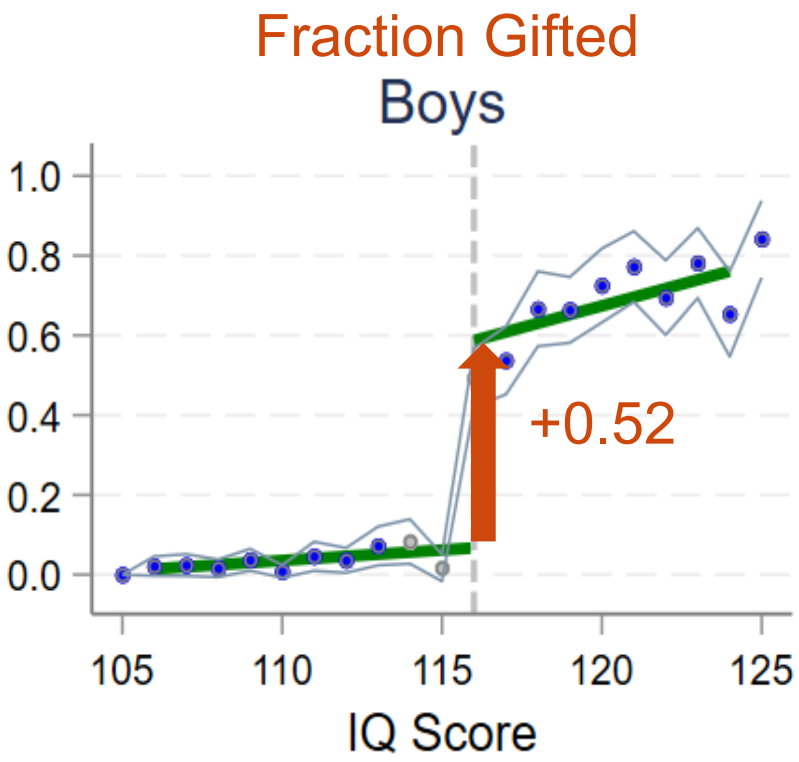


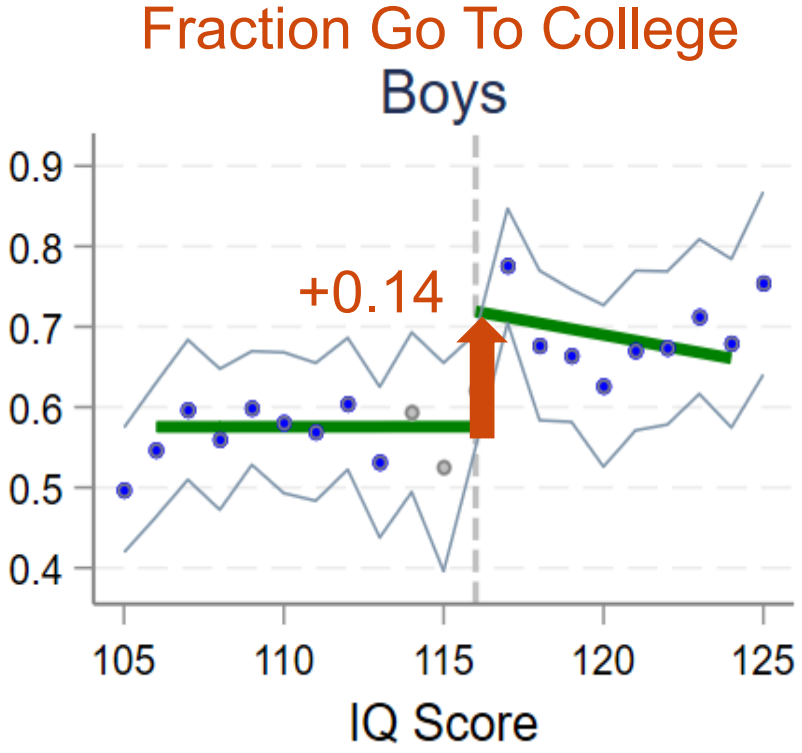
No change in average student characteristics that are *correlated with* going to college (e.g., baseline test scores)



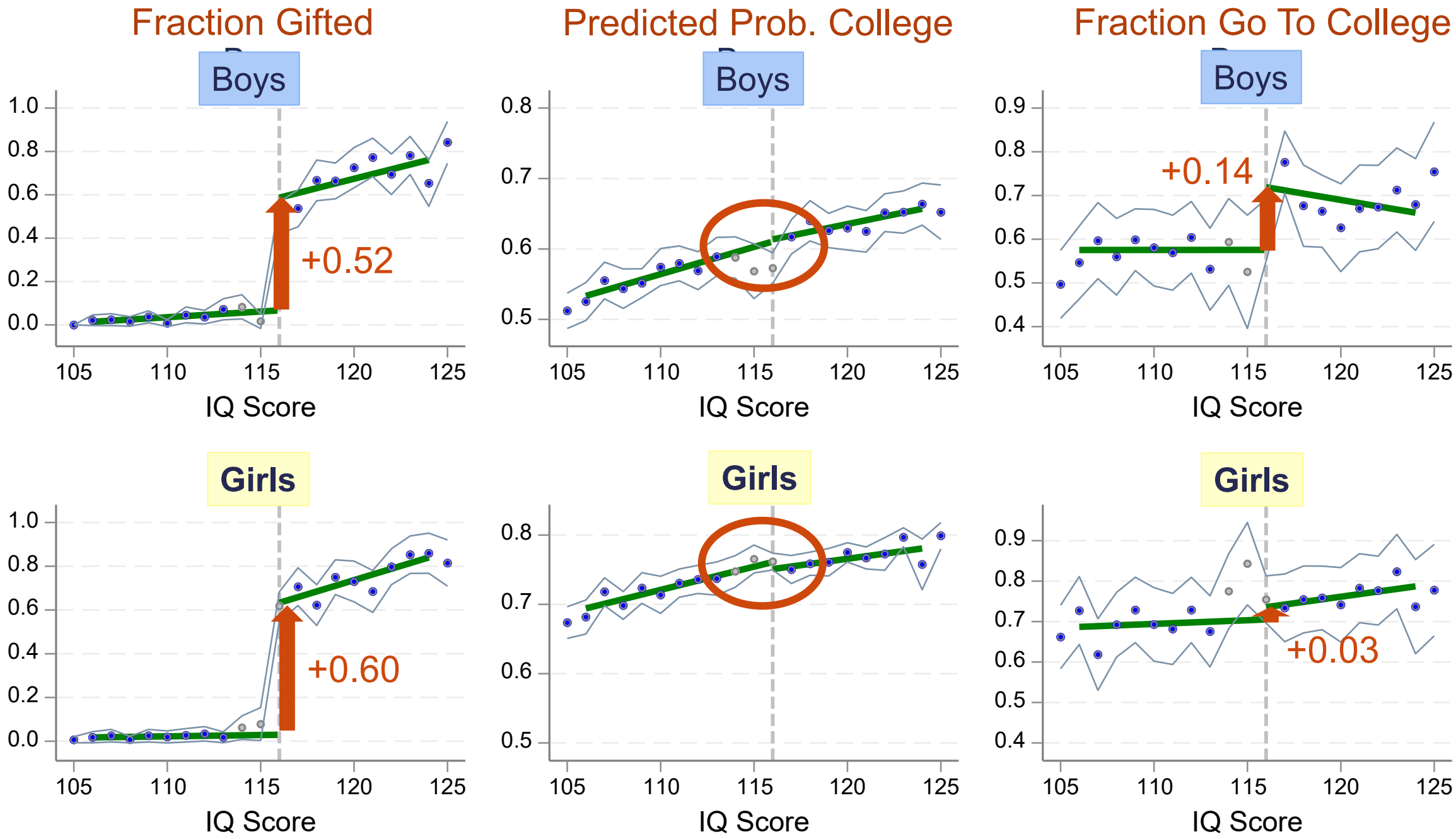
14 pct point increase in share of students who graduate HS on time and enter college

Regression Discontinuity Results for **Boys**

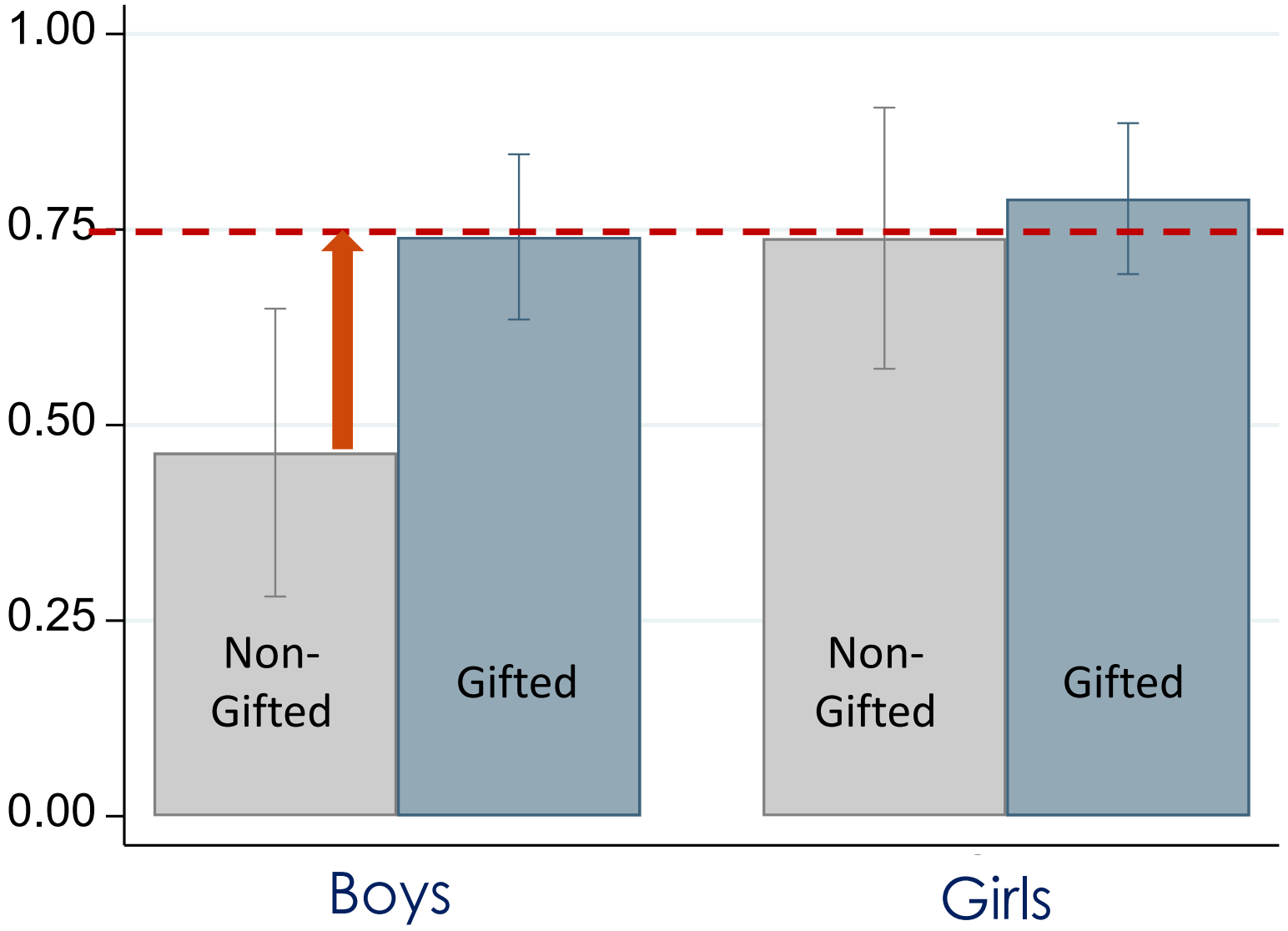




$\Rightarrow$ $.14 / .52 \approx 27$ **pct point increase** in college entry per gifted student


Fraction Gifted
Boys
1.0
0.8
0.6
0.4
0.2
0.0
+0.52
105
110
115
120
125
IQ Score
Predicted Prob. College
Boys
0.8
0.7
0.6
0.5
105
110
115
120
125
IQ Score
Fraction Go To College
Boys
0.9
0.8
0.7
0.6
0.5
0.4
+0.14
105
110
115
120
125
IQ Score
Girls
1.0
0.8
0.6
0.4
0.2
0.0
+0.60
105
110
115
120
125
IQ Score
Girls
0.8
0.7
0.6
0.5
105
110
115
120
125
IQ Score
Girls
0.9
0.8
0.7
0.6
0.5
0.4
+0.03
105
110
115
120
125
IQ Score

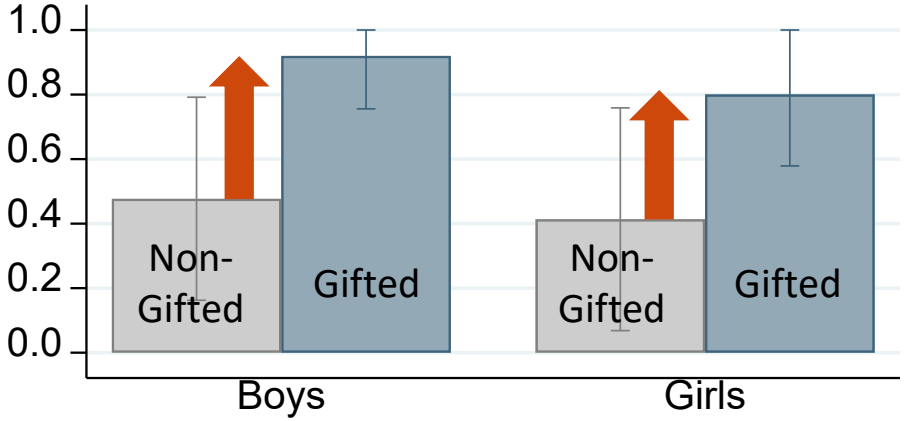
College Entry: Gifted vs. Non-Gifted; Boys vs. Girls



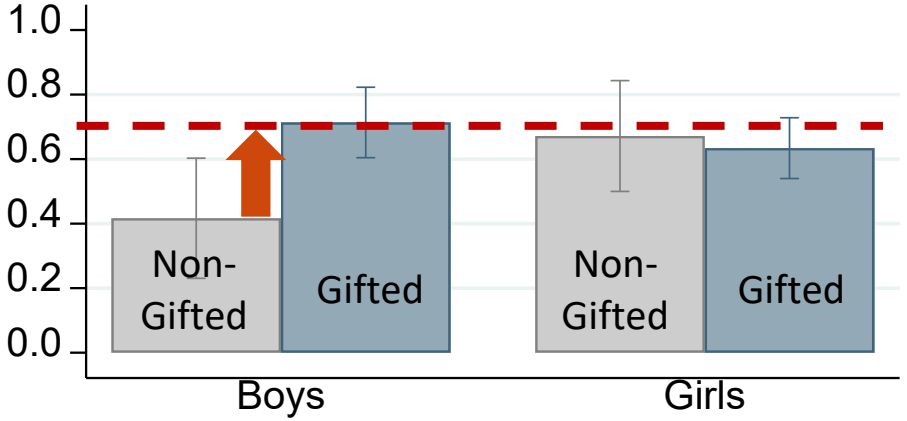
Gifted status causes boys to "catch up" to girls with same IQ

Intermediate outcomes show similar patterns

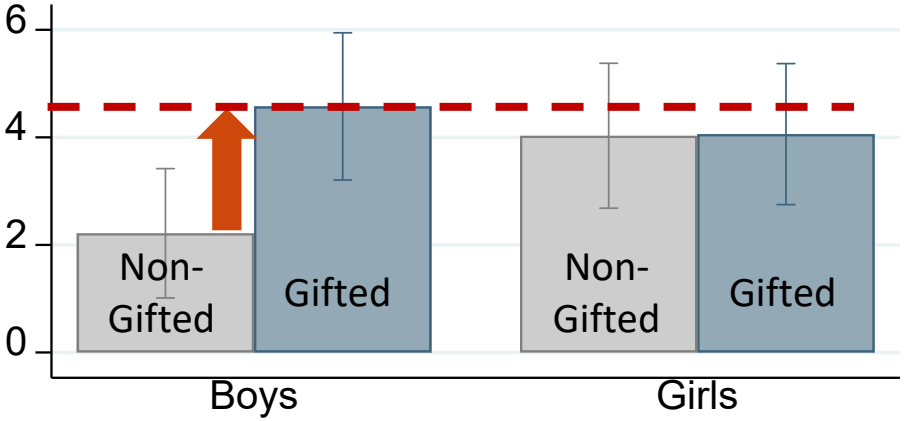
Staff helped select challenging courses



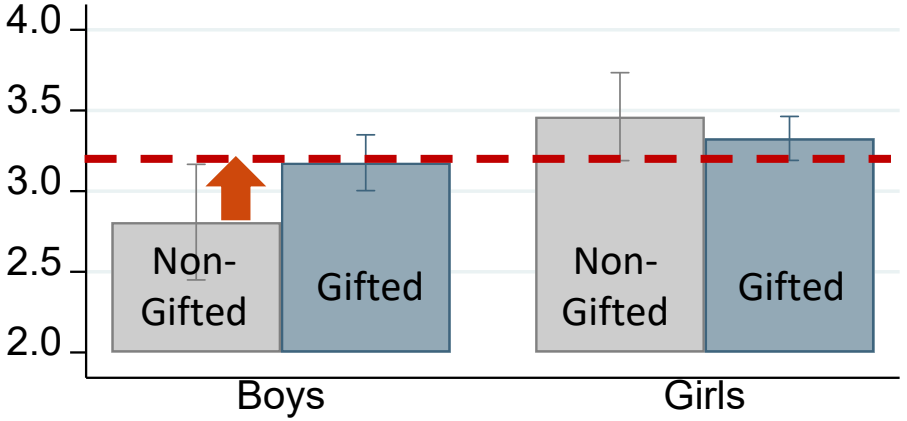
Took algebra before high school



Advanced Placement courses

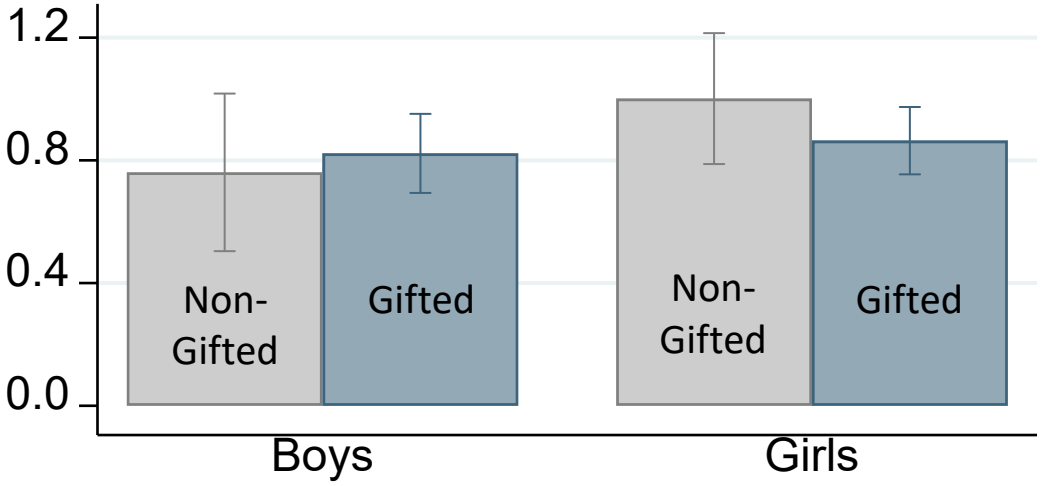


GPA in HS math courses

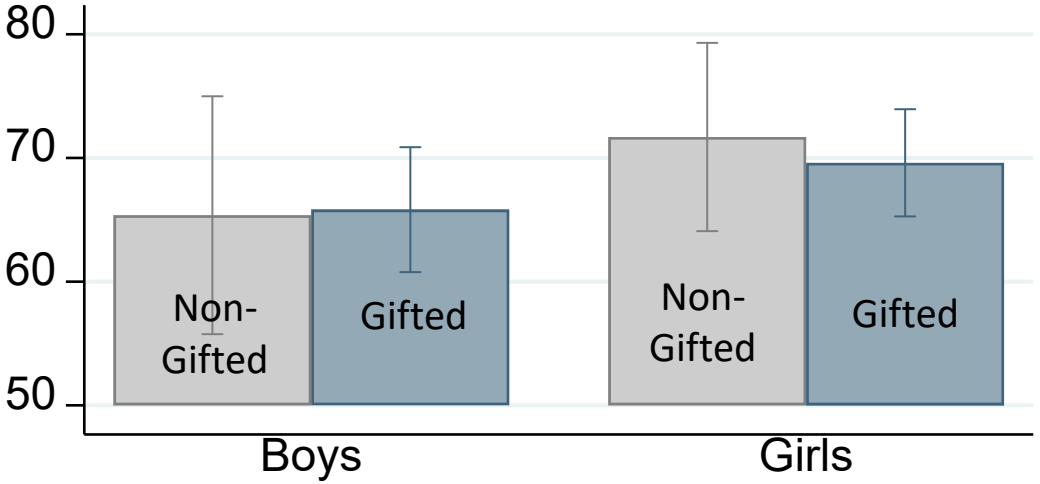


But no effect on test scores!

Standardized test scores, grades 6-8 (reading & math combined)



PSAT percentile score, 10th grade (reading & math combined)



Why the gender differences in impact?

- Both girls and boys have high ability ($IQ \geq 116$)
- When in the gifted program, girls and boys have similarly strong outcomes
- When ***not*** in a gifted program, boys have ***worse*** outcomes

→ *Question*: what input (in addition to ability) is:

- important for good grades, challenging classes & enrolling in college
- lacking for many boys, but present for girls, in the counterfactual setting
- plausibly increased by gifted program participation?

Hint ....





Is it "non-cognitive" skills?

- Differences in course grades between students with similar IQ or tests scores have been attributed to **"non-cognitive" skills** – e.g., motivation, engagement, persistence (Heckman et al., 2006 ; Borghans et al., 2016)
- Gender gaps in non-cog measures predict gender gaps in grades (Cornwell, Mustard & Van Parys 2013) and in college enrollment (Jacob 2002)
- Teachers who help students get good grades improve boys' outcomes more, while teachers who improve test scores help girls more (Sachdeva 2026)
- Motivation is key theme in gifted education lit + evidence shows gender gaps among gifted students (Reis & McCoach 2000; Siegle & McCoach 2005; Matthews & McBee 2007)

Is it "non-cognitive" skills?

Hypothesis: College requires BOTH cognitive and noncognitive skills.

→ boys fall behind girls with same IQ due to their lower non-cog skills

→ boys fall short of their *potential*

→ gifted program raises boys' non-cogs to complement their high IQs

Complementary inputs to happiness: pivo & smažený sýr

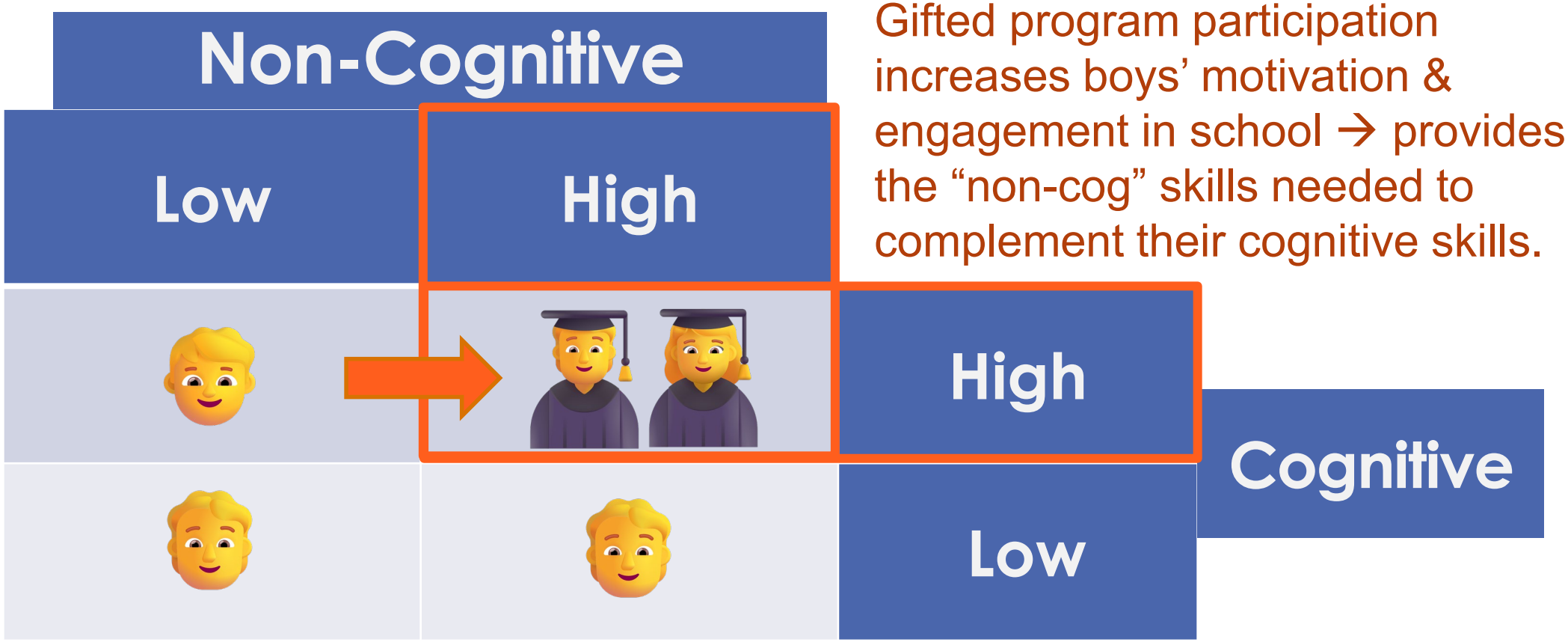
	pivo ? No	pivo ? Yes
sýr ? Yes		
sýr ? No		

Complementary inputs to college entry: cognitive & noncognitive skills

	Non-Cognitive: Low	Non-Cognitive: High
Cognitive: High		
Cognitive: Low		

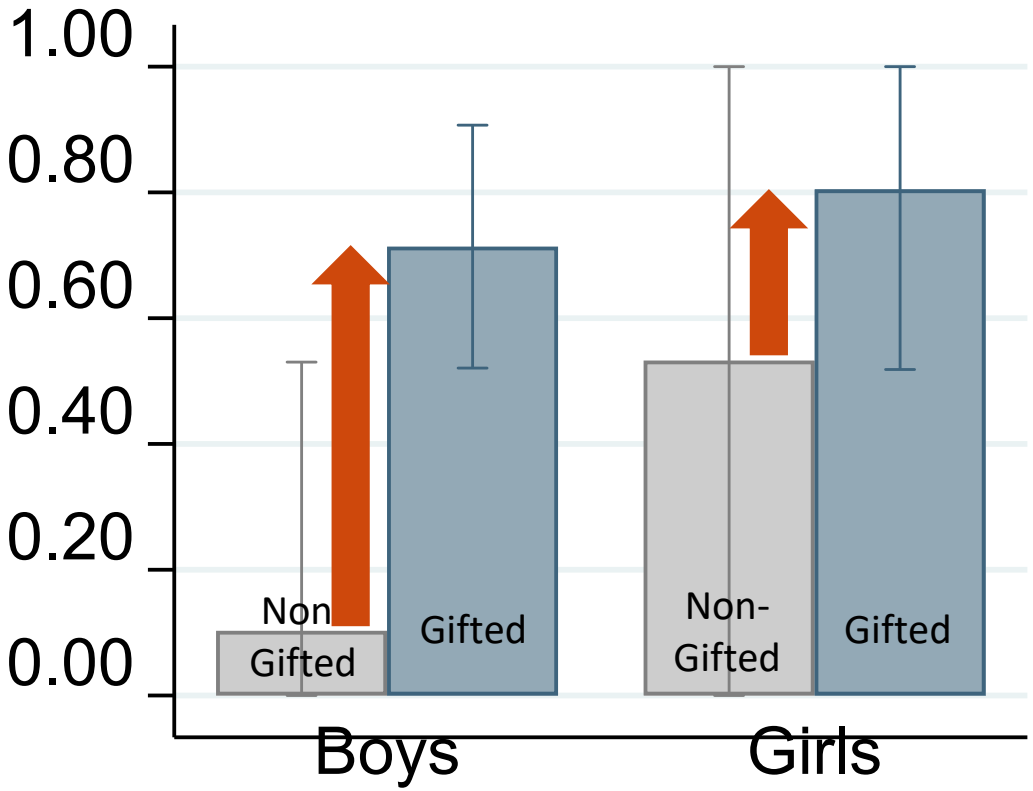
Gifted students already have high cognitive skills, but some (esp. boys) lack the non-cog. skills needed to get good grades & go to college

Complementary inputs to college entry: cognitive & noncognitive skills

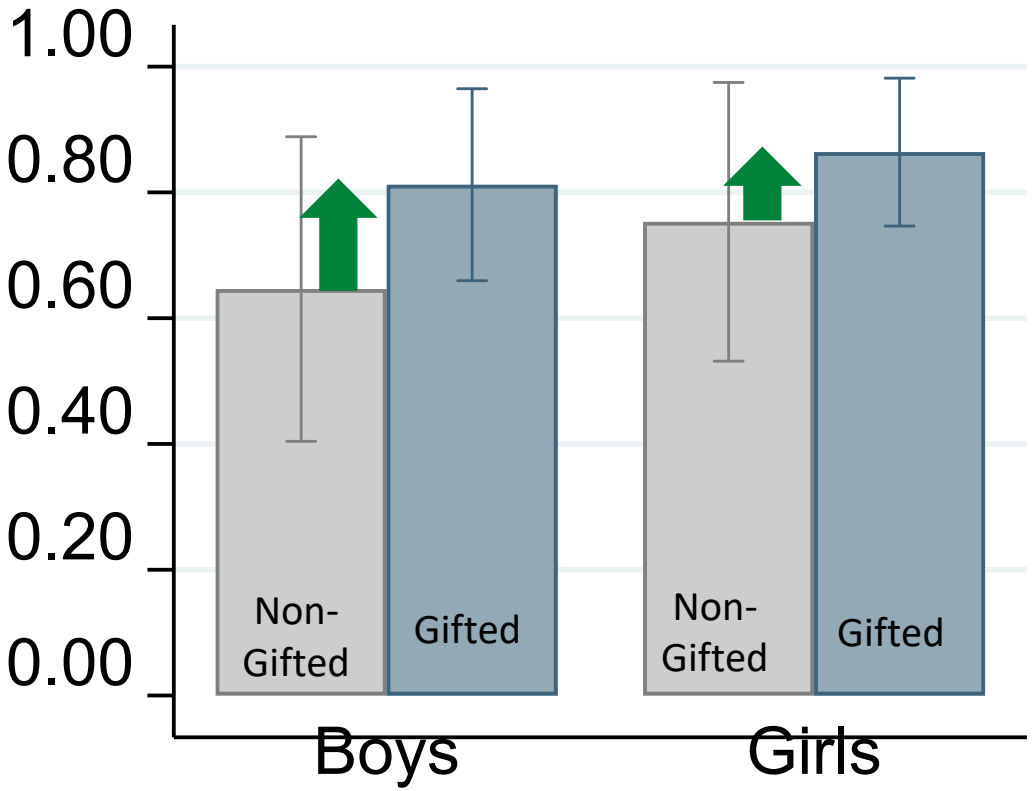


Gifted program participation increases boys' motivation & engagement in school → provides the "non-cog" skills needed to complement their cognitive skills.

Impact on college entry is much **larger** for boys and girls who report **low enjoyment of school** in 3rd grade



Low Enjoyment



High Enjoyment

Different setting, similar findings: Carlana, Ferrara & Pinotti (*Econometrica* 2022)

Setting: high-ability immigrant boys and girls in Italy

Intervention: academic tutoring and career counseling

Gender gaps among non-treated students: boys are less likely than girls to enroll in "high-track" high schools

Impact: immigrant boys increased their enrollment in high-track high schools → closed gap with girls with similar ability

Key Drivers: Increases in **student academic motivation;** improved **teacher recommendations**.

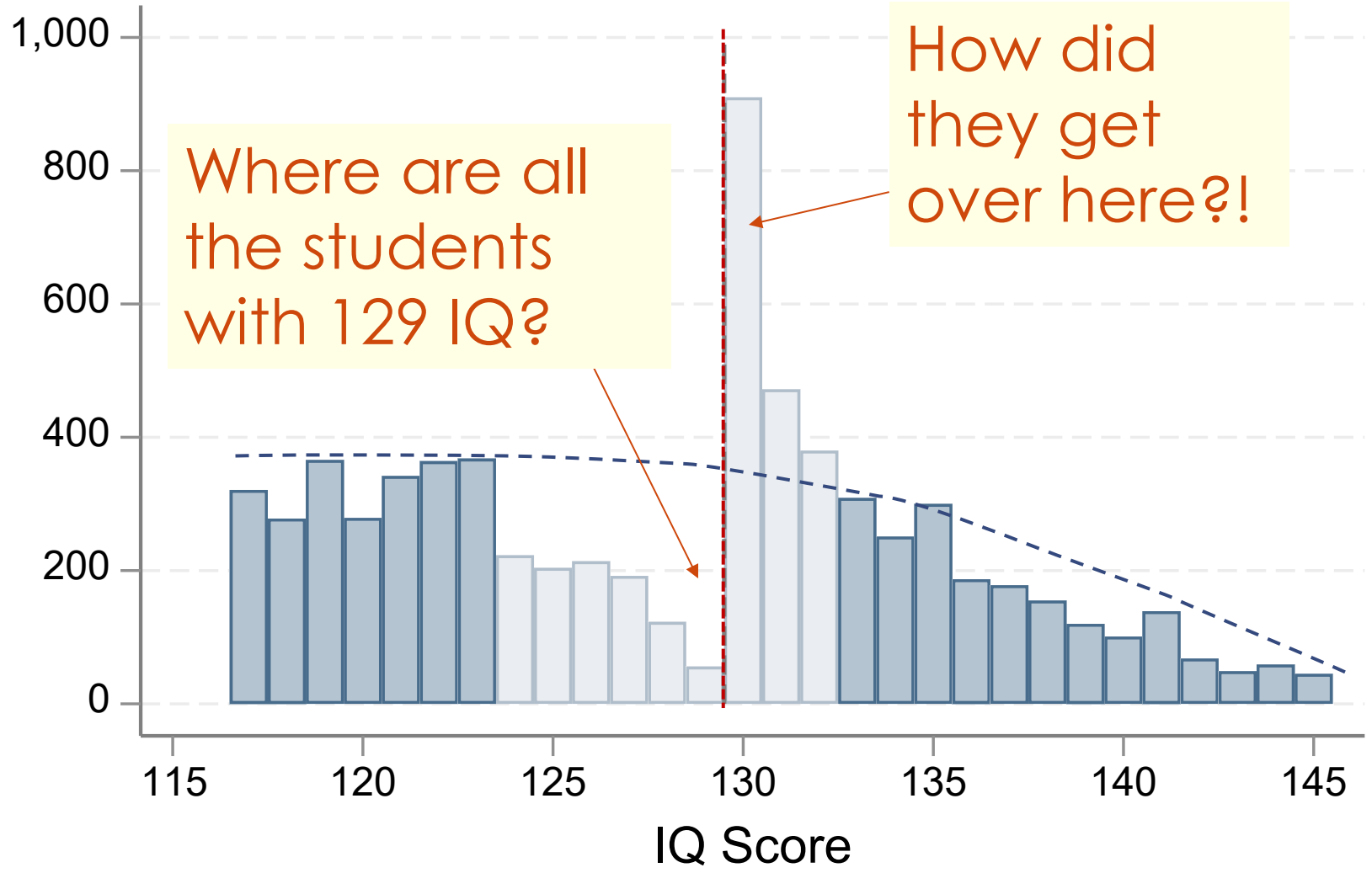
Does this mean students with high non-cog skills do not benefit from gifted education?

Not necessarily!

- For students with high ability and high non-cognitive skills, gifted education may provide other inputs – e.g., access to accelerated courses – that affect outcomes like college major.
- Non-cognitive support may also help girls and boys with higher levels of ability (IQ) to reach higher levels of potential (beyond college entry).

What about non-disadvantaged students?

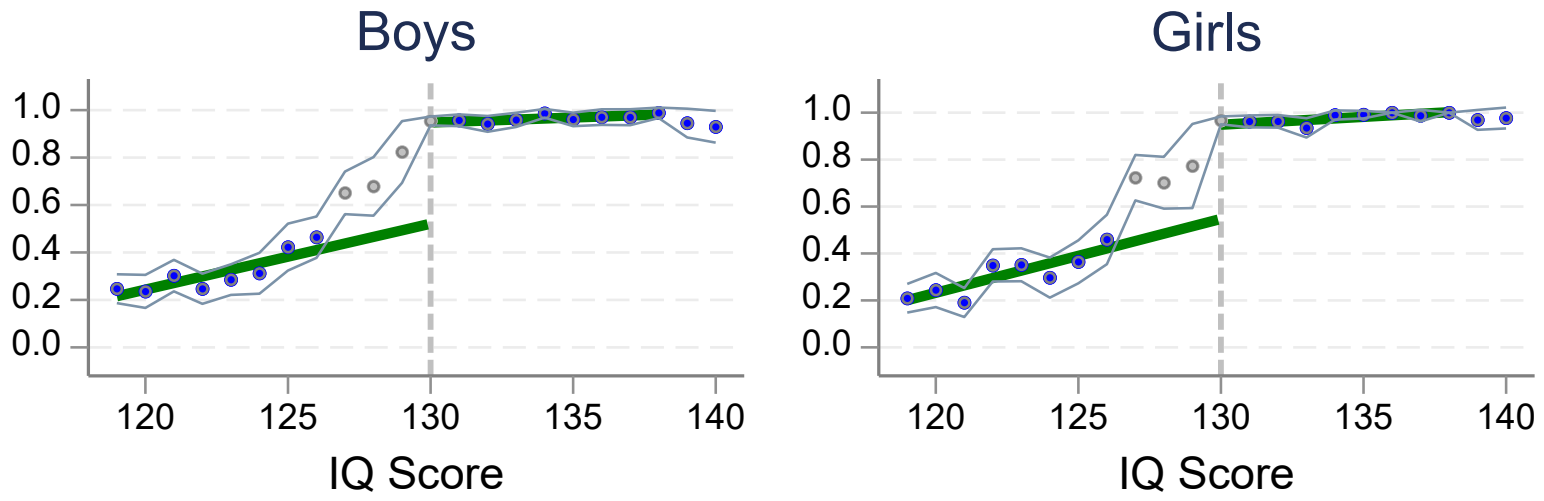
Distribution of IQ scores for non-disadvantaged students




IQ POINTS FOR SALE
✓ Higher test scores
✓ Better opportunities
✓ A brighter future
+1 IQ point $500
+2 IQ points $1,000
+3 IQ points $1,500
+4 IQ points $2,000
+5 IQ points $2,500
Gifted Guarantee $5K
Cognitive Performance
Education & Opportunity

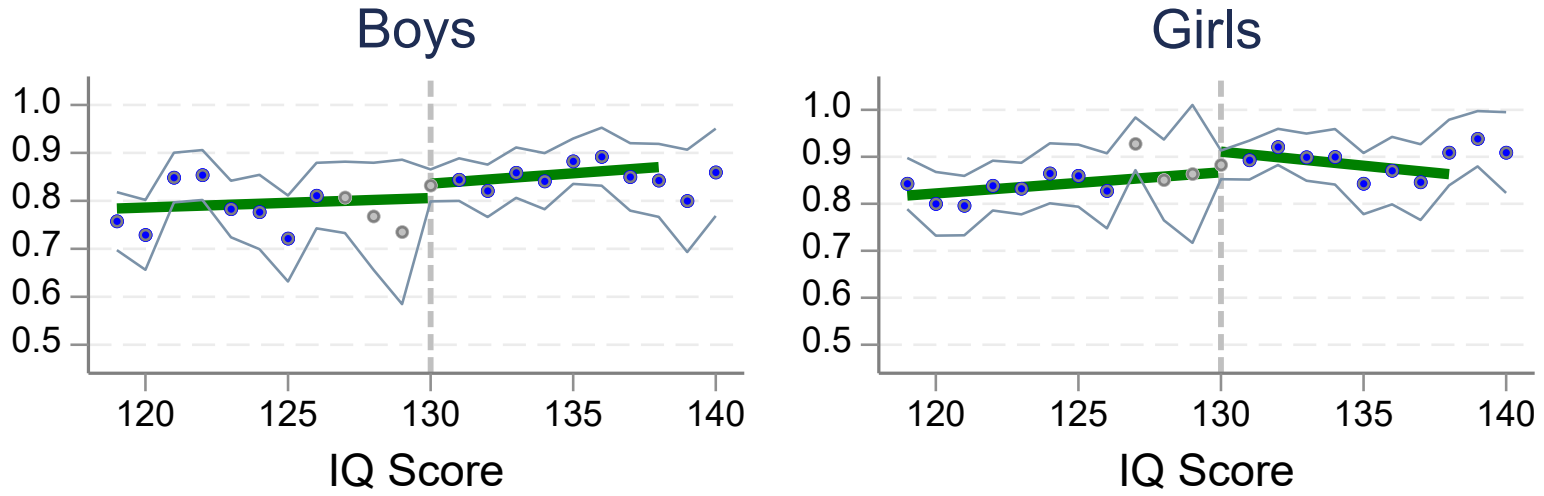
"Regression Discontinuity Evidence" for Non-Disadvantaged Students

Fraction Gifted →

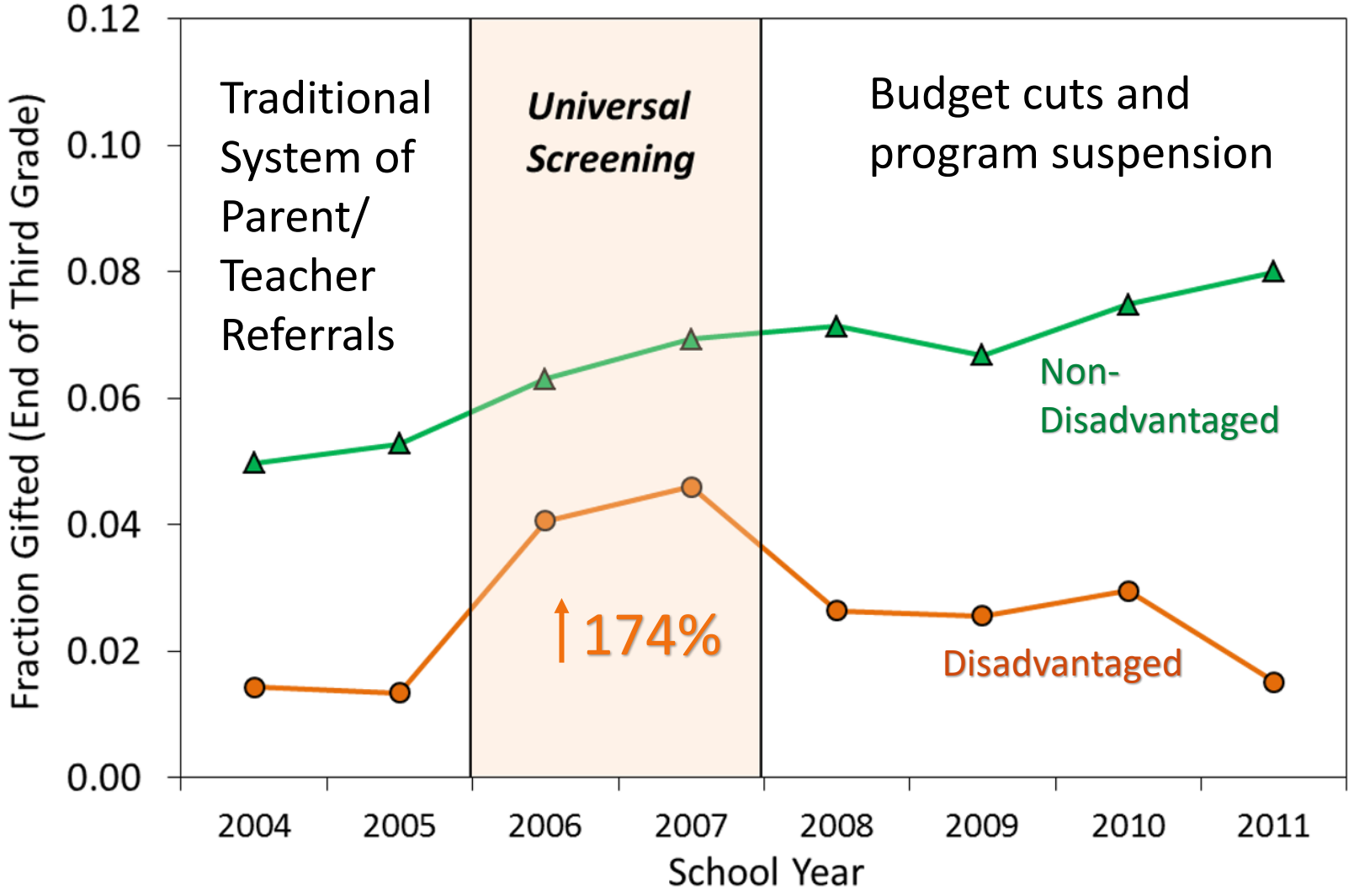


Very little impact on college entry →

but rates are high (>80%) even for non-gifted children

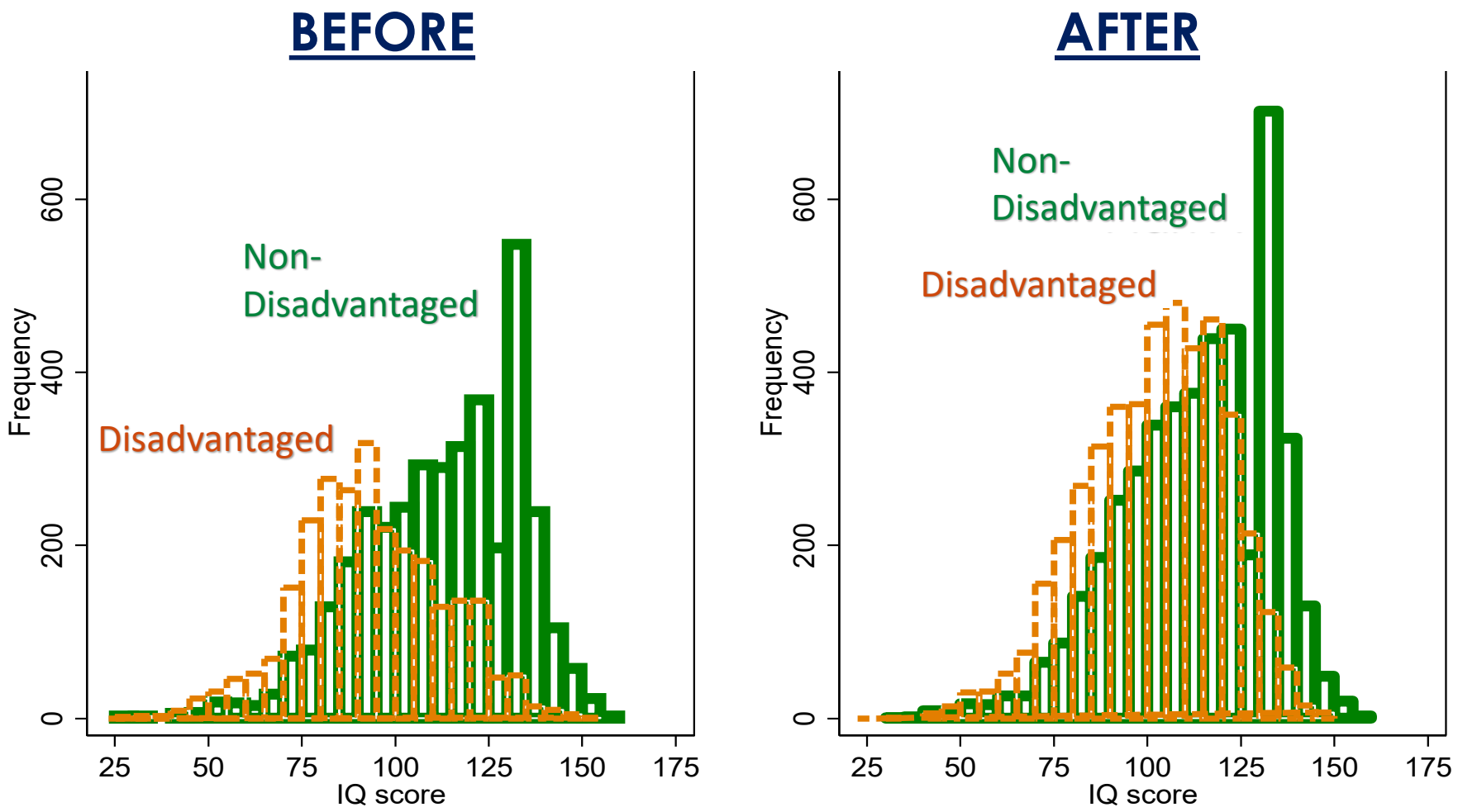


Universal screening increased representation of disadvantaged children in gifted program (Card & Giuliano, *PNAS* 2016)



Under traditional system of teacher/parent referrals, high-ability disadvantaged students were *much less likely* to be referred for gifted evaluation.

Distributions of 3rd-Grader IQ scores, Before and After Universal Screening



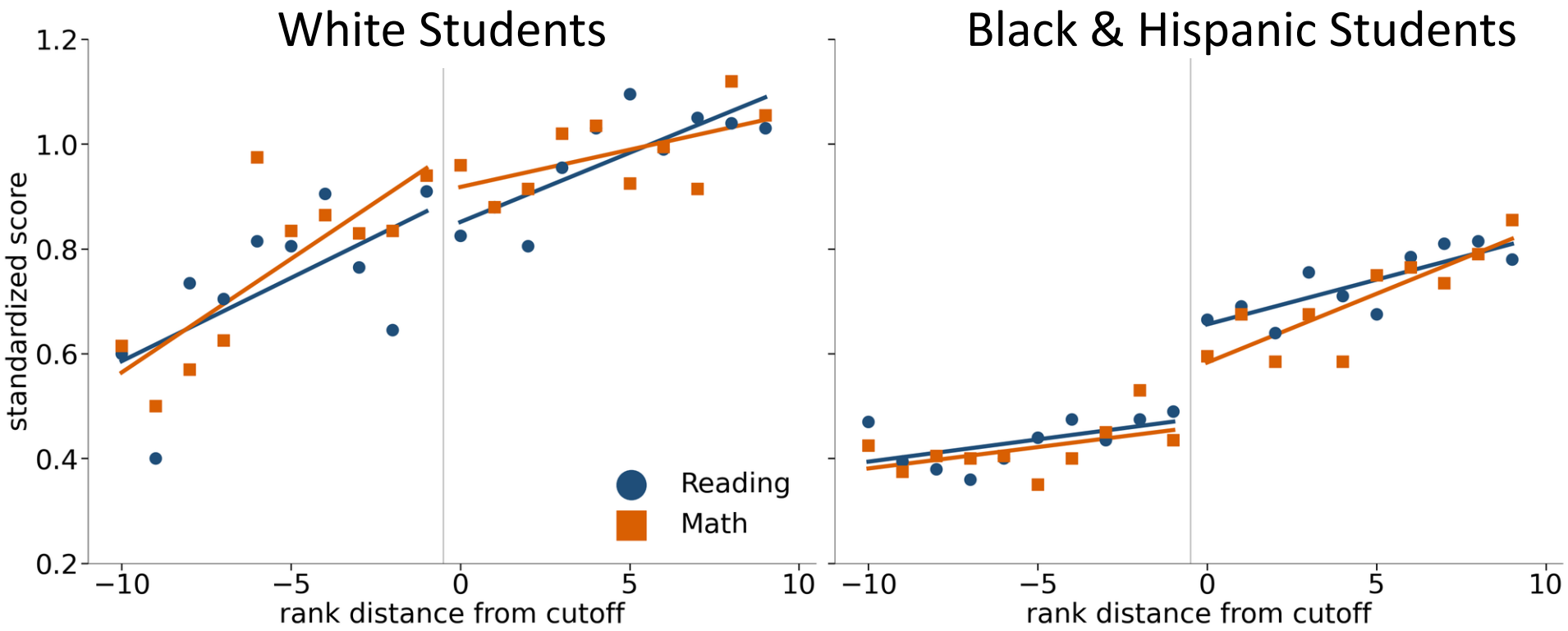
2. Tracking (test-based placement) into Gifted/High Achiever (GHA) classrooms raised test scores for non-gifted, Black & Hispanic students

Card & Giuliano (*American Economic Review* 2016)

Context / Features of Program

- Separate GHA classrooms in grades 4 & 5 at all schools with ≥1 gifted student.
  - Most schools have <5 gifted students
  - GHA classrooms are same size as regular (20-24 students)
  - Extra seats filled by *non-gifted* students with highest scores (*within school/cohort*) on prior year standardized tests ("high achievers")
- GHA classes cover same grade-level curriculum, use same textbooks
  - Usually faster pace (+ enrichment activities for gifted children)
  - Gifted endorsed teachers – trained on teaching "special populations / minorities"

Fourth-grade standardized test scores, by race/ethnicity

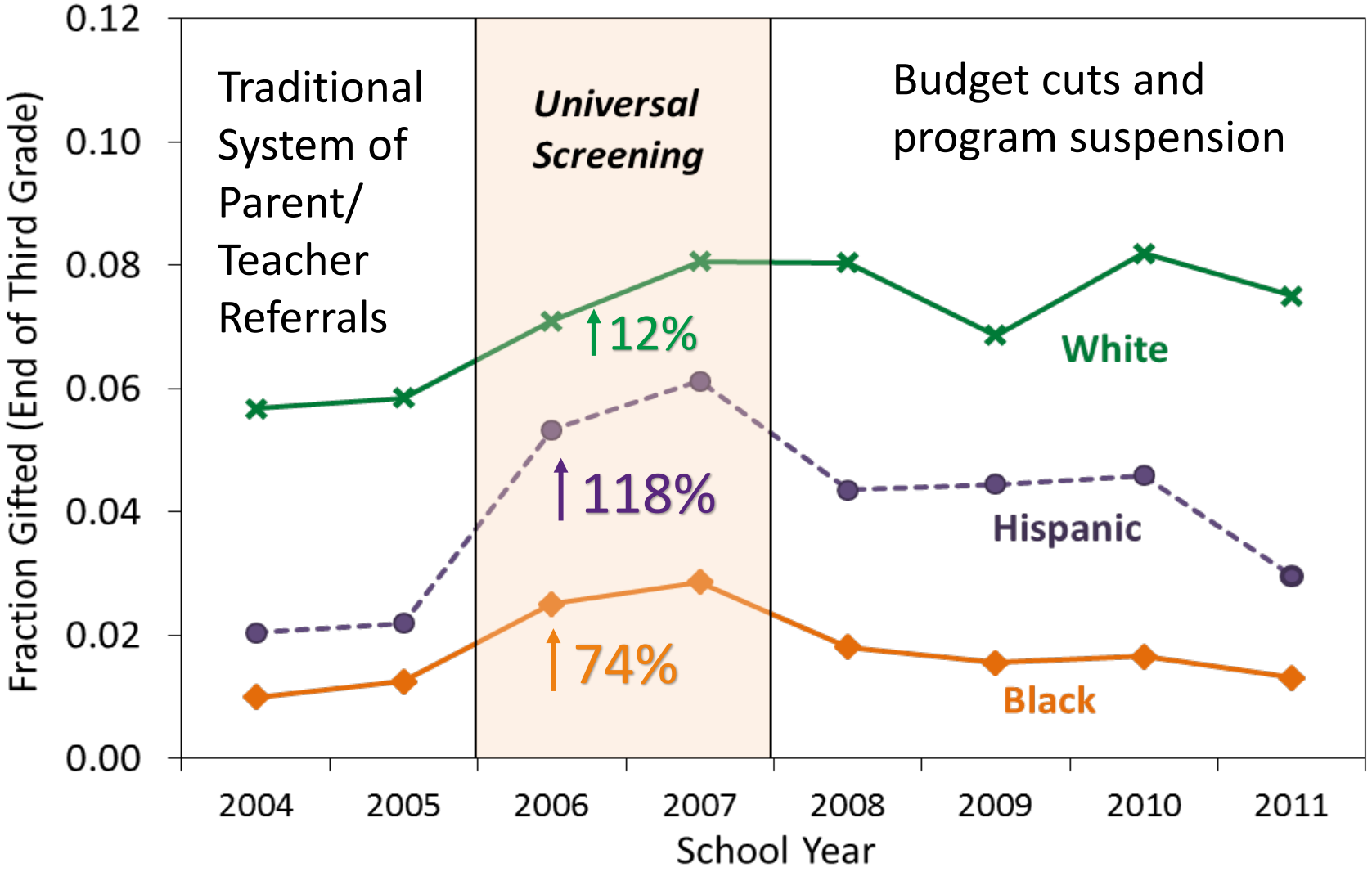


For Black and Hispanic students, being placed in gifted/high achiever classroom in 4th grade led to .4 - .5 σ increase in test scores.

Why the impacts on test scores?
Why only for minorities?

- *Why test scores*?
  - Most GHA classrooms are similar to "tracked" classroom – faster pace, but still focused on achievement, especially for non-gifted students
- *Why minorities*? → *Question*: what input is…
  - important for test-score gains
  - missing for many minority, but not white children, in regular classroom
  - plausibly increased by placement in GHA classroom?
- Hypothesis: minority students held to lower expectations in regular classroom (by teachers, parents)

Universal screening increased representation of minority groups in gifted program (Card & Giuliano, *PNAS* 2016)



Absent universal screening, high-ability Black and Hispanic students are *much less likely* to be referred for gifted evaluation.

Related evidence from other settings

- Carlana, Patacchini, Miserocchi (WP, 2026) – RCT in Italy:

  Teachers tend to under-estimate potential of disadvantaged students – and so are less likely to recommend them for demanding academic tracks. Teachers change their behavior when given more information.

- Dizon-Ross (AER 2019) – RCT in Malawi:

  Disadvantaged families tend to be under-informed about children's ability, which affects their educational investments.

3. Targeted acceleration of middle school math affects college outcomes differently by gender and non-cognitive skill

Card & Giuliano (NBER Working Paper 2026)

Context / Features of Program

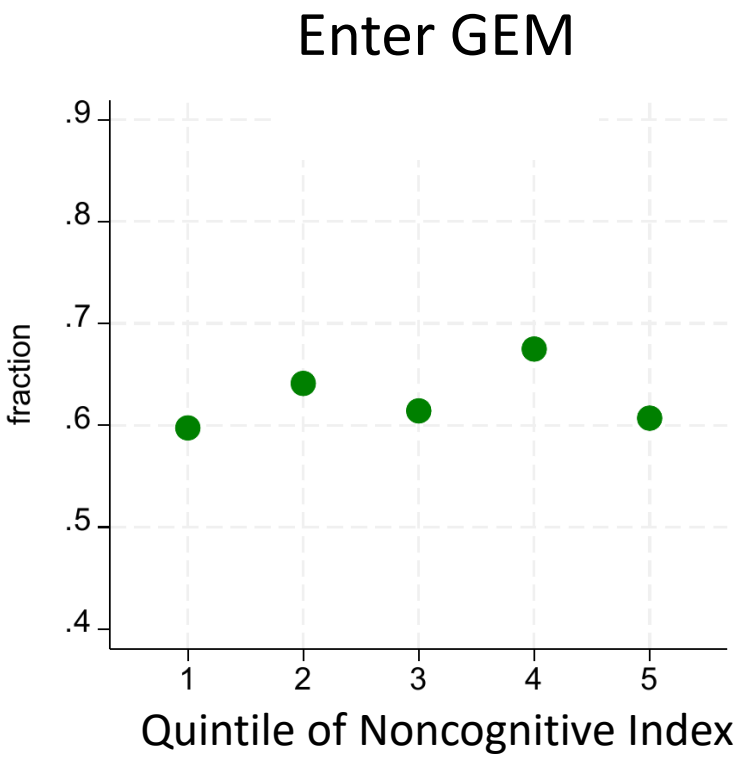
- Accelerated Track: “Great Explorations in Math” (GEM) for middle school (grades 6-8)
- 3-year curriculum compressed into 1 year; grades 7-8 accelerated by 2 years
- Eligible to enter in 6th grade if **5th-grade math score ≥ 80th percentile**
- Continuation in grades 7-8 requires **course grade of ≥B**
- Successful completers earn 2 years of HS math → can take Calculus + more in high school

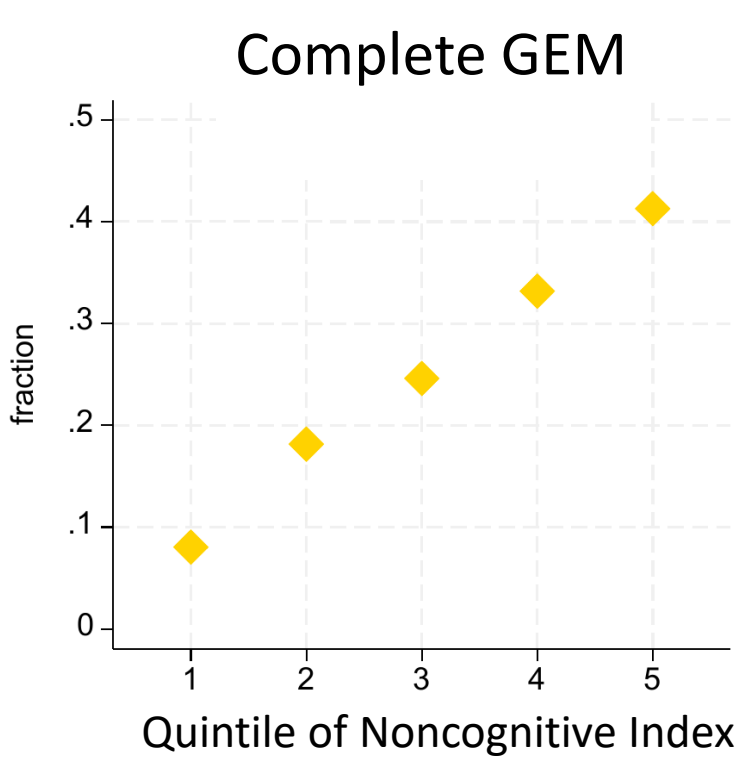
Successful completion of GEM → 2 extra years in HS

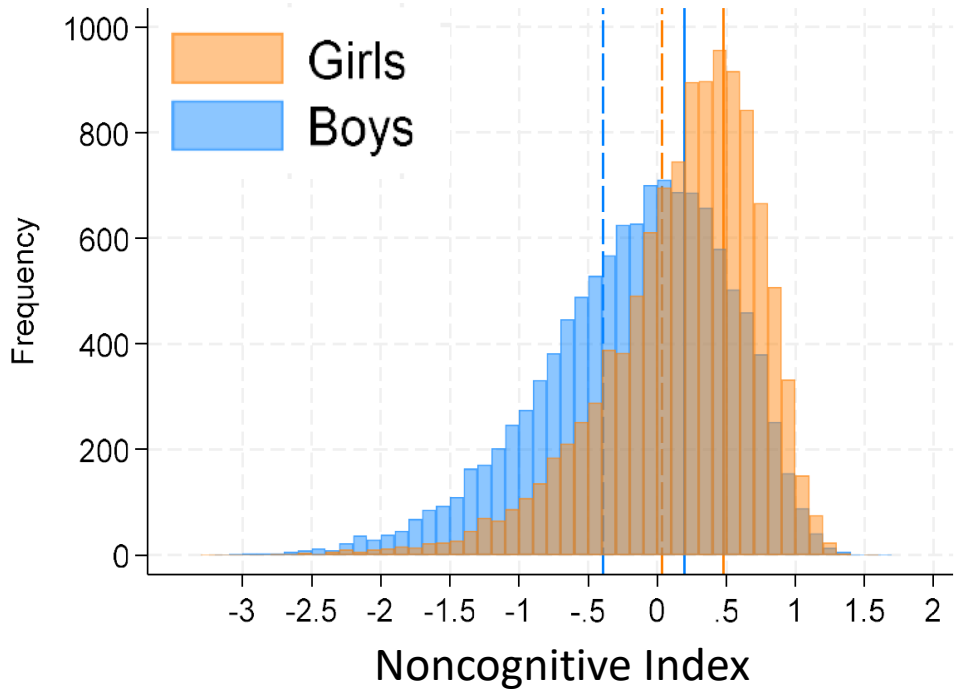
	Middle school			High school			
	Grade 6	**Grade 7**	**Grade 8**	**Grade 9**	**Grade 10**	**Grade 11**	**Grade 12**
Regular (standard in US)	MS math	MS math	MS math	Algebra I	Geometry	Algebra II	Pre-calc / Stats / Other
Advanced (accelerated 1 year)	MS math (adv.)	MS math (adv.)	Algebra I	Geometry	Algebra II	Pre-calculus	Calculus
GEM Program (2 years ahead)	Pre-algebra (compressed)	Algebra I	Geometry	Algebra II	Pre-calculus	AP Calculus (AB)	AP Calc BC / AP Stats / Dual Enrol.

Who persists in GEM track?

- We study those who are eligible with math scores at the 80th percentile
- We look separately by gender and measure of "non-cognitive" skills, which are required for successful completion.

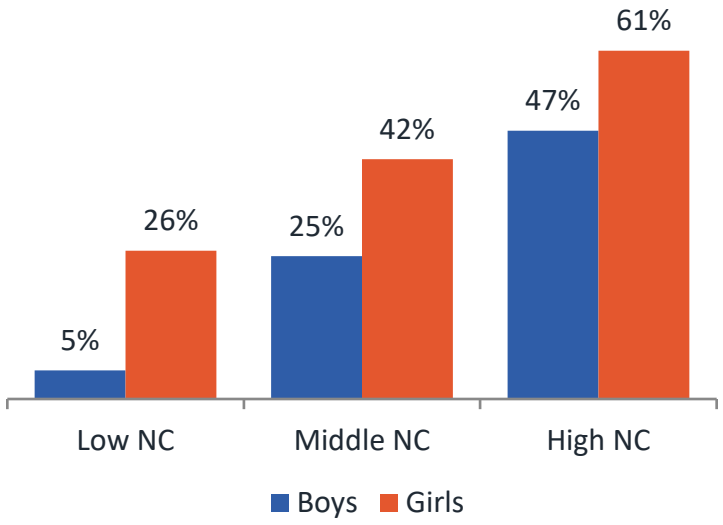




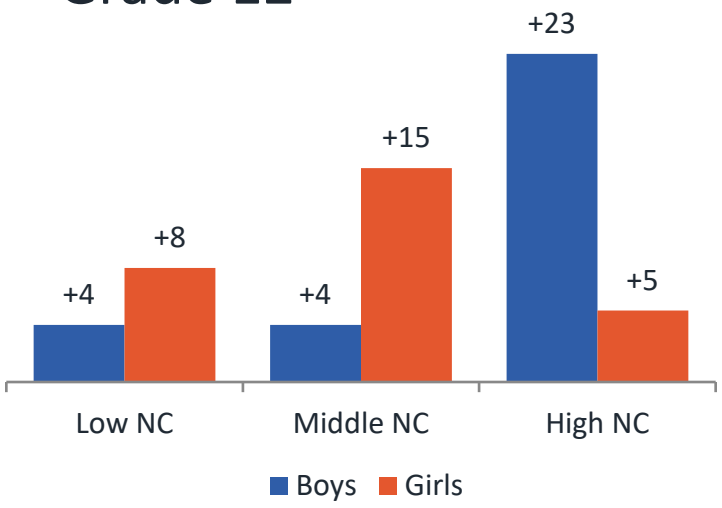


GEM helps most where students have both the skills to finish and room to grow

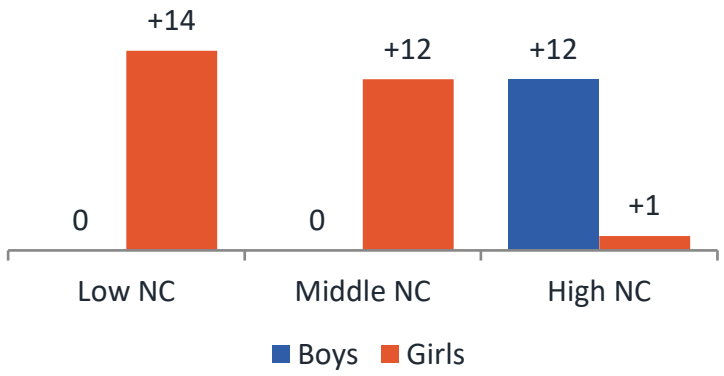
1. Finishing GEM



2. Impact on Calculus by Grade 12



3. Impact on Bachelors degree in STEM/business



Biggest gains
Low/mid-NC girls and high-NC boys can finish GEM and still have room to grow

No gain at the bottom
Low-NC boys mostly did not stay on the track: they lacked the skills to finish

Small gain at the top
High-NC girls already do well without GEM, so there is little room to add



Thank you!

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References

Bui, Sa A., Steven G. Craig, and Scott A. Imberman. 2014. “Is Gifted Education a Bright Idea? Assessing the Impact of Gifted and Talented Programs on Students.” *American Economic Journal: Economic Policy* 6(3): 30-62.

Card, David, Eric Chyn and Laura Giuliano. 2026. “Can Gifted Education Help Higher-Ability Boys from Disadvantaged Backgrounds?” *Journal of Political Economy*, forthcoming.

Card, David and Laura Giuliano. 2014. “Does Gifted Education Work? For Which Students?” National Bureau of Economic Research Working Paper No. 20453.

Card, David and Laura Giuliano. 2016a. “Universal Screening Increases the Representation of Low-income and Minority Students in Gifted Education.” *Proceedings of the National Academy of Sciences* 113(48): 13678-13683.

Card, David and Laura Giuliano. 2016b. “Can Tracking Raise the Test Scores of High- Ability Minority Students?” *American Economic Review* 106(10): 1-35.

Carlana, Michela, Eliana La Ferrara, and Paolo Pinotti. 2022. “Goals and Gaps: Educational Careers of Immigrant Children.” *Econometrica* 90(1): 1-29.

Carlana, M., Miserocchi, F., & Patacchini, E. 2026. “Tracking Inequality: Teachers and the Allocation of Educational Opportunities” Discussion Paper DP21891. Centre for Economic Policy Research (CEPR).

References, cont'd.

Chin, J., & Kocks, G. 2025. "Sorting or supporting? The effect of gifted education on achievement and access." Job Market Paper. Massachusetts Institute of Technology.

Dizon-Ross, Rebecca. 2019. "Parents' Beliefs about Their Children's Academic Ability: Implications for Educational Investments." *American Economic Review* 109 (8): 2728–65.

Matthews, Michael S., & McBee, Matthew T. 2007. "School Factors and the Underachievement of Gifted Students in a Talent Search Summer Program." *Gifted Child Quarterly* 51(2), 167–181.

Reis Sally M. and D. Betsy McCoach. 2000. "The Underachievement of Gifted Students: What Do We Know and Where Do We Go?" *Gifted Child Quarterly* 44:152–170.

Siegle, Del and D. Betsy McCoach. 2005. *Motivating Gifted Students*. Waco, TX: Prufrock Press.

Sachdeva, Gagandeep. 2026. "Relative Skills in the Classroom: Teachers' Gender-Differentiated Impacts on Test Scores and Course Grades." Job Market Paper. University of California, Santa Cruz.