



Big Fish in Small Pond or Small Fish in Big Pond? Tracking and the Distribution of Student Achievement

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Abstract

Tracking—assigning students to different schools or classrooms based on their prior academic performance—has been widely practiced across educational systems, including in the United States, China, and OECD countries. However, the long-term impact of tracking on the distribution of student achievement has been yet to be explored empirically. This study revisits the question: Is it more beneficial to be big fish in a small pond or small fish in a big pond? Our setting is two representative counties in China where first-year senior high school students are tracked in two steps based on their performance on the provincially standardized Senior High School Entrance Exam (SHSEE), first into high-achieving and regular schools, and then into high-achieving and regular classrooms within schools. Using a unique administrative dataset covering 27,406 test-takers from two counties who participated in the National College Entrance Exam (NCEE) between 2016 and 2024 and a regression discontinuity design, we show that on the whole, admission into high-achieving schools and classrooms increases students’ NCEE scores by 0.17 and 0.28 standard deviations (SD), respectively, with a increasing trend in the magnitude of the estimated coefficients during the study period. We also find admission into high-achieving schools and classrooms significantly raises students’ probability of being admitted into top tier universities and being admitted to high starting-salaries majors. We provide evidence that the most likely mechanisms underlying these findings are exposure to better teachers and peers. Further analyses suggest that the top 10% performing students in regular schools and classrooms outperform the bottom 10% performing students in high-achieving schools and classes by 0.04 SD and 0.07 SD, respectively, mostly likely driven by self-confidence over their senior high school years. These results remain robust across multiple specifications, including adjustments to the bandwidth and the use of subject-specific scores.

Motivation & Contribution

- Tracking is a fundamental policy in K-12 education worldwide, yet its distributional effects and long-term consequences remain mixed. Critics argue it widens educational inequality, while proponents claim it tailors instruction to student ability.
- Most studies examine tracking in primary or middle school, with limited evidence on senior high school, which is a critical period shaping college admission and lifelong outcomes.
 - Prior work focuses on high-achievers or low-achievers separately, ignoring academically marginal students who face the “big fish or big pond” dilemma.
 - Unlike most prior studies that examine either high-achieving schools or high-achieving classrooms, we jointly investigate both of them and compare students across four distinct settings.
 - Our outcome measures come from near-census, high-stakes standardized examinations within the study region.

Understanding which effect dominates is key for the design of tracking and classroom assignment policies that aim to maximize both equity and efficiency.

Data Sources

- 1. National College Entrance Exam Administrative Data:**
- Two representative counties in Shandong Province
 - NCEE score, admission college, and admission major of all of the 27,460 students from the senior high schools between 2016 and 2023
 - A repeated cross-sectional dataset
- 2. Senior High School Entrance Exam Administrative Data:**
- Each NCEE taker’s corresponding SHSEE scores from 3 years ago
 - The cutoff SHSEE score for class allocation set by each senior high school
 - The cutoff SHSEE score for school allocation set by the education department

Identification Strategy

- Assignment to a high-achieving school/class is determined by SHSEE scores with cohort-specific cutoffs set by local education department and senior high schools, respectively. We implement a fuzzy regression discontinuity design comparing students just above (assigned to high-achieving environment) and just below (assigned to ordinary environment) each cutoff.
- Running variable:
standardized HSEE score
 - Treatment variables:
 $Eliteschool_i = 1$ if student is assigned to high-achieving school; 0 otherwise.
 $Eliteclass_i = 1$ if student is assigned to high-achieving classroom; 0 otherwise.
 - Outcome variables:
standardized NCEE score; admission to regular colleges, project 211 colleges, project 985 colleges, project double-1st-class colleges; admission to high starting-salaries major
 - Controls:
Pupil FE, Classroom-Year FE, Track-Year FE; Individual characteristics; Examination characteristics

Conclusion

- On average, enroll in high-achieving schools and classes raises students’ NCEE scores by 0.17 and 0.28 SD respectively.
- It also significantly boosts students’ odds of top colleges and high-salary majors.
- The top 10% in regular schools/classes outscore the bottom 10% in elite ones by 0.04 and 0.07 SD.
- Key mechanisms are better teachers/peers; students’ confidence accumulation during high school may explain performance gaps between “leaders” and “laggards”.

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Warmly welcome to communicate via email!
Any comments will be greatly appreciated!