School Choice and Academic Achievement in Comparative Perspective

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Background and Hypotheses

This study explores the relationship between school choice and reading and math achievement scores of fifteen-year-old students internationally. We will try to gain an understanding of the factors that contribute to achievement scores and how it is that school choice impacts test scores after a range of other variables are taken into account.

There are two competing hypotheses regarding the effects of school choice. The first argues that school choice improves outcomes, as it provides incentives for schools to improve by letting parents choose the best school and it gives principals more autonomy to change and improve schools (Friedman 1955, Greene 2005). If this is true, the factors of competition, dependent private schools, and autonomy should be both significant and positive. The second hypothesis states that school choice is the root of the seemingly positive effect of school choice (Carnoy 2007, Ravitch 2010). If the effect of school competition spurs school-level socioeconomic status, this hypothesis is supported.

Data

This analysis uses data collected in the 2009 Programme for International Student Assessment, referred to as PISA. This data set includes information from sixty-five countries, although France is not included in this analysis, as France did not provide responses to the school survey. In the remaining sixty-four countries, a total of 476831 fifteen-year-old students were randomly selected to take the standardized test, which assessed their academic achievement in reading and mathematics. The students also completed surveys regarding personal characteristics, including socioeconomic status and language spoken in the home. The administrators of the 16977 corresponding schools completed school-level surveys. This information allows for PISA to provide data regarding a range of topics (PISA 2009).

Although not a part of the PISA data, the 2009 Human Development Index, referred to as HDI, is used to assess socioeconomic status at the country level through an assessment of the country’s level of development. The HDI is constructed using three dimensions, specifically health, standard of living, and education, which are made up of four indicators of development: life expectancy, gross national income per capita, and years of schooling. This data analysis was conducted using hierarchical linear modeling, in which the student level is nested within the school level, which is then nested within the country level. Refer to the “Variables” section for details regarding the composition of each level.

Results

• In the initial model (Model 1), in which competition and HDI are the only factors, competition has a significant effect, whereas other school with which to compete accounts for an increase of 14% of a standard deviation in math score and competition with two or more other schools accounts for an increase of 24% of a standard deviation
• When size of community is added to the model (Model 2), the competition variables remain significant, but the positive effect of competition against one school and two or more schools drop to 9% and 14% of a standard deviation in math score, respectively
• School sector (Model 3) does not greatly alter the effect size of competition, leaving the positive impact of one competing school essentially unchanged, while the effect of two or more schools now indicates an increase of only 12% of a standard deviation in math score.
• Measures of principal autonomy (Model 4) also fall to greatly alter the magnitude of the effect of competition, raising scores by approximately 8% of a standard deviation with one competing school and 11% with two or more competing schools
• School selection policies, teacher characteristics, and school characteristics (Model 5) do not alter magnitude significantly, either, leaving the magnitude of the competition variables approximately equivalent to those seen in Model 4
• The inclusion of student-level traits (Model 6) decreases the magnitude of change, making one competing school add only 7% of a standard deviation to scores and two or more competing schools add just below 10% of a standard deviation to score.
• The final model (Model 7) factors in school-level socioeconomic status, at which point significance of both competition variables is lost.
• An examination of deviance statistics confirms that Model 7 is the model of best fit, showing the spuriousness of competition's effects.

Models

This data analysis was conducted using hierarchical linear modeling, in which the student level is nested within the school level, which is then nested within the country level. Refer to the “Variables” section for details regarding the composition of each level.

Model 1: Achievement = f(HDI, Competition)
Model 2: Achievement = f(HDI, Competition, Size of Community)
Model 3: Achievement = f(HDI, Competition, Size of Community, School Sector)
Model 4: Achievement = f(HDI, Competition, Size of Community, School Sector, Principal Autonomy)
Model 5: Achievement = f(HDI, Competition, Size of Community, School Sector, Principal Autonomy, School Selection Policies, Teacher Characteristics, School Characteristics)
Model 6: Achievement = f(HDI, Competition, Size of Community, School Sector, School Selection Policies, Teacher Characteristics, School Characteristics, Opportunity to Learn, Student Characteristics)
Model 7: Achievement = f(HDI, Competition, Size of Community, School Sector, School Selection Policies, Teacher Characteristics, School Characteristics, Opportunity to Learn, Student Characteristics, School Level Socioeconomic Status)

Conclusions

The results of these analyses support the second hypothesis, suggesting that school choice does not, in fact, have an effect on achievement scores, nor do measures of principal autonomy. Because the positive relationship between school choice and achievement becomes spurious after school-level socioeconomic status is taken into account, these results lead to the conclusion that selection bias, stratification, or possibly socioeconomic status based peer effects account for any correlation between students attending schools with greater amounts of competition and higher achievement scores. In sum, voucher schools and schools with a lot of competition perform better because on average, they have a wealthier student body than other schools.

Furthermore, these analyses are conducted with reading achievement scores and the relevant covariates, the conclusions are consistent with the math analyses. Additionally, these conclusions can be drawn from the analyses of individual countries as well, demonstrating that these conclusions are also consistent internationally. These findings indicate that many of the proposals for education reform, specifically in the United States, should be revisited and revised.

Acknowledgements

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References


Variables

Dependent Variables:
• Math Achievement Score
• Reading Achievement Score

Key Independent Variables:
• One other school to choose from
• Two other schools to choose from

Country-Level Independent Variable:
• Human Development Index

School-Level Independent Variables:
• School Sector
• Size of Community (omitted City)
• Principals Autonomy
• School Level Socioeconomic Status
• School Selection Policies (omitted Never)
• Teacher Characteristics
• School Characteristics

Student-Level Independent Variables:
• Opportunity to Learn
• Student Characteristics

Table of Results: Mathematics

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*See Table of Means and Descriptive Statistics for full list of Variables.