Insert brief summary of paper

**Kshitij**

1. Parental Involvement and Adolescents’ Educational Success: The Roles of Prior Achievement and Socioeconomic Status - Aprile D. Benner1 • Alaina E. Boyle1 • Sydney Sadler1

**(a) the main idea –** Parental involvement (both home and school based) is found to be beneficial for long student’s grades for low SES families (those with poor prior achievemnt and low SES) while academic socialization is beneficial for high SES (prior achievement, high SES) families.

**(b) why (or why not) it will be useful for your project –** Parental involvement could be a lurking variable and if we can find a proxy for it, we need to control for it in our model.

**(c) its potential shortcomings, that you will try to improve upon. –** Our problem statement is different, so we aren’t necessarily trying to improve upon the results of this paper. However, one possible source of error in this analysis is the possible lurking relationship between the covariates used – There could be conditional effects relating to school based involvement and high SES. The variable being modelled here (short term score -12th grade and long term score – educational attainment after 8 years) could also drive the parental involvement thereby introducing a lot of random effects. A machine learning model could have better captured these complex relationships, but the authors have relied on using parametric models. In our study, our hope is to use machine learning if we suspect any random effects/lurking relationships.

1. The Role of Admissions Test Scores, Socioeconomic Status, and High School Grades in Predicting College Achievement - Rebecca Zwick - Pensamiento Educativo. Revista de Investigación Educacional Latinoamericana 2012, 49(2), 23-30

**(a) the main idea –** Although poor grades and low standardized test scores do not necessarily imply low SES but low SES has a high correlation with poor grades and low standardized test scores. Further there have been systemic prediction errors for performance at ethic-group level which can be explained by the underlying difference in SES within the same ethnic group.

**(b) why (or why not) it will be useful for your project –** Reinforces the idea that low SES correlates with low scores and low GPA which is related to the main theme of our study. Further we must be careful when controlling for ethnic group. It might make some sense to not consider it a SES factor

**(c) its potential shortcomings, that you will try to improve upon. –** There could be a possible instance of Simpson’s paradox where in an effort to determine the relationship between high school grades and SES, family income is used as an indicator of SES but the correlation is calculated for each student irrespective of the school and aggregated to give a correlation number. This could be inaccurate because within school relationships can widely differ and could also depend on the school’s SES. Therefore the city wide number is a poor proxy for the ‘average school’ number. Therefore, the correct way of doing it could be calculating correlation at a high school level and then aggregating it to obtain the city-wide number. In our study our effort will be to calculate numbers at the most granular level and then aggregate it at every grouping level (could be done proportionally, if need be).

1. Juan Battle & Michael Lewis (2002) The Increasing Significance of Class: The Relative Effects of Race and Socioeconomic Status on Academic Achievement, Journal of Poverty, 6:2, 21-35, DOI: 10.1300/J134v06n02\_02

**(a) the main idea –** examines the relationship between race and SES and their relative effects on SES. Overall white students perform better than african-americans but when controlled for race african-americans actually performed better than their white counterparts if we consider results two years after high school. The opposite is true for 12th grade results. SES is more than 3 times as important as race when predicting outcomes. Beta for african americans in the model is lower which implies that they don’t see the same benefit of increase in SES as whites do.

**(b) why (or why not) it will be useful for your project –** If we end up considering race, we might have to control for it to get the true SES effect. Reinforces the main theme of the project that SES is an important predictor of student outcomes.

**(c) its potential shortcomings, that you will try to improve upon. –** Once again, the performance difference between whites and african-americans for 12th class maybe due to a range of factors that a parametric model couldn’t possibly account for. And this necessitates the need for a machine learning model.

**Dave**

1. Ruth Berkowitz - University of Haifa - A Research Synthesis of the Associations Between Socioeconomic Background, Inequality, School Climate, and Academic Achievement*DOI: 10.3102/0034654316669821 © 2016 AERA*
   1. *Keywords: school climate, compensation, mediation, moderation, academic achievement, achievement gap*
   2. *Summary: <insert thoughtful summary here>*
2. Ray Domanico - Education Policy - 03/2020 - NYC Student Achievement (0.5 article) <https://eric.ed.gov/?id=ED604331>
   1. Summary: <insert thoughtful summary here>
3. Examining Gender and Race Bias in Two Hundred Sentiment Analysis Systems (0.5 Paper)
   1. Summary: <insert thoughtful summary here>
4. Farooq - University of Punjab, Pakistan - 2011 - Factors Affecting Students’ Quality of Academic Performance: A case of Secondary School Level
5. Chen, G., & Weikart, L. A. (2008). Student background, school climate, school dis- order, and student achievement: An empirical study of New York City’s middle schools. Journal of School Violence, 7(4), 3–20. doi:10.1080/15388220801973813
6. Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. Review of Educational Research, 75, 417–453. doi:10.3102/ 00346543075003417

**Ben**

1. Winters, M.A. Measuring the effect of charter schools on public school student achievement in an urban environment: Evidence from New York City. 2012.

Objective:

* Investigate academic achievement of students remaining in public schools that lose enrollment to charter schools in densely populated urban areas (NYC).
* Defined charter school exposure: percent of students who exited for a charter school at the end of the previous year.

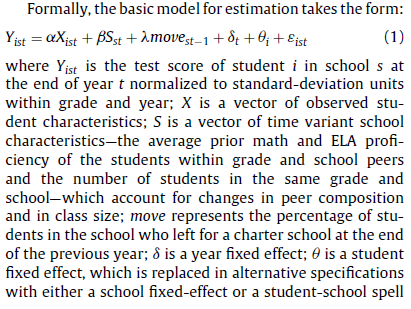
Data:

* Uses student level longitudinal data from New York City Department of Education. Math and English Language Arts (ELA) test scores and demographic information.

Conclusion:

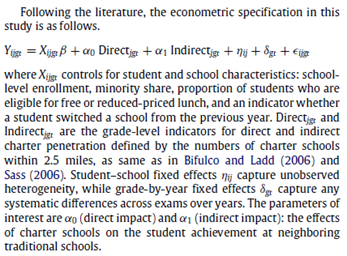
* Conclusion students in public schools with highest exposure were unaffected or benefited mildly in both math and English.

Method:



* Uses student level longitudinal data. Identified students enrolled in public school one year and charter school the next to calculate the percentage of students who left for a charter school at the end of the previous year. Average public school lost 0.2 percent of students to a charter school. About 8 percent lost of 1 percent to a charter school.
* Assumes percent of students leaving a public school for charter school corresponds to the percent that would have been assigned to the public school but entered a charter school before third grade.
* Converted test scores into **standard-deviation units** within grade and year to normalize them. NY’s state assessment is not **vertically scaled**.
* Used student **fixed-effect** model to take into account time-invariant factors related to either the student of the school.
  + **Spell effect**: Seeks to account for a student’s math or ELA proficiency.
* Heilmeyer
  + How is it done today, and what are the limits of current practice?
    - Use linear fixed effects model to account for various effects on student outcomes.
    - Used percentage of students who changed to a charter school as the charter exposure score.

2. Jinnai, Y. Direct and indirect impact of charter schools’ entry on traditional public schools: New evidence from North Carolina. 2014.



Objective:

* No consensus has been reached regarding the direction or existence of effects of charter schools on neighboring public schools. Studies show conflicting results (includes Winters 2012 as positive effects).

Method:

* Past papers did not separate direct impact and indirect impact.
  + Direct impact: on grades that overlap with charter school grades.
  + Indirect impact: on grades that do not overlap.
  + Not separating by grades and combining entire school does not capture how students are not in an appropriate grade for the charter school may be little affected in any manner by it.
* Also used a **fixed-effect** model
* Charter school penetration/exposure defined as charter penetration defined as number of charter schools within 2.5 miles. Same as Bifulco and Ladd (2006) and Sass (2006).

Conclusion:

* Study shows positive and significant direct impact on student achievement at overlapping grades and no significant indirect impact for non-overlapping grades.

- Some examples of plots

o Average lowest grade and average highest grade level offered by charter schools.

Heilmeyer:

* How is it done today, and what are the limits of current practice?
  + Many studies combine direct and indirect impacts without distinguishing them. This study separates these effects.
  + Used charter schools in 2.5 mi radius as the charter exposure score. Same as Bifulco and Ladd (2006) and Sass (2006).
  + We could compare a fixed-effect model to a random forest model and determine if the random forest model could separate conflating effects automatically.

**Vuong**

1. (0.5) Perdro Domingos. How to Get a Free Lunch: A Simple Cost Model for Machine Learning Applications.

A simple cost model for implementing machine learning applications from the following inputs:

* System’s confusion matrix
* Application cash flow
* Cost per decision
* Cost of deploying system
* Return on investment

1. (1) Reyn van Ewijk and Peter Sleegers. “The effect of peer socioeconomic status on student achievement: A meta-analysis“ Educational Research Review, vol 5, no. 2, 2010, pp. 134-150

Researchers have reported varying results when studying the effects of peer socioeconomic status on student test scores. A meta-regression analysis of 30 such studies found that the size of the compositional effect was related to the model used, as well as how researchers chose to measure SES. According to the analysis, peer SES may be an important determinant of academic achievement.

1. (0.5) Tom Silver. Lessons from My First Two Years of AI Research

General lessons and specific AI tricks to help new researchers start off in the right direction

<https://web.mit.edu/tslvr/www/lessons_two_years.html>

1. (1) Eric A. Hanushek. “Assessing the Effects of School Resources on Student Performance: An Update” Education Evalution and Policy Analysis, vol. 19, no. 2, 1997, pp. 141.164

This study shows there isn’t a relationship between school resources and student achievement. Some resources used for this study

* Real Classroom resources
  + Teacher-pupil ratio
  + Teacher education
  + Teacher experience
* Financial aggregates
  + Teacher salary
  + Expenditure per pupil

**Nick**

1. *Murnane, Richard J. “U.S. High School Graduation Rates: Patterns and Explanations.” Journal of Economic Literature, vol. 51, no. 2, 2013, pp. 370–422., doi:10.1257/jel.51.2.370.* 
   1. Patterns in graduation rates
      1. Stagnation in last three decades of 20th century
      2. Significant race, gender, and income based gaps
      3. Significant increase in grad rates from 2000-2010
   2. Challenges in improving school quality
      1. Large percentage of economically disadvantaged students that are most affected by increasing graduation requirements enter school with weak cognitive and socioemotional skills
      2. Economically disadvantaged students tend to be clustered in a subset of schools where the peer group hinders a positive learning environment
      3. Difficulty in attracting skilled teachers to schools serving economically disadvantaged students
      4. High schools do not engage the interest and effort of teenagers
      5. Use of GED option by a significant number of students, sometimes encouraged by high school staff
2. *Heckman, James J, and Paul A Lafontaine. “The American High School Graduation Rate: Trends and Levels.” Review of Economics and Statistics, vol. 92, no. 2, 2010, pp. 244–262., doi:10.1162/rest.2010.12366.* 
   1. True grad rate is lower than widely used measures
   2. Grad rate peaked in the early 1970s
   3. Widening graduation differences by gender explain the increasing male-female college attendance gaps
3. *Lee, J.o., et al. “Mechanisms Linking High School Graduation to Health Disparities in Young Adulthood: a Longitudinal Analysis of the Role of Health Behaviours, Psychosocial Stressors, and Health Insurance.” Public Health, vol. 139, 2016, pp. 61–69., doi:10.1016/j.puhe.2016.06.010.* 
   1. Overview of how lower education rates are associated with worse health outcomes in young adults