



# Peer turnover and student achievement: Implications for classroom assignment policy



Marc Luppino\*

Federal Trade Commission, Bureau of Economics, 600 Pennsylvania Avenue, NW, H-238, Washington, DC 20580, USA

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## ABSTRACT

This paper examines the effect of peer turnover on academic achievement using random variation in classroom composition induced by Tennessee's Student Teacher Achievement Ratio (STAR) experiment. In central city school districts, I find that first graders benefit from greater peer turnover. Conversely, turnover is found to have a negative effect on young students in schools outside of central city districts. These results are consistent with a model of classroom learning in which the educational returns to having a stronger social network depend on neighborhood context. They suggest that a richer understanding of peer continuity effects is essential for designing optimal classroom assignment policies.

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## 1. Introduction

There is a large literature on the role of peers on student performance. While much of this has examined the role of student composition by race, gender, and ability, there has been surprisingly little about the role of consistency of peers. New classroom assignment at the onset of each grade means that a student's peer group regularly changes over an academic career. This is one of the first papers that attempts to estimate the effect of classmate turnover on student achievement.

Most research on turnover effects has arisen because of concerns over the consequences of student mobility. A 1994 study by the United States General Accounting Office found that slightly over 40% of children changed schools at least once between first and third grade. Student mobility, in turn, leads to high rates of classroom turnover. Alexander, Entwisle, and Dauber (1996) report that classroom turnover

of 50% or more during the school year is not unusual in many inner-city schools. High pupil turnover creates classroom management challenges for teachers. In particular, there is a tendency for teachers to respond to high student mobility rates by reducing their instructional pace to accommodate the variation and uncertainty in students' prior learning (Kerbow, 1996). Student mobility and turnover also leads to the breakup of peer groups which may increase students' adjustment problems (Temple & Reynolds, 1999).

Administrators and policymakers have limited scope to influence inward and outward school mobility, since this process is largely driven by parental choices. However, school administrators do have control over student mobility *within* schools. Classroom assignment decisions also generate peer turnover as students progress from grade to grade. Better understanding classmate turnover effects is essential for designing optimal classroom assignment policies, especially for young children.

In the United States, much of the research and policy debate on optimal classroom assignment centers on the merits of ability tracking (see Betts & Shkolnik, 1999). Conversely in Israel, education policy stresses peer continuity and the

\* Tel.: +1 2023262594; fax: +1 2023263443.

E-mail address: [mluppino@ftc.gov](mailto:mluppino@ftc.gov)

promotion of social capital (see [Katriel & Nesher, 1986](#)). Israeli first graders are arbitrarily assigned to classes. These initial class groupings are kept intact as students advance through all grades of elementary school. It is an open question as to how, if at all, these differing classroom assignment policies affect child development.

Because of the endogenous nature of school choice and school turnover rates, it is difficult to evaluate the consequences of peer turnover. There is a persistent concern that estimates of turnover effects, or externalities, are driven by omitted variable bias (e.g. that unobserved factors lead to both higher student turnover and worse academic performance and, therefore, generate spurious correlation between these two variables). Such concerns are still relevant when we shift focus to turnover induced by classroom assignment. To overcome these issues, this paper takes a unique approach. Specifically, I use random variation in classroom composition generated by Tennessee's Student Teacher Achievement Ratio (STAR) experiment to identify the causal effect of classmate turnover on student achievement.

Importantly for the purpose of the present study, all students participating in the STAR experiment who were initially assigned to regular size classes in kindergarten were again randomly assigned to regular size classrooms in first grade. This induced random variation within first grade classes in the percentage of children who previously shared the same class in kindergarten. Students assigned to a first grade classroom with a larger share of prior classmates experienced relatively less classmate turnover. In my analysis, I compare the performance of students who experience different rates of classmate turnover. To account for other potentially endogenous sources of variation in class composition, such as sample attrition or deviations from random assignment, I also control for kindergarten and first grade class fixed effects. Controlling for these classroom fixed effects also allows me to identify the effect of peer turnover net of any compositional changes in peer quality resulting from school mobility. Using the re-randomization and classroom fixed effects, I am able to identify the impact of classmate turnover on various student outcomes.

I find that classmate turnover has contrasting effects on student performance depending on school location. Outside of central city school districts, first graders perform better when they experience greater continuity in their peer group from grade to grade. Conversely, I find that turnover has a positive effect on students in central city school districts (whom are predominantly African-American and poor). My findings are robust to a number of alternative specifications and sample restrictions. These results are consistent with a model of classroom learning in which the educational returns to having a stronger social network depend on neighborhood context. Future research needs to further investigate the mechanisms by which peer turnover affects student achievement. The findings of this study suggest that a richer understanding of peer continuity effects is essential for designing optimal classroom assignment policies.

## 2. Related literature

The large literature on student mobility highlights the potential importance of classmate turnover. While most stud-

ies focus on how mobility affects movers, authors such as [Alexander et al. \(1996\)](#) and [Kerbow \(1996\)](#) raise the possibility that the turnover induced by student mobility may also affect non-movers. In particular, [Hanushek, Kain, and Rivkin \(2004\)](#) suggest that high student turnover can disrupt orderly teaching and curriculum development, imposing serious externalities from mobility.

While the present study examines the potential effects of student mobility *within* a school, there is a large related literature that investigates the effects of *between* school mobility on student outcomes. [Hanushek et al. \(2004\)](#) find that about a third of all students in Texas move at least once in elementary and middle school and that these moves adversely affect the academic performance of both movers and students in the receiving schools. [Gibbons and Telhaj \(2011\)](#) similarly find that student mobility leads to negative externalities in English primary schools. [Imberman, Kugler, and Sacerdote \(2012\)](#) examine the large influx of new students in Texas and Louisiana resulting from the Hurricane Katrina evacuation and find that it reduced the test scores of native students in those states. [Angrist and Lang \(2004\)](#) study the Metropolitan Council for Educational Opportunity (Metco), which introduced urban minorities into affluent suburban schools in the Boston area, and conversely find that this desegregation program had modest and short lived negative effects on suburban students.

One limitation of previous studies is that they do not disentangle the pure effect of turnover from any effects resulting from changes in the composition of peer quality. For example, the Hurricane Katrina evacuation introduced a large influx of new students into schools in Texas and Louisiana, potentially producing a turnover effect. In addition, the evacuee children came from some of the worst-performing schools in the country. As a result, we might expect them to have a negative peer effect on native students in the schools that received evacuee children. In the end, these types of "natural experiments" do not allow us to separately investigate these distinct effects. A key contribution of this paper is that I ensure identification of a pure turnover effect by controlling for classroom fixed effects, which directly account for changes in class peer composition.

Additionally because of the endogenous nature of student mobility, it is very difficult to identify how student turnover or integration at the school level affects learning. Potential endogeneity is also an issue when trying to identify the effect of peer turnover at the classroom level. Specifically, children with more family resources may systematically sort into smaller schools with fewer classrooms. In such schools, there would be less scope for classmate turnover. Unobservable parental inputs that drive this type of sorting are also likely to directly influence student outcomes and might otherwise bias estimates of the effect of classmate continuity. In order to avoid this problem, I take advantage of the randomized assignment of students to first grade classrooms conducted as part of the STAR experiment.

This is the first study to investigate the effect of classmate turnover on achievement using the Project STAR data. However, it joins a number of studies that use this experiment's randomization to investigate other aspects of educational production not directly related to class size (see, for example, [Dee, 2004](#); [Whitmore, 2005](#); [Graham, 2008](#); [Cascio and Whitmore-Schanzenbach, 2007](#); [Chetty et al.,](#)

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