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Power Play?

Teacher Characteristics and Class Assignments

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and Tara Béteille

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Abstract

While prior research has documented differences in the distribution of teacher characteristics across schools serving different student populations, few studies have examined how teacher sorting occurs within schools. Comparing teachers who teach in the same grade and school in a given year, the authors find less experienced, minority, and female teachers are assigned students with lower average prior achievement, more prior behavioral problems, and lower prior attendance rates than their more experienced, white and male colleagues. Though more effective (higher value-added) teachers and those with advanced degrees are also assigned less difficult classes, controlling for these factors does not eliminate the association between experience, race, gender, and assignments. The authors hypothesize that this pattern of class assignments results, in part, from power relations among teachers within a school, a process that works to disadvantage those with less experience and from minority and female backgrounds, as well as from parental pressures. These patterns have negative implications for teacher retention given the importance of working conditions for teachers' career decisions.

Introduction

The literature on effective schools emphasizes the importance of a quality teaching force in improving educational outcomes for students (Brewer 1993; Mortimore 1993; Sammons, Hillman, and Mortimore 1995; Taylor, Pearson, Clark, and Walpole 2000). The effect of teachers on student achievement is particularly well established (Nye, Konstantopoulos, and Hedges 2004; Rivkin, Hanushek, and Kain 2005; Rockoff 2004). However, teachers are not randomly assigned to schools or students. Many prior studies have documented the ways in which the teacher labor market works to disadvantage urban schools (Boyd, Lankford, Loeb, and Wyckoff 2005a; Hanushek, Kain, and Rivkin 2004; Lankford, Loeb, and Wyckoff 2002). These schools often face difficulty attracting and retaining effective teachers (Ferguson 1998; Krei 1998; Lankford, Loeb, and Wyckoff 2002). Between-school sorting disadvantages schools with high concentrations of low-income, minority, and low-achieving students. Students from such backgrounds are less likely to be exposed to experienced and highly qualified teachers compared to their more advantaged counterparts attending other schools.

Less clear from prior research, however, is the extent to which the systematic matching of teachers to students also occurs within schools. In this paper we present a comprehensive analysis of teacher assignments in a large urban school district. We examine the relationships between teacher characteristics and classroom assignments and whether school-level factors moderate these associations. Our analyses focus on differences in classroom assignments among teachers who teach the same grade in the same school in a given year. We find that teachers' human capital—measured by their highest degree, experience, and effectiveness in raising student achievement—is a consistent predictor of the types of students they are assigned. This pattern may result from a strategic effort on the part of school leaders to retain their most competent employees. We also find that less experienced, minority, and female teachers

are assigned more challenging classes than their colleagues at their school. The results are consistent across a wide range of class characteristics and at both the elementary and middle and high school levels. Controlling for teacher differences in our measures of human capital does not mediate the relationship between teacher experience, race, gender and class assignments.

We posit that the relationships between experience, race, gender and class assignments we document are driven, in part, by power relations among teachers and school leaders, though pressures from parents to have their children matched with certain teachers may also contribute to the patterns. Assignments may be influenced by informal network ties among teachers and relationships with school leaders which could serve to advantage more experienced teachers, white or male teachers. For example, more experienced teachers have more power within schools and more knowledge about how the assignment process occurs, making it easier for them to have their preferences met when it comes to the students they are assigned. Prior qualitative research suggests that more senior teachers closely guard the most desirable courses and often exclude new teachers from the class assignment process (Finley 1984; Monk 1987). Consistent with this argument, we find that new teachers receive the most challenging class assignments when they work in schools with more experienced colleagues. Novice teachers receive particularly challenging assignments when they work in schools with more senior colleagues and when there is more stability among the senior teaching force at a school. Presumably, it is in such contexts that new teachers have the least power, and that networks and relationships among more experienced teachers are especially strong.

Some of the relationship between class assignments and race that we observe may be due to black and Hispanic teachers' preferences for or superior effectiveness with minority students and lowincome students, as suggested by prior research (Dee 2005; Downey and Pribesh 2004; Mueller, Finley, Iverson,

and Price 1999). However, we also find that black and Hispanic teachers are assigned lower achieving students with more behavioral problems even after we control for the racial makeup of their classes. The assignment of black and Hispanic teachers to more challenging classes is especially prevalent when schools have more white teachers and when schools are led by a white principal. This finding is consistent with a wide body of literature on racial differences in job rewards within work organizations. Minorities' often receive more challenging job assignments, fewer promotion opportunities, or less favorable evaluation from supervisors, particularly when their supervisor is white (Greenhaus, Parasuraman, and Wormley 1990; Kanter 1977; Tsui and O'Reilly 1989).

The patterns of assignment we document are likely to be harmful for both teachers and students. Prior research suggests that teachers are more likely to leave their school when they receive more challenging class assignments (Donaldson and Johnson 2010; Feng 2010) and that students learn less in years they are assigned novice teachers (Clotfelter, Ladd, and Vigdor 2006; Murnane and Phillips 1981; Nye, Konstantopoulos, and Hedges 2004; Rockoff 2004). The assignment of less experienced teachers to more black, low-income, and low achieving students is likely to exacerbate within school achievement gaps given that new teachers are less effective in raising student achievement than their more experienced counterparts. Within school sorting may undermine policy interventions aimed at reducing the uneven distribution of highly qualified and experienced teachers across schools. Some policies, for example, may offer financial incentives for teachers to enter or stay in harder to staff schools (Hough and Loeb 2009). Such policies will not be as effective as intended if the most experienced or effective teachers in these schools are assigned to the relatively least disadvantaged or highest achieving students. Within school sorting may prevent the most effective teachers from being matched to students who need them most even if the sorting of teachers between schools is minimized.

Background

Prior Research on Teacher Sorting

Many studies suggest that teachers prefer teaching in schools with easier to serve student populations. When given the opportunity, more qualified and experienced teachers tend to sort into schools with higher achieving students, fewer minority students, higher income students, and schools that are safer and experience fewer disciplinary problems (Boyd, Lankford, Loeb, and Wyckoff 2005b; Clotfelter, Ladd, and Vigdor 2006; Hanushek, Kain, and Rivkin 2004; Horng 2009; Jackson 2009; Lankford, Loeb, and Wyckoff 2002; Scafidi, Sjoquist, and Stinebrickner 2008; Smith and Ingersoll 2004). Schools with harder to serve student bodies generally face the burden of high teacher turnover (Allensworth, Ponisciak, and Mazzeo 2009; Boyd, Grossman, Ing, Lankford, Loeb, and Wyckoff 2009; Ingersoll 2001).

In contrast to the literature that describes how teachers sort between schools, there is comparatively little research on the extent to which sorting also occurs within schools. There is a large body of literature on the sorting of students within schools, much of which comes from research on tracking and ability grouping. This research provides clear evidence that students are sorted to different types of peers (i.e., based on academic ability or race) and curricula within schools, especially at the middle and high school levels (Conger 2005; Gamoran 1987; Oakes 1985). The practice of ability grouping creates considerable variation in the average achievement levels of classrooms within schools (Gamoran 1993; National Education Association 1990), and also contributes to racial or socioeconomic segregation within schools since minority and low-income students tend to have lower achievement (Gamoran 1987; Lucas and Berends 2002; Oakes 1985; Oakes and Guiton 1995). This body of research suggests that there are potentially large differences in student characteristics across classrooms within schools; however, less clear is the extent to which there is systematic sorting of teachers with different characteristics to courses that serve students of different abilities. The extent to which teacher and student sorting also occurs at the

elementary school level (where tracking and ability grouping are less common) also remains unclear.

One reason for the relatively small body of research on the sorting of teachers to students within schools lies in data limitations; most datasets do not link individual teachers to specific students. Even when it has been possible to link individual teachers to the students they teach, prior studies investigating within school sorting have often been more interested in the potential for this sorting to bias other estimates, such as teacher value added or the relationship between teacher characteristics and student achievement (Clotfelter, Ladd, and Vigdor 2006; Rothstein 2009; Rothstein 2010). These studies have not taken a substantive interest in the causes or consequences of sorting.

There are few large scale studies that have investigated whether certain types of teachers are assigned more challenging students. A study of 7th grade students in North Carolina in 2000 found that black students are disproportionally assigned to novice teachers as the result of both within and between school sorting (Clotfelter, Ladd, and Vigdor 2004). A recent study of schools in Florida found that novice teachers are assigned more disadvantaged students than their colleagues, including more minority and low-income students as well as those with behavioral problems (Feng 2010). A study of high school teachers in an urban school district in 2000 found that new teachers to a school are disproportionately assigned more ninth grade students than their more experienced colleagues (Neild and Farley-Ripple 2008). Finally, Kelly (2004) uses nationally representative data and finds that teachers with more seniority and experience are more likely to teach higher level courses at the high school level. However, he is only able to examine courses taught and not the characteristics of students in those courses. There are also some qualitative studies have found that better or more experienced teachers are often assigned to high-track classes in high schools (Finley 1984; Oakes 1985). We build on these studies by examining a wider range of teacher and student characteristics, a wider range of grades and years, and variation in the assignment process across schools

with different characteristics.

Factors Contributing to the Assignment Process

The allocation of teachers to students is likely to result from a complex process whereby principals and other school leaders attempt to balance short and long term goals while responding to pressures to meet the preferences of teachers, students, and parents. Though the data employed in this study do not allow us to fully examine all the factors underlying the assignment process, we are able to investigate two hypotheses that could explain the relationship between teacher characteristics and class assignments. First, teachers with more skill or experience may receive better class assignments. Principals may use assignments as a means of retaining their best teachers or of indirectly encouraging the departure of their least effective teachers. Second, assignments may result from power relations within schools that work to the benefit of more experienced, white, or male teachers.

We also expect that parents may play some role in the assignment process. In particular, middle and upper class parents may try to intervene in the class assignment process to ensure that their child is taught by who they believe to be the most desirable teacher (Lareau 1987; 2000). Though many principals are resistant to such efforts on the part of parents, there is some evidence that parents are often successful in influencing to which teachers their students are assigned (Clotfelter, Ladd, and Vidgor 2008; Monk 1987).[1]

In most cases, organizations prefer to retain their most effective employees and will often offer benefits such as higher compensation and/or promotions in an effort to do so (Abelson and Baysinger 1984). Rewarding effective employees may be challenging in the educational context, however, given

[1] Unfortunately, we do not have any data that permit an examination of the role of parent preferences on the assignment process.

rigidities of salary schedules and limited vertical differentiation of jobs within schools (Becker 1952). In lieu of salary increases or promotions (over which principals may have little control), principals may give their best teachers the most desirable class assignments as a retention strategy. Teachers typically value specific course assignments relative to others, in terms of subject, grade, and average student ability level of the students they enroll (Donaldson and Johnson 2010; Finley 1984; Neild and FarleyRipple 2008). Teachers who transfer schools often cite challenging assignments or feelings of inadequacy over assignments that do not match their skill set as key reasons for moving (Donaldson and Johnson 2010; Ingersoll 2004; Marvel, Lyter, Peltola, Strizek, Morton, and Rowland 2007).

A recent qualitative study in ten Florida elementary schools found that principals sometimes give highly effective teachers classes of their choosing, though effectiveness was only one of many factors that principals considered when matching teachers to classes (Cohen-Vogel and Osborne-Lampkin 2007). In our own survey of principals in the district we study in this paper, about 28 percent of principals indicated that they reward good teachers with their desired class assignments in hopes of retaining them.[2] As a corollary, assignments may also be used as sanctions in an effort to remove less effective teachers. Collective bargaining agreements make it difficult for principals to remove teachers. The assignment of challenging classes may be an indirect means of encouraging poorly performing teachers to leave.

A second explanation for the relationship between experience and assignments has to do with informal power relations within schools that may assist certain types of teachers in receiving their desired courses. In particular, such informal processes may work to the disadvantage of less experienced, minority and female teachers. In an ethnographic study of tracking in a high school, Finley (1984) found that more senior teachers closely guarded the most desirable courses such as advanced placement or electives (which tend to enroll higher achieving students) (Finley 1984). These high track classes were generally taught by

[2] Survey administered to principals in the Miami¬Dade County School District during the spring of 2010.

the same teacher every year and changes in ownership of these courses happened informally. While teachers in her study guarded the advanced courses, they agreed to share the remedial courses. This benefit, however, was not shared with new teachers who only taught low-track classes initially. New teachers in Finley's (1984) study continued to receive challenging schedules until they asserted themselves and made friends in the department. Administrators justified assigning new teachers to lower-track classes by arguing that they needed time to improve their teaching skills before being qualified to teach the advanced courses effectively.

Power relations within schools may also result in female and minority teachers receiving more challenging assignments. Prior research suggests that minority and female employees often face discrimination on the job which occurs when minorities receive fewer rewards, resources or opportunities than they deserve based on their performance (Greenhaus, Parasuraman, and Wormley 1990). This type of discrimination can effect tangible outcomes such as position assignments, training opportunities, salary increases, promotions and also more subtle social-psychological outcomes such as acceptance in a work group or career support from colleagues or supervisors (Greenhaus, Parasuraman, and Wormley 1990). This discrimination need not be overt or intentional but may result from more informal social processes within organizations. Kanter (1977) argues that minorities and women often have less access to opportunity and power in organizations in part through their exclusion from informal social networks. Such exclusion from informal networks can limit their ability to influence organizational processes or stunt their opportunities for career growth (Kanter 1977).

Like all groups, those in power tend to prefer others like themselves. Because whites and males generally hold positions of authority in organizations, they benefit most from this in-group preference. This generates a process termed "homo-social reproduction" by Kanter (1977) whereby minorities within an

organization often do not receive the same types of job rewards as their white or male colleagues.

In summary, relatively little prior research has investigated the sorting of teachers to different types of students within schools. Systematic sorting may occur through a variety of mechanisms such as a desire to reward the most skilled or experienced teachers or sanction poorly performing ones and power relations within schools. In this paper we provide a comprehensive analysis of teacher assignments, examining which types of teachers receive more challenging students and whether there is variation in the assignment process across schools with different characteristics.

Data

To examine patterns of class assignment we use data from administrative files on all staff, students and schools in the Miami-Dade County Public School (MDCPS) district from the 2003-04 through the 2008-09 school years. The school district we study, MDCPS, is the largest public school district in Florida and the fourth largest in the United States, trailing only New York City, Los Angeles Unified, and the City of Chicago School District. In 2008, MDCPS enrolled almost 352,000 students, more than 200,000 of whom were Hispanic. Nearly 90 percent of students in the district are either black or Hispanic and 60 percent qualify for free or reduced priced lunches.

The data used for our analyses come from three different files provided by the district: test score and basic demographic information for all students in the district, course-level data that link students to each of their teachers in each year, and a staff-level file with information on all district employees. The student-level files include student race, gender, free/reduced price lunch eligibility, number of times the student was absent that year, and the number of days the student missed school due to suspensions that year. The test score data include math and reading scores from the Florida Comprehensive Assessment Test (FCAT). The FCAT is given in math and reading to students in grades 3–10. It is also given in writing and

science to a subset of grades, though we only use math and reading tests in our analyses. The FCAT includes criterion referenced tests measuring selected benchmarks from the Sunshine State Standards (SSS). We standardize students' test scores to have a mean of zero and a standard deviation of one within each grade and school-year.

We construct a data base with one observation for each teacher in each year with the characteristics of students in their class. We start with course-level student data which lists the unique identifier for the teacher of each course in which a student enrolled. We then add student characteristics and test scores to this course-level file before collapsing it to the teacher level, computing the proportion of students from different demographic backgrounds (i.e., by race and poverty level) and the mean of the one-year lag of time-varying achievement (i.e., test scores, test proficiency levels, student grade retention) and behavioral outcomes (i.e., absences and suspensions). We also compute the standard deviation of students' lagged test scores since having a class with students of more variable ability levels is likely to be challenging for teachers. Finally, we construct a dichotomous variable indicating whether the teacher has students enrolled in multiple grades in a given year. To this class-level data we add various teacher characteristics from the MDCPS staff database which includes demographic measures, prior experience in the district, current position, and highest degree earned for all district staff from the 2003-04 through the 2008-09 school years.

In addition to these administrative data, we also use data from a survey of teachers we conducted in MDCPS in the spring of 2008. We received survey responses from nearly 16,000 of the 19,000 teachers in the district for a response rate of about 83 percent. The survey provides additional information on the characteristics of teachers that may be associated with the types of students they are assigned but that are unavailable in the administrative data. We asked teachers about previous leadership positions they held in

their school. Specifically, we examine whether teachers who were ever a grade or department head, a member of school-wide leadership team, or a professional development leader receive more desirable class assignments than their colleagues who have not held such positions. Our survey also asked teachers which undergraduate college they attended. In the absence of teacher test scores or some other measure of "ability", we instead create measures of the selectivity of teachers' undergraduate institutions to serve as a rough proxy for this information. Teachers entered the name of their undergraduate institution which we matched by hand to the identifier used for each school by the Integrated Postsecondary Education Data System maintained by the National Center for Education Statistics. After assigning each college the appropriate identification code, we combine our survey data with other information about the colleges teachers attended. We use the acceptance rate of teachers' undergraduate institution and the 75th percentile of SAT/ACT scores from their undergraduate institution.[3]

Since we do not know in which year teachers entered college, we use IPEDS data from a recent year (2007). Finally, we use the survey data to distinguish school specific experience from total experience in the district. School specific experience is not available in the administrative data but was included on our survey instrument. Given our hypothesis about the role of power in influencing class assignments, we expect that experience at a particular school will be more strongly related to assignments than will experience at other schools.

Table 1 lists the mean and standard deviations of variables used in our analyses. There are over 100,000 observations for teachers over the six year span of our data with about 75 percent of these teachers teaching classes of students who were tested in the prior year. They average about 10 years of

[3] IPEDS collected data on the SAT and ACT scores of students at the 25th and 75th percentiles of the college's incoming freshmen class. Since these measures correlate at about .91, we only use the 75th percentile measure. For schools that report SAT scores, we take the sum of verbal and mathematics scores at the 75th percentile. If schools reported ACT composite scores, we convert those scores to their SAT score equivalents based on an equivalency table published by the College Board (see: http: //professionals.collegeboard.com/profdownload/act-sat-concordancetables. pdf).

experience in the district with 20 percent of observations being from first or second year teachers. Teachers in the district are predominately female (76 percent), 43 percent are Hispanic, 27 percent are black and 40 percent have a master's degree. There are a total of 2.14 million student observations over the 6 years (595105 unique students) and 1.24 million observations with student test scores (451484 unique students). Nearly 90 percent of students in the district are black (27 percent) or Hispanic (60 percent) and more than 60 percent qualify for free/reduced priced lunches. Nine percent of students missed school 21 or more days in the prior year and 7 percent of students were suspended at least once.

Methods

Our analysis has two primary components. First, we examine the relationship between teacher characteristics (i.e., experience, race, gender, highest degree, effectiveness in raising student achievement) and class assignments. Second, we investigate whether there is variation in the magnitude of these relationships in different types of schools. We evaluate the extent to which average teacher experience, presence of senior teachers, stability of the senior teaching force, and the racial composition of teachers and principals at the school moderate the relationships we observe among teacher characteristics and assignments.

Teacher Characteristics and Class Assignments

In the first set of analyses we examine differences in the attributes of students assigned to teachers with varying experience levels and demographic characteristics. The following equation describes the model:

$$Y_{itsg} = \beta_0 + \beta_1 (Experience)_{itsg} + T_{itsg}\beta_2 + \pi_{stg} + \varepsilon_{itsg} \quad (1)$$

We predict a class characteristic for teacher *i* in year *t* in school *s* and in grade *g*, Y_{itsg}, as a function of teacher experience; teacher background measures (race, gender, age highest degree earned), T_{itsg} , and a school by year by grade fixed effect, π_{stg} . Our outcomes include a wide range of class characteristics that describe the class a teacher inherits: average lagged student achievement in math and reading, standard deviation of lagged math and reading achievement, proportion of students scoring in highest and lowest FCAT proficiency levels in the prior year, proportion of students repeating the grade, proportion of students suspended the prior year, proportion of students chronically absent[4] the prior year, whether the teacher has students in more than one grade, the proportion black, and the proportion receiving free/reduced priced lunches. Since the majority of students in this district are Hispanic, we only examine assignment to black students and not to Hispanic students. We estimate the models shown by Equation 1 for all teachers. We also conduct a similar set of analyses restricted to high school teachers where we examine assignments to advanced placement (AP)/honors courses and assignments to ninth and twelfth grade students. Our models that include the survey items are similar except that they are only estimated for 2008 and they include a school fixed effect (instead of a school by year by grade fixed effect) since we only have survey data from one year.

We use two different measures of teacher experience in our analysis. The first is a measure of whether the teacher is a novice, defined as someone in their first or second year employed by the district. The second is a continuous measure capturing years of teaching experience in the district. The estimate β_1 shows the difference in the attributes of the students assigned to novice versus more experienced teachers or the expected change in a class characteristic given a one year increase in teacher experience.

[4] In their annual "school indicators" report the state of Florida classifies students as chronically absent if they miss 21 or more days of school in a given year. This is the definition we use here. Being absent this frequently constitutes missing more than 10 percent of a school year.

Similarly, the vector of coefficients in β_2 show the difference in the attributes of the students assigned to teachers of different race, gender, and educational backgrounds. Our inclusion of the school by year by grade fixed effect means that our estimates reflect differences in class assignments for teachers of varying experience or demographic characteristics teaching the same grade and in the same school in the same year.

In a subsequent set of models we add (lagged) teacher value added to **Equation 1**. Doing so allows us to examine the relationship between teacher effectiveness and class assignments and whether effectiveness mediates the association between teacher experience, demographic characteristics, and class assignments. Briefly, we compute teacher value added by predicting a student achievement gain as a function of time-varying student characteristics, school characteristics, a student fixed effect, and a teacher by year fixed effect. The teacher by year fixed effect, which we shrink to account for measurement error using the empirical Bayes method, is our measure of value added. We present a complete description of the value-added estimation in **Appendix A**.

Next, we examine whether there are features of the faculty and leadership in schools that moderate the relationship between teacher characteristics and class assignments. We include four different sets of interactions between school and teacher characteristics. First, we interact teacher experience with the average experience of other teachers in the school (computed by excluding the teacher of interest). We anticipate that less experienced teachers might receive the most challenging assignments when they are in schools with more experienced teachers. The tenure of experienced teachers at a given school may also influence the assignment of novice teachers. With a second set of interactions, we interact a novice teacher indicator with the retention rate for non-novice teachers in a grade at a school over a one year time-period. Novice teachers may receive the most challenging assignments when there is more stability among

experienced teachers at their grade and school. Third, we suspect that new teachers might receive particularly challenging assignments when there are more very experienced teachers at their school. We therefore interact the novice teacher indicator with the proportion of teachers at a school that have more than 10 years of experience. Finally, we interact teacher race with the race of their principal and with the percentage of white teachers at the school. Given tendencies toward racial homophily, we expect that friendships and social ties among teachers and principals may occur along racial lines. To the extent that class assignments partially result through informal processes, black and Hispanic teachers in schools led by white principals or with more white teachers may be assigned particularly difficult classes.

Results

Teacher Experience and Class Assignments

We begin by examining the relationship between teacher experience and class assignments. In **Table 2** we present the results from estimating **Equation 1** for each of the class characteristics. **Models 1 and 2** examine differences in class assignments between novice and more experienced teachers while **models 3 and 4** examine the relationship between a continuous measure of teacher experience and assignments. **Models 2 and 4** include a school by year by grade fixed effect while **models 1 and 3** exclude it for comparison purposes. **Models 1 and 3** are included to show the relationship between teacher and student characteristics prior to removing the part of those associations due to between school sorting. **Models 2 and 4** remove the part of these associations due to differences between schools and are of primary interest. The results from these analyses are very consistent: novice teachers have classes made up of students with lower average achievement, more behavioral problems (suspensions), poorer attendance, more students repeating a grade, more black students and more low-income students.

For example, if we look at models that exclude fixed effects (**model 1**), novice teachers have students who scored about a tenth of a standard deviation lower on the math test in the prior year. This is consistent with prior research, but much of this relationship is due to the differential distribution of novice teachers across schools serving different student populations. In **model 2**, where comparisons are made between novice and more experienced teachers teaching the same grade in the same school, we continue to observe a similar pattern though the estimates are a bit smaller. Within schools and grades, novice teachers' students score about one twentieth of a standard deviation lower in math in the prior year compared to the students of more experienced teachers in the school. The size of the effect is similar for reading achievement.

For the behavioral outcomes we find that novice teachers are assigned more students who were suspended or chronically absent in the prior year. Within schools novice teachers also receive about one percent more black students and low-income students relative to their more experienced colleagues. We find similar significant relationships between our continuous measures of teacher experience and class assignments. In analysis not shown we also find a similar relationship between teacher experience and class assignments in models with teacher fixed effects. Although new teachers may receive more challenging assignments initially, these models suggest that their assignments improve with more experience.

In **Figures 1 and 2** we further illustrate these results by plotting the relationship between teacher experience and average class achievement. **Figures 1 and 2** show the relationship between teacher experience and prior achievement in elementary schools and in middle/high schools. We present the figures separately by grade level since tracking and ability grouping are more common at the middle and high school levels compared to the elementary school level. Greater within school sorting of students with different characteristics across classrooms may allow for more sorting of teachers to different types of

students. In these figures teacher experience is plotted on the x-axis and the difference in a given class characteristic between first-year and more experienced teachers is plotted on the y-axis. The models used to generate these graphs are similar to those shown in **Table 2** in that they include controls for teacher demographics and a school-by-year-by-grade fixed effect. However, they allow the relationship between teacher experience and the average prior achievement of teachers' students to be nonlinear with experience entered as dummy variables (top coded at 21 or more years of experience) with first-year teachers serving as the comparison group. The error bars on the graphs represent the 95 percent confidence intervals.

These figures show that teachers with about two to seven years of experience have students with slightly higher—though not statistically significant—prior achievement compared to their first-year colleagues at both the elementary (**Figure 1**) and middle/high school levels (**Figure 2**). However, teachers with 10 to 20 years of experience have students with average prior achievement that is .10 to .20 standard deviations higher relative to their first-year colleagues. The pattern is similar at the elementary and middle/high school levels though the effects at the top end of the experience distribution are a bit larger at the middle/high school levels than they are at the elementary school level. The patterns we show in these figures for the achievement outcomes are evident across all the outcomes we show in **Table 2**.[5]

[5] In results not shown we replicated all the analysis shown in Table 2 separately by grade level and by schools' performance in the state's accountability system. We find similar results regarding the assignment of novice teachers to more challenging classes across elementary, middle, and high schools and across high and low performing schools. We also replicated the results in Table 2 separately by subject taught among middle and high school teachers. When looking at all middle and high school teachers we find results similar in magnitude to those shown in Table 2. Novice math and science teachers, however, appear to be assigned especially challenging classes. Their students score between .15 and .20 standard deviations lower in the prior year compared to the students of their more experienced colleagues in their department at their school. The differences in other class characteristics are also generally larger for novice math and science teachers as well. There is often special concern over recruiting and retaining teachers from these harder to staff subjects. Assigning novice teachers in these subjects to lower achieving students than their peers is unlikely to help in this vein.

If the relationship between teacher experience and class assignment is due to power differentials, then a teacher's experience at a particular school should be more strongly related to their assignments than their experience outside of their current school. In **Table 3**, we distinguish between teachers' experience at their current school from experience at other schools in the district. Although we estimate these models for all of the outcomes that appear in **Table 2**, we only show results for select outcomes in Table 3 and all subsequent tables for the sake of brevity. We find that only school specific experience is associated with class assignments. Note that these analyses are restricted to teachers who responded to our 2008 survey, where we asked about school specific experience.

Other Teacher Characteristics and Class Assignments

In **Table 4** we show estimates of the relationship between teacher gender, race, highest degree, and class assignment for all teachers in the district. These results suggest that female, black, and Hispanic teachers are assigned lower achieving students and more low-income students than their male and white counterparts in the same school. Black and Hispanic teachers are also assigned classes of students with more variable prior achievement. Black teachers also have more black students in their classes and more students who were suspended in the prior year. There is also some evidence that teachers with master's degrees get different class assignments than their counterparts with a bachelor's degree only—they receive a lower proportion of students with disciplinary problems in the prior year, fewer low-income students and fewer black students. The significant relationships between teacher race and assignment to lower achieving students with more behavioral problems generally remain even after controlling for the racial makeup of teachers' classrooms in **model 3**.

Class assignments may be used as a reward for more effective teachers. If so, differences in effectiveness might mediate some of the relationships among teacher characteristics and class assignments. **Table 5** examines this hypothesis. The models are similar to those shown in **Table 4** but also include controls for teacher value added (measured in the prior year) as well as the lag of the outcome. We include the lag of the outcome because we worry that there may be a correlation between teacher value added and prior assignments on the one hand and between prior assignments and current assignments on the other hand. Also note that these models can only be estimated for the subset of observations of teachers who taught students tested in reading or math in the current and prior year. One additional year of data is excluded given our use of the lags. For most of the outcomes we find that there are few gender differences in assignments for this sample of teachers for whom we were able to estimate value added. The results for race, experience and highest degree are similar for this sample of teachers compared to the results for all teachers shown in **Table 4**. **Model 3** presents the full model with measures of teacher value added and the lag of the outcome.

The estimates from these models suggest two main findings. First, controlling for prior teacher value added does not explain the association between teacher race, highest degree, experience and class assignments. It does mediate some of these relationships to an extent—especially for teachers with a master's degree—but less experienced and minority teachers continue to receive more challenging students in their classes even when controlling for their prior effectiveness. Second, teacher value added is a consistently significant predictor of class assignments. Teachers who were more effective in the prior year tend to get students with higher average achievement, with less variable achievement, and fewer students who were chronically absent or suspended in the prior year. They also have fewer black and low-income students in their classes. For example, a one standard deviation increase in teacher value added is

associated with an increase of about one-tenth of a standard deviation in their students' prior math scores. These results suggest that easier class assignments might be used to reward more effective teachers. Even net of prior effectiveness, however, less experienced and minority teachers continue to receive more challenging students in their classes.

In **Table 6** we examine the 2008 assignments of teachers who responded to our survey. Here we find that teachers who currently or previously held school leadership positions and those who attended undergraduate institutions with higher admissions test scores are assigned higher achieving students and those with fewer behavioral and attendance problems. For example, teachers who ever served as a professional development leader are assigned students whose prior achievement in math and reading is more than one-tenth of a standard deviation higher than the students assigned to their colleagues at their school (controlling for other teacher characteristics including experience). The results are similar though a bit smaller in magnitude for teachers who ever served as a grade or department head and for teachers who were ever members of a school leadership team. Similarly, a one-hundred point increase in the 75th percentile of SAT scores of teachers' undergraduate institution is associated with about a 0.04 increase in the math and reading achievement of the students in their classes.

Class Assignments among High School Teachers

In **Table 7** we examine assignment to AP/honors courses and to ninth and twelfth grade students among high school teachers. Instead of using a school by year by grade fixed effect as in the prior analyses, these models use a school by year by subject fixed effect. These models are consistent with the other results discussed thus far. Novice teachers are assigned about 5 percent fewer AP/honors courses, 5 percent more ninth grade students and 5 percent fewer twelfth grade students than their more experienced colleagues in

their department at their school. The relationship between teacher experience and assignment to advanced courses and ninth and twelfth grade students is also shown in **Figure 3**. Black and Hispanic teachers are also assigned fewer AP/honors courses, more ninth grade students and fewer twelfth grade students than their white colleagues. While female teachers are assigned more AP/honors courses than their male colleagues, they are also assigned more ninth and fewer twelfth grade students. We find similar results when we examine individual subjects separately (not shown). Therefore, more experienced and white high school teachers receive what are generally thought of as the most desirable courses to teach and students who are older and more mature.

Variation in Assignments across Schools

Next, we examine whether the relationship between teacher experience, race and class assignments varies among schools with different faculty and principal characteristics. We hypothesize that class assignments may result, in part, from power relations among teachers within schools. Such a process may serve to disadvantage minority or less experienced teachers who may have less power and less connected social networks. We conduct four sets of analyses to further investigate this idea.

First, we replicate the models shown in **Table 2** but add interactions between a teacher's own experience and the average experience of other teachers at their school. The results are shown in Table 8. We standardized the average teacher experience at the school to have a mean of 0 and a standard deviation of 1 to aid interpretation. Though the interactions between novice teacher and average teacher experience at the school are generally not significant, the interactions between our continuous measure of teacher experience and average experience in the school are consistently significant. For example, the main effect on teacher experience in model 4 shows that a one year increase in teacher experience is associated

with a 0.011 standard deviation increase in the prior math and reading achievement of teachers' students in schools with average levels of teacher experience. Each standard deviation increase in average teacher experience at a school strengthens this relationship by 0.001 standard deviations. The results from these interaction models suggest that more experienced teachers get even better assignments when they are employed in schools with higher average teacher experience. Therefore, less experienced teachers receive particularly challenging classes when they work in schools with more experienced colleagues.

Second, we replicate the models shown in **Table 2** but add interactions between a novice teacher indicator and the retention rate of non-novice teachers in a grade at a school. The retention rate of non-novice teachers is computed as the proportion of teachers with more than two years of experience in a grade at a school who were teaching the same grade at the same school 1 year ago. In similar models, we add interactions between a novice teacher indicator and the proportion of teachers at a school with more than 10 years of experience. The results from these analyses are shown in **Table 9**.

Novice teachers receive the most challenging classes when there is more stability among their more senior colleagues. As an example, consider **model 1** in the first panel of **Table 9** which shows the average prior math achievement of teachers' students. The main effect on the novice teacher indicator is close to zero and not statistically significant. This suggests that novice teachers in school-grades where none of the non-novice teachers were present 1 year ago are not assigned students with lower average prior math achievement in the current year. However, in schools where all of the non-novice teachers were present 1 year ago novice teachers are assigned students whose prior math achievement is about .10 of a standard deviation lower than the students assigned to their more experienced colleagues. The results are consistent across the other achievement models shown in Table 9 but not significant for the behavioral outcomes (i.e., suspensions and absences) or for student race and poverty-level (not shown). Therefore, novice teachers

are assigned higher achieving students when their schools experience less stability among non-novice teachers. The results are similar when we include interactions with the proportion of senior teachers at a school. For example, the main effect on novice teacher in **model 2** suggests that novice teachers do not receive lower achieving students when their school does not have any senior teachers. When all of their colleagues are senior, then novice teachers are assigned students whose prior achievement is about a tenth of a standard deviation or more lower than their colleagues.

In a final set of interaction models, we replicate the models shown in Table 4 but add interactions between teacher race and both the race of their principal and the percentage of teachers at their school that are white. The results are shown in Table 10. Model 1 includes interactions between teacher race and principal race. For math achievement, the results suggest that when black teachers' schools are led by non-white principals they are assigned students with average achievement that is about one-tenth of a standard deviation lower relative to their white colleagues in the same school. However, when black teachers' schools are led by white principals this differential is about .14 standard deviations.

The results are similar in magnitude for reading achievement though the interaction term is not statistically significant (not shown). We do not find a similar differential effect for Hispanic teachers when schools are led by white principals. Though the interactions between teacher and principal race are not significant for the behavioral outcomes, we do find that both black and Hispanic teachers are assigned more grade repeaters and low-income students when their schools are led by white principals. For example, black and Hispanic teachers are assigned about 1 percent more low-income students than their white colleagues when their schools are led by a minority principal (as shown by the main effect on teacher race). But when their schools are led by a white principal they are assigned about 2 percent more low-income students than their white colleagues. Black teachers are also assigned more black students when their schools are led by

white principals.

In **model 2** we remove the interaction between teacher and principal race and add an interaction between teacher race and the proportion of teachers at the school that are white. Here we find fairly consistent evidence that black teachers receive the most challenging assignments when they have more white colleagues. The results are less consistent for Hispanic teachers but we do find that Hispanic teachers are assigned more black students, more low-income students, more grade repeaters, and students of more variable prior achievement when their school has more white teachers. When we include both sets of interaction terms in model 3 we find, for the most part, that the interactions between teacher race and the racial composition of the other teachers at the school remain significant while the interactions between teacher and principal race are reduced in magnitude and are no longer significant.

There are likely to be other features of schools that influence class assignments. In particular, we hypothesized that principals would play an important role in the assignment process, as prior evidence suggests. For example, seventy-five percent of public school principals in a national study reported that they played a large role in determining teacher class placements (Carey and Farris 1994). In analyses not shown, we examine several characteristics of principals to see whether the assignment of less experienced teachers to more challenging students happens to a greater or lesser extent schools led by different types of principals. The principal characteristics we examined include: overall years of principal experience; years of service as principal at the current school; the principal's highest degree; and several scales based on principal self-reports of their effectiveness across several domains from surveys we conducted.[6] We estimated models similar to those shown in **Table 2** with the inclusion of interactions between each of these principal characteristics and teacher experience. Such an analysis allows us to gauge whether assignment by teacher experience happens more evenly in schools led by different types of principals. We

[6] For details on our survey and construction of principal self-reported effectiveness scales see Author (2010).

find little evidence that any of these characteristics of principals moderate the relationship between teacher experience and class assignments. This does not necessarily mean that principals play no role in the assignment process. Rather, it suggests that principals with different (observable) characteristics employ similar practices when assigning novice teachers.

Conclusion

In this paper we studied the pattern of teacher-student matching within schools in a large urban school district. We examined the relationship between teacher characteristics and receipt of challenging students and variation in patterns of teacher-student matching across schools with different characteristics. We find a great deal of unevenness in class assignments whereby some teachers systematically receive more challenging students in their classes compared to their colleagues.

Teachers' human capital—measured by their experience, highest degree earned, attendance at more competitive colleges, and effectiveness in raising student achievement— is consistently related to the types of students they are assigned. These results may be influenced by the desire of principals to reward teachers that they wish to retain or to sanction teachers that they wish to remove but lack the formal recourse to do so. Other research suggests that principals assign more experienced or effective teachers to more advanced courses not necessarily with the explicit intention of rewarding them but, rather, because such courses require more mastery over the subject matter.

This argument suggests that assigning the best teachers to the most advanced students is a rational practice, especially in subjects where the curriculum is cumulative and the most advanced courses require a strong command of the material (Neild and Farley-Ripple 2008). While this explanation is plausible for the patterns of assignment we observe at the high school level, it cannot explain the patterns of assignment we

observe at the elementary level where curricular differentiation between classrooms is uncommon. Therefore, class assignments seem to be used as rewards, at least to some extent. Though rewarding more experienced, effective or productive employees with their preferred job assignments may be a common and expected practice in other types of organizations, in education this practice may work to exacerbate existing achievement gaps if the best teachers are assigned the relatively highest achieving or most advantaged students in their schools.

Relative to their colleagues in the same school, less experienced, minority and female teachers are assigned more challenging classes. They receive students with lower average prior achievement, more variable prior achievement, more behavioral problems, and more low-income and black students. At the high school level, they receive fewer AP/honors courses, more freshmen, and fewer seniors in their courses. Controlling for other measures of teachers' human capital does little to mediate these associations. Though prior studies suggest that teachers improve as they acquire more experience (at least during their first few years in the teaching profession), controlling for prior effectiveness does not mediate the association between teacher experience and class assignments. Similarly, though there are racial differences in teacher experience, highest degree earned, and effectiveness at raising student achievement, controlling for these factors does not explain the racial gap in class assignment.[7] These results are consistent with prior research on occupational sorting which suggests that group differences in human capital account for only some of the race and gender differences in job assignments within work organizations (Tomaskovic-Devey 1993).

[7] White teachers in the district average 13 years of experience while black and Hispanic teachers average 10 and 8 years of experience, respectively. About 38 percent of black and Hispanic teachers have a master's degree or higher compared to 43 percent of white teachers.

Gender, race, and experience differences in class assignments cannot be fully explained by group differences in teachers' human capital. We posit that power relations in schools also contribute to the uneven class assignments we observe. We provide several additional pieces of evidence to support this argument.

Teachers who held leadership positions within their school consistently receive more favorable assignments than their colleagues who have not held such positions, even after conditioning on teaching experience. Teachers who hold such leadership positions presumably are more involved in the assignment process and seem to reward themselves with higher achieving students. Although less experienced teachers receive more challenging classes in all types of schools, the relationship between being a novice teacher and receiving challenging students is even stronger in schools with higher average teacher experience, in schools with a more stable experienced teaching force, and in schools with more senior teachers. This is consistent with the argument that relations within schools may work to the detriment of those with less experience and therefore less power.

In contexts where teachers have been working together longer and have formed stronger social ties, experienced teachers may be particularly adept at excluding their new colleagues from the most desirable courses. Since principal turnover is fairly high in this district and principals tend to stay at a school for only a few years, principals may be vulnerable to pressures from senior teachers who have been at the school longer (Loeb, Kalogrides, and Horng 2010). In fact, the majority of principals (71 percent in one study) are influenced by senior teachers to at least some extent when making class assignments (Carey and Farris 1994). Presumably, this influence works to help them secure desirable assignments for themselves and their friends (Monk 1987).

Consistent with the qualitative literature on novice teacher assignment patterns, it may well be the

case that veteran teachers attempt to "load up" first-year teachers with disproportionate numbers of difficult students (Monk 1987). This may not necessarily be driven by a desire to make novice teachers' jobs more difficult but, rather, by a desire to make their own jobs easier. This argument is consistent with theories on social closure processes in the workplace. The social closure explanation suggests that powerful groups create and preserve their advantages by restricting access to desirable opportunities to in-group members (Tomaskovic-Devey 1993). Such exclusionary practices result in the reservation of the best positions for members of more powerful groups. The implication of this argument is that experienced teachers benefit from excluding novice teachers from better class assignments and therefore work to reify such exclusionary practices.

Racial differences in class assignments are also likely to result from racial differences in power within schools. Some of the relationship between class assignments and race may be due to black and Hispanic teachers' preferences for, less aversion towards, or superior effectiveness with minority students, as suggested by prior research (Boyd, Lankford, Loeb, and Wyckoff 2005a; Dee 2005; Downey and Pribesh 2004; Hanushek, Kain, and Rivkin 2004; Imazeki 2005; Mueller, Finley, Iverson, and Price 1999; Strunk and Robinson 2006). However, black teachers are assigned lower-achieving students with more behavioral problems even after we control for the racial composition of their classroom. Moreover, when schools are led by white principals or are made up of more white teachers, black and Hispanic teachers receive particularly challenging assignments. This might be due to the lower status position of minorities in such contexts. This may not necessarily be driven by out-group antipathy on the part of whites but, rather, by in-group affinity. Research in organizational demography argues that people tend to develop better relationships and feelings of liking with members of their own group than with those of out-groups (Brewer and Kramer 1985; Elliot and Smith 2001; Stewman 1988; Tsui and O'Reilly 1989). If white principals tend to

develop better relationships with white teachers in their school than they develop with black of Hispanic teachers, then a desire to reward their friends with desired classes may contribute to the racial differences in class assignments we observe in schools led by white principals.

Prior evidence also suggests that employee-employer similarity affects supervisors' ratings of employees' performance which often has implications for promotion opportunities or job assignments (Tsui and O'Reilly 1989). Tsui and O'Reilly (1989) found, for example, that superior-subordinate dissimilarity in demographic characteristics was associated with lower effectiveness as perceived by superiors. If white principals have incorrect perceptions of the teaching skill or content knowledge of the black and Hispanic teachers at their school then this could contribute to minorities' receipt of more challenging students in schools led by white principals.

Overall, the patterns of teacher assignment we observe likely result from a complex process where the leadership is attempting to balance both short and long-term goals as well as pressures from students, teachers, and parents. Eventually, after reconciling contradictory priorities, it is unlikely that the pattern of assignment within schools will be efficient or equitable for teachers or students. While it is unclear whether the differential assignment of minority and female teachers to more challenging courses is unequivocally good or bad for teachers and students, we think that there is clear evidence from prior studies that the assignment of novice teachers to challenging courses is not an ideal practice and likely has negative consequences for teachers, students, and schools.

When new teachers are given assignments they do not feel qualified to undertake this can generate feelings of ineffectiveness and discourage teachers from staying at their school or in the teaching profession (Donaldson and Johnson 2010). Prior research suggests that new teachers are more likely to leave their school when assigned more students who are low-achieving disadvantaged, minority, and who create

disciplinary problems. This lower retention among novice teachers can create instability for schools faced with filling the vacancies such departures create (Feng 2010). When these teachers leave their school, they are likely replaced by other novices leaving such schools in a constant state of flux. The systematic sorting of teachers to certain types of students is also likely to exacerbate already existing achievement gaps within schools. Although student learning gains do not necessarily increase linearly with teacher experience, novice teachers are consistently less effective at raising student achievement compared to their more experienced peers (Rockoff 2004). Consequently, given their higher likelihood of receiving a novice teacher, the achievement of black, Hispanic, and low-income students is likely to suffer as a result of the patterns of assignment we document.

References

Abelson, Michael A., and Barry D. Baysinger. 1984. "Optimal and Dysfunctional Turnover: Toward an Organizational Level Model." *The Academy of Management Review* 9(2): 331–41.

Allensworth, Elaine, Stephen Ponisciak, and Christopher Mazzeo. 2009. "The Schools Teachers Leave: Teacher Mobility in Chicago Public Schools." Consortium on Chicago School Research, University of Chicago.

Becker, Howard S. 1952. "The Career of the Chicago Public Schoolteacher." *The American Journal of Sociology* 57(5):470–77.

Boyd, Donald J., Pamela L. Grossman, Marsha Ing, Hamilton Lankford, Susanna Loeb, and James H. Wyckoff. 2009. "The Influence of School Administrators on Teacher Retention Decisions." CALDER Working Paper No. 25. Washington, D.C.: The Urban Institute.

Boyd, Donald J., Hamilton Lankford, Susanna Loeb, and James H. Wyckoff. 2005a. "The Draw of Home: How Teachers' Preferences for Proximity Disadvantage Urban Schools*." Journal of Policy Analysis and Management* 24(1):1131–32.

———. 2005b. "Explaining the Short Careers of High-Achieving Teachers in Schools with Low-Performing Students." *The American Economic Review* 95(2):166–71.

Brewer, Dominic J. 1993. "Principals and Student Outcomes: Evidence from U.S. High Schools." *Economics of Education Review* 12(4):281–92.

Brewer, Marilynn B., and Roderick M. Kramer. 1985. "The Psychology of Intergroup Attitudes and Behavior." *Annual Review of Psychology* 36(1):219–43.

Carey, Nancy and Elizabeth Farris. 1994. "Curricular Differentiation in Public High Schools." National Center for Education Statistics: 95360, Washington, D.C.

Clotfelter, Charles T., Helen F. Ladd, and Jacob L. Vigdor. 2004. "Who Teaches Whom? Race and the Distribution of Novice Teachers." *Economics of Education Review* 24(4):377–92.

———. 2006. "Teacher-Student Matching and the Assessment of Teacher Effectiveness." *Journal of Human Resources* 41(4):778–820.

Cohen-Vogel, Lora, and La'Tara Osborne-Lampkin. 2007. "Allocating Quality: Collective Bargaining Agreements and Administrative Discretion Over Teacher Assignment." *Educational Administration Quarterly* 43(4):433–61.

Coleman, James S. 1990. "Equality of Educational Opportunity." In *Equality and Achievement in Education*, edited by J. S. Coleman. Boulder: Westview Press.

Conger, Dylan. 2005. "Within-School Segregation in an Urban School District." *Educational Evaluation and Policy Analysis* 27(3):225–44.

Dee, Thomas S. 2005. "A Teacher Like Me: Does Race, Ethnicity, or Gender Matter?" *The American Economic Review* 95(2):158–165.

Donaldson, Morgaen L., and Susan Moore Johnson. 2010. "The Price of Misassignment: The Role of Teaching Assignments in Teach for America Teachers' Exit from Low-Income Schools and the Teaching Profession." *Educational Evaluation and Policy Analysis* 32(2):299–323.

Downey, Douglas B., Paul T. von Hippel, and Beckett A. Broh. 2004. "Are Schools the Great Equalizer? Cognitive Inequality During the Summer Months and the School Year." *American Sociological Review* 69(5):613–35.

Downey, Douglas B., and Shana Pribesh. 2004. "When Race Matters: Teachers' Evaluations of Students' Classroom Behavior." *Sociology of Education* 77(4):267–82.

Elliot, James, and Ryan A. Smith. 2001. "Ethnic Matching of Supervisors to Subordinate Work Groups: Findings on 'Bottom-Up' Ascription and Social Closure." *Social Problems* 48(2):258–76.
Feng, Li. 2010. "Hire Today, Gone Tomorrow: New Teacher Classroom Assignments and Teacher Mobility." *Education Finance and Policy* 5(3):278–316.
Ferguson, Ronald F. 1998. "Teachers' Perceptions and Expectations and the Black-White Test Score Gap." In *The Black-White Test Score Gap*, edited by C. Jencks and M. Phillips (273–317). Washington, D.C.: The Brookings Institution.
Finley, Merrilee K. 1984. "Teachers and Tracking in a Comprehensive High School." *Sociology of Education* 57(4):233–43.
Gamoran, Adam. 1987. "The Stratification of High School Learning Opportunities." *Sociology of Education* 60(3):135–55.
———. 1993. "Alternative Uses of Ability Grouping in Secondary Schools: Can We Bring HighQuality Instruction to LowAbility Classes?" American Journal of Education 102:122.
Greenhaus, Jeffrey H., Saroj Parasuraman, and Wayne M. Wormley. 1990. "Effects of Race on Organizational Experiences, Job Performance Evaluations, and Career Outcomes." The Academy of Managment Journal 33:6486.
Hanushek, Eric, John F. Kain, and Steven G. Rivkin. 2004. "Why Public Schools Lose Teachers." Journal of Human Resources 39:326354.
Horng, Eileen. 2009. "Teacher Tradeoffs: Disentangling Teachers' Preferences for Working Conditions and Student Demographics." American Educational Research Journal 46:690717.
Hough, Heather and Susanna Loeb. 2009. "The Development of a Teacher Salary Parcel Tax: The Quality of Education Act in San Francisco." Policy Analysis for California Education Report, Available from http://www.stanford.edu/group/irepp/slr/docs/Passage%20of%20QTEA%20Research%20Paper.pdf.
Imazeki, Jennifer. 2005. "Teacher Salaries and Teacher Attrition." Economics of Education Review 24:431449.
Ingersoll, Richard. 2001. "Teacher Turnover and Teacher Shortages: An Organizational Analysis." American Educational Research Journal 38:499534.
———. 2002. "The Teacher Shortage: A Case of Wrong Diagnosis and Wrong Presciption." NASSP Bulletin 86:1631.
———. 2004. "Why Do HighPoverty Schools Have Difficulty Staffing their Classrooms with Qualified Teachers?" Center for American Progress and Institute for America's Future.
Jackson, C. Kirabo 2009. "Student Demographics, Teacher Sorting, and Teacher Quality: Evidence From the End of School Desegregation." The Journal of Labor Economics 27:213256.
Johnson, Susan Moore and Sarah E. Birkland. 2003. "Pursuing a "Sense of Success": New Teachers Explain Their Career Decisions." American Educational Research Journal 40:581617.
Kanter, Rosabeth M. 1977. Men and Women of the Corporation. New York: Basic Books.
Kelly, Sean. 2004. "Are Teachers Tracked? On What Basis and With What Consequences." Social Psychology of Education 7:5572.
Krei, Melinda. 1998. "Intensifying the Barriers: The Problem of Inequitable Teacher Allocation in Low-Income Urban Schools." Urban Education 33:7194.
Lankford, Hamilton, Susanna Loeb, and James Wyckoff. 2002. "Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis." Educational Evaluation and Policy Analysis 24:3762.
Lareau, Annette. 1987. "Social Class Differences in FamilySchool Relationships: The Importance of Cultural Capital." Sociology of Education 60:7385.
———. 2000. *Home Advantage: Social Class and Parental Intervention in Elementary Education*. Lanham,

MD: Rowman & Littlefield.
Loeb, Susanna, Demetra Kalogrides, and Eileen Horng. 2010. "Principal Preferences and the Unequal Distribution of Principals Across Schools." *Education Evaluation and Policy Analysis* 32(2):205–29.
Lucas, Samuel R., and Mark Berends. 2002. "Sociodemographic Diversity, Correlated Achievement, and De Facto Tracking." *Sociology of Education* 75(4):328–48.
Marvel, John, Deanna M. Lyter, Pia Peltola, Gregory A. Strizek, Beth A. Morton, and Renee Rowland. 2007. "Teacher Attrition and Mobility: Results from the 200405 Teacher Follow-Up Survey." Washington, D.C.: National Center for Education Statistics: NCES 2007307.
Meyer, Robert H. 1997. "Value-Added Indicators of School Performance: A Primer." *Economics of Education Review* 16(3):283–301.
Mihaly, Kata, Daniel F. McCaffrey, J.R. Lockwood, and Tim R. Sass. 2010. "Centering and Reference Groups for Estimates of Fixed Effects: Modifications to felsdvreg." *The Stata Journal* 10(1):82–103.
Monk, David H. 1987. "Assigning Elementary Pupils to Their Teachers." *The Elementary School Journal* 88(2):166–87.
Mortimore, Peter. 1993. "School Effectiveness and the Management of Effective Learning and Teaching." *School Effectiveness and School Improvement* 4(4):290–310.
Mueller, Charles W., Ashley Finley, Roderick D. Iverson, and James L. Price. 1999. "The Effects of Group Racial Composition on Job Satisfaction, Organizational Commitment, and Career Commitment: The Case of Teachers." *Work and Occupations* 26(2):187–219.
Murnane, Richard, and Barbara Phillips. 1981. "What Do Effective Teachers of Inner-City Children Have in Common." *Social Science Research* 10(1):83–100.
National Education Association. 1990. "Academic Tracking: Report of the NEA Executive Committee/Subcommittee on Academic Tracking." Washington, D.C.: National Education Association.
Neild, Ruth Curran, and Elizabeth Farley-Ripple. 2008. "Within-School Variation in Teacher Quality: The Case of Ninth Grade." *American Journal of Education* 114(3):271–305.
Nye, Barbara, Spyros Konstantopoulos, and Larry V. Hedges. 2004. "How Large Are Teacher Effects?" *Educational Evaluation and Policy Analysis* 26(3):237–57.
Oakes, Jeannie. 1985. *Keeping Track: How Schools Structure Inequality*. New Haven, CT: Yale University Press.
Oakes, Jeannie, and Gretchen Guiton. 1995. "Matchmaking: The Dynamics of High School Tracking Decisions." *American Educational Research Journal* 32(1):3–33.
Rivkin, Steven G., Erik A. Hanushek, and John F. Kain. 2005. "Teachers, Schools, and Academic Achievement." *Econometrica* 73(2):417–58.
Rockoff, Jonah E. 2004. "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." *American Economic Review* 94(2):247–52.
Rothstein, Jesse. 2009. "Student Sorting and Bias in Value-Added Estimation: Selection on Observables and Unobservables." *Education Finance and Policy* 4(4):537–71.
———. 2010. "Teacher Quality in Educational Production: Tracking, Decay, and Student Achievement." *The Quarterly Journal of Economics* 125(1):175–214.
Rubin, Donald, Elizabeth A Stuart, and Elaine L. Zanutto. 2004. "A Potential Outcomes View of Value-Added Assessment in Education." *Journal of Educational and Behavioral Statistics* 29(1):103–16.
Sammons, Pam, Josh Hillman, and Peter Mortimore. 1995. *Key Characteristics of Effective Schools: A Review of School Effectiveness Research*. University of London Institute of Education: International School Effectiveness and Improvement Center.
Scafidi, Benjamin, David L. Sjoquist, and Todd R. Stinebrickner. 2008. "Race, Poverty, and Teacher

Mobility." *Economics of Education Review* 26(2):145–59.
Smith, Thomas M., and Richard M. Ingersoll. 2004. "What are the Effects of Induction and Mentoring on Beginning Teacher Turnover?" *American Educational Research Journal* 41(3):681–714.
Stewman, Shelby. 1988. "Organizational Demography." *Annual Review of Sociology* 14(1):173–202.
Strunk, Katharine O., and Joseph P. Robinson. 2006. "Oh, Won't You Stay: A Multilevel Analysis of the Difficulties in Retaining Qualified Teachers." *Peabody Journal of Education* 8(4)1:65-94.
Taylor, Barbara M., David Pearson, Kathleen Clark, and Sharon Walpole. 2000. "Effective Schools and Accomplished Teachers: Lessons about Primary-Grade Reading Instruction in Low-Income Schools." *The Elementary School Journal* 101(2):121–65.
Tomaskovic-Devey, Donald. 1993. "The Gender and Race Composition of Jobs and the Male/Female, White/Black Pay Gaps." *Social Forces* 72(1):45–76.
Tsui, Anne S., and Charles A. O'Reilly. 1989. "Beyond Simple Demographic Effects: The Importance of Relational Demography in Superior-Subordinate Dyads." *The Academy of Management Journal* 32(2):402–23.

Appendix A: Teacher Value-Added Estimation

The goal of value-added models is to statistically isolate the contribution of schools or teachers to student outcomes from all other factors that may influence outcomes (Meyer 1997; Rubin, Stuart, and Zanutto 2004). Isolating causal effects is important given that differences in student and family characteristics account for more of the variation in student outcomes than school-related factors (Coleman 1990; Downey, Hippel, and Broh 2004) and that students are not randomly assigned to teachers or schools (Lankford, Loeb, and Wyckoff 2002; Rothstein 2009).

A student's achievement level in any given year is a cumulative function of current and prior school, family, and neighborhood experiences. While researchers seldom have access to complete information on all factors that would predict a student's current achievement level (Rivkin, Hanushek, and Kain 2005), much of the confounding influence of unobserved student academic and family characteristics can be eliminated by focusing on gains in student achievement over specific time periods, usually of one school year. The inclusion of prior achievement as a way of controlling for prior student or family experiences reduces the potential for unobserved factors to introduce bias in the estimation of teacher effectiveness.

Yet, there still may be unobservable differences between students that influence the amount they learn each year in addition to their score at the beginning of the year. Factors such as innate ability, motivation, familial support for education, or parental education could all have an impact on student learning gains. We can control for some of these differences by including student-level covariates in the model; however, the information available in administrative datasets such as ours is limited. One way of controlling for all observed and unobserved student characteristics that may be associated with achievement gains is to include a student fixed effect in the value-added estimation. Such a specification is appealing because it allows for the examination of differences in learning within the same student in years they are in a class with a different teacher.

Equation (1) describes our teacher value-added model which predicts the achievement gain between year *t* and *t-1* for student *i* with teacher *j* in grade *g* as a function of time-varying student characteristics(X_{ijgst}), time-varying school characteristics (S_{st}), grade, year, and student fixed effects (π_g, π_t, π_i), and a teacher by year fixed effect (δ_{jt}). Characteristics of students' classrooms are omitted from the model since they are collinear with the teacher by year fixed effect.

$$A_{ijgst} - A_{ijgs(t-1)} = \beta X_{ijgst} + \gamma S_{st} + \pi_g + \pi_t + \pi_i + \delta_{jt} + \varepsilon_{ijgst} \quad (1)$$

The parameter δ reflects the contribution of a given teacher to growth in student achievement after controlling for all observed time-varying student characteristics, observed and unobserved time invariant student characteristics, and characteristics of students' schools that may be associated with learning. Note that these models account for all unobserved time-invariant attributes of students that may be associated with learning (via the student fixed effect), but not for differences across teachers in unobservable time-varying student characteristics that are associated with learning.

The test scores used to generate the value-added estimates are the scaled scores from the FCAT, standardized to have a mean of zero and a standard deviation of one for each grade in each year. Subscripts for subjects are omitted for simplicity but we estimate **Equation 1** separately for student achievement gains in math and reading. Since we use a lagged test score to construct our dependent variables, the youngest tested grade (grade 3) and the first year of data we have (2003) are omitted from the analyses though their information is used to compute a learning gain in grade 4 and in 2004. The time-varying student characteristics used in our analyses are whether the student qualifies for free or reduced priced lunch, whether they are currently classified as limited English proficient, whether they are repeating

the grade in which they are currently enrolled, and the number of days they missed school in a given year due to absence or suspension. Student race and gender are absorbed by the student fixed effect. The school-level controls used in the models include average prior achievement, and proportion black, Hispanic and receiving free or reduced priced lunches. After estimating **Equation 1** we save the teacher by year fixed effects and their corresponding standard errors.[8] The estimated coefficients for these fixed effects include measurement error as well as real differences in achievement gains associated with teachers or schools. We therefore shrink the estimates using the empirical Bayes method to bring imprecise estimates closer to the mean. After shrinking the estimates, we standardize them to have a mean of 0 and a standard deviation of 1 in each year.

[8] To estimate Equation 1, we use the program *felsdvregdm* developed in Stata by Mihaly et al. (2010). This program generates fixed effects estimates and standard errors for each teacher relative to the mean effect for a user-specified reference group (in our case, teachers in a given grade) rather than relative to an arbitrarily omitted reference teacher.

Figures

Figure 1. Average Prior Achievement of Teachers' Students, Elementary School Teachers

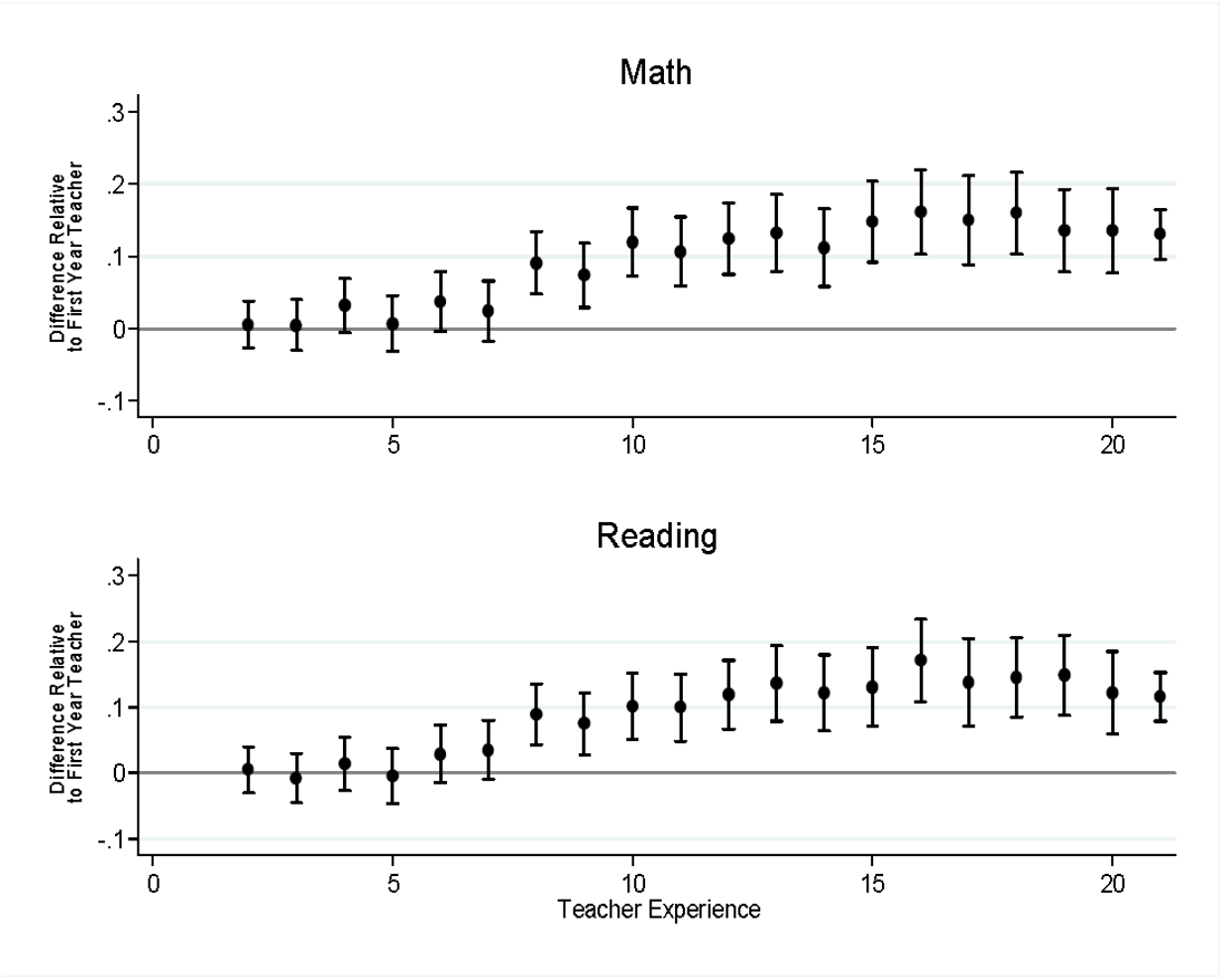


Figure 2. Average Prior Achievement of Teachers' Students, Middle and High School Teachers

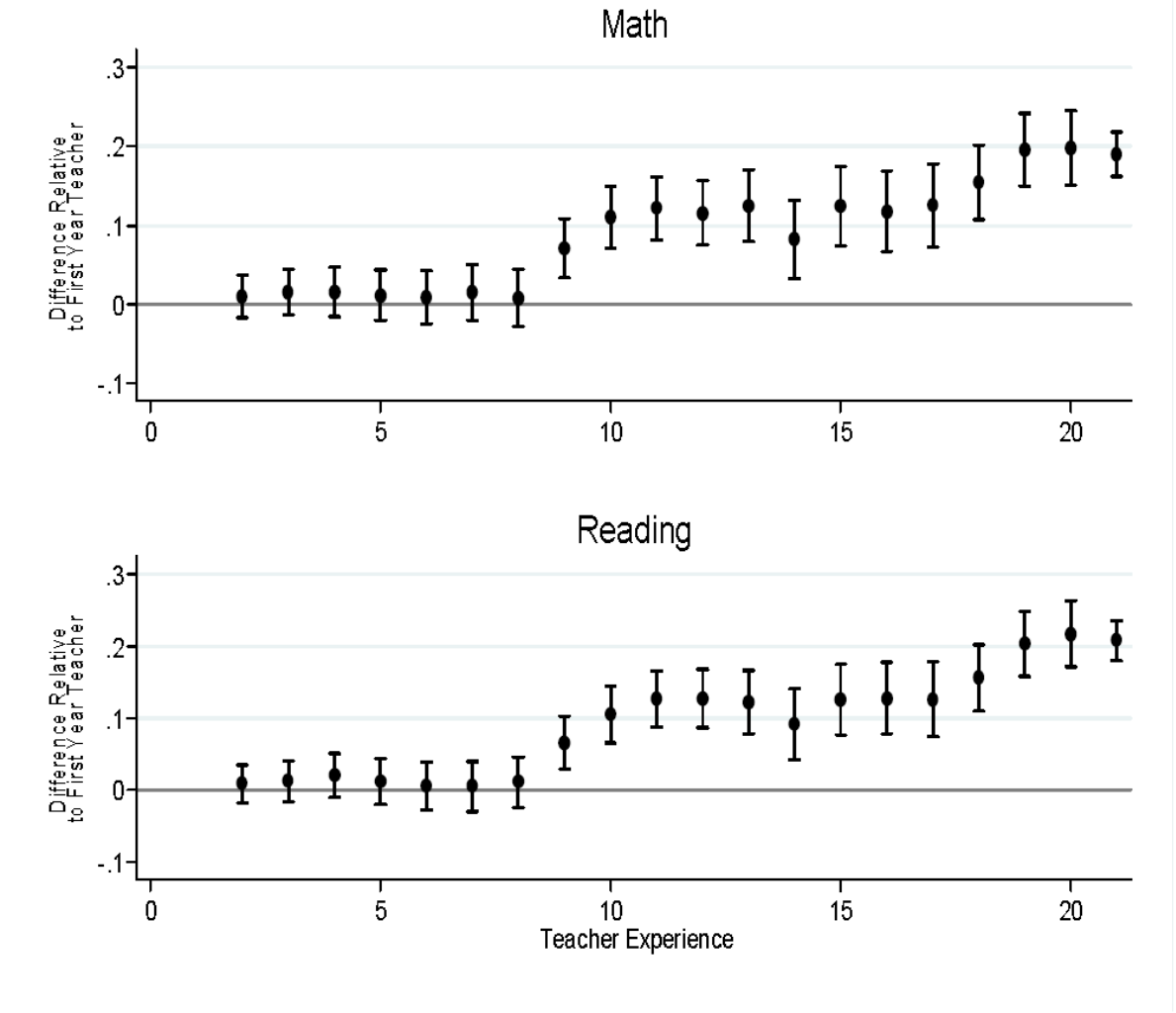
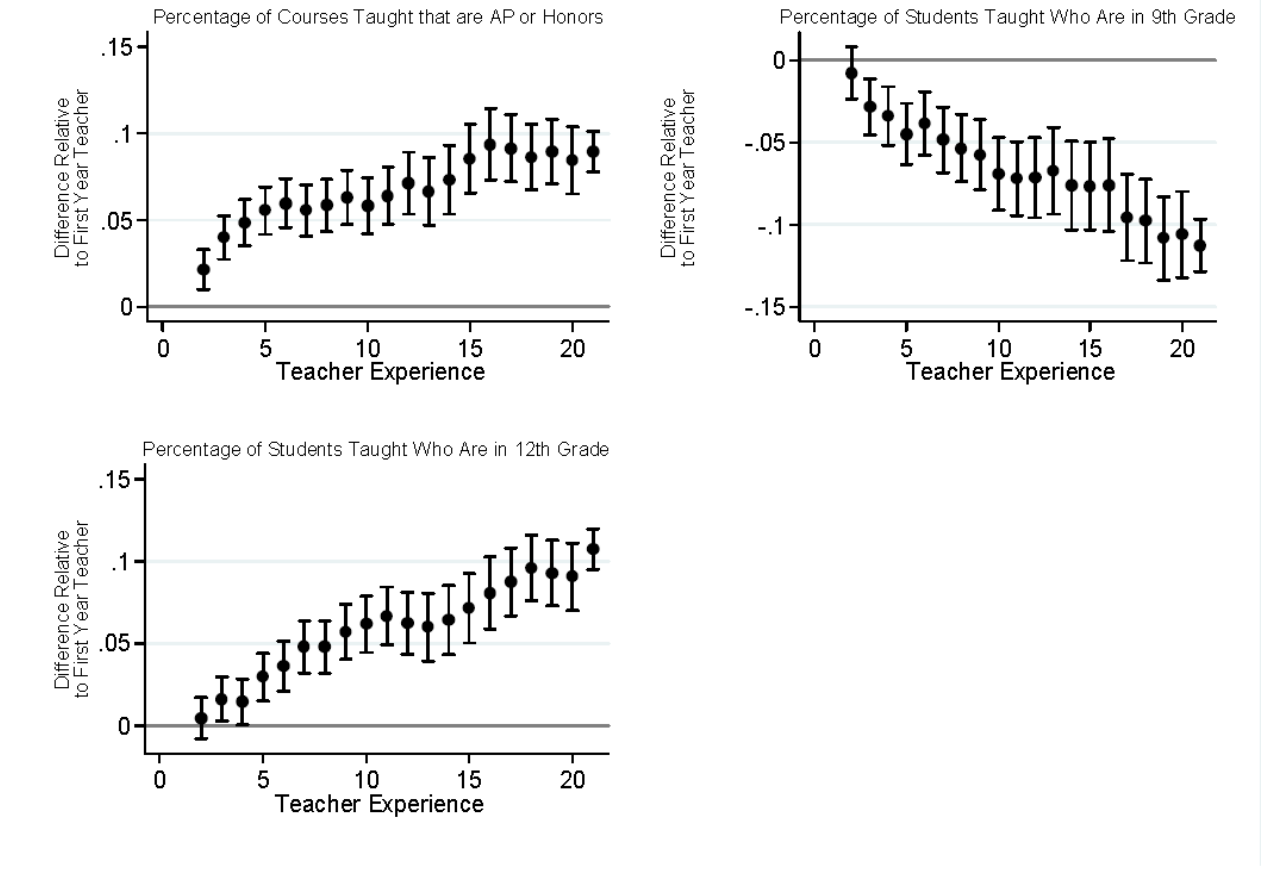


Figure 3. Advanced Courses Taught and Grade of Students Taught, High School Teachers



Tables

Table 1. Descriptive Statistics

Mean		SD
Teacher Characteristics		
First or Second Year (Novice)	0.20	
Total Years in District	9.55	9.29
White	0.28	
Black	0.27	
Hispanic	0.43	
Female	0.76	
Age	42.23	11.72
Master's Degree or Higher	0.40	
Total Teacher Observations (all teachers)	102646	
Total Teacher Observations (with tested students in prior year)	76644	
Teacher Survey Items		
Ever Served as Grade or Department Head	0.36	
Ever a Member of School-Wide Leadership Team	0.17	
Ever a Professional Development Leader/Instructor	0.15	
Acceptance Rate of Undergraduate Institution	52.19	20.18
75th Percentile of SAT/ACT Scores of Undergraduate School (in 100s)	11.82	1.21
Total Survey Observations	15840	
Student Characteristics		
Black	0.27	
Hispanic	0.60	
Female	0.49	
Limited English Proficient	0.16	
Retained in Year Prior	0.04	
Eligible for Subsidized Lunch	0.61	
Chronically Absent (21+ Days)	0.09	
Suspended at Least Once	0.07	
Total Student Observations (all students)	2145115	
Total Student Observations (with test scores)	1246335	

Notes: All figures are averaged over the 2003-04 to the 2008-09 school years except for the survey items which were measured in the spring of 2008.

Table 2: Characteristics of Teachers' Classrooms by Experience (coefficients/standard errors)

	Novice Teacher Indicator		Continuous Teacher Experience Measure	
	Model 1	Model 2	Model 3	Model 4
Average Math Achievement of Current Students Last Year				
Teacher Experience	-0.100 ***	-0.056 ***	0.019 ***	0.012 ***
	(0.007]	(0.006]	(0.001]	(0.001]
N	70896	70896	70896	70896
Proportion of Current Students Scoring at Lowest Math Proficiency Level Last Year				
Teacher Experience	0.038 ***	0.017 ***	-0.006 ***	-0.004 ***
	(0.003]	(0.002]	(0.000]	(0.000]
N	70896	70896	70896	70896
Proportion of Current Students Scoring at Highest Math Proficiency Level Last Year				
Teacher Experience	-0.016 ***	-0.010 ***	0.003 ***	0.002 ***
	(0.001]	(0.001]	(0.000]	(0.000]
N	70896	70896	70896	70896
Average Reading Achievement of Current Students Last Year				
Teacher Experience	-0.096 ***	-0.054 ***	0.018 ***	0.012 ***
	(0.008]	(0.007]	(0.001]	(0.001]
N	70913	70913	70913	70913
Proportion of Current Students Scoring at Lowest Reading Proficiency Level Last Year				
Teacher Experience	0.033 ***	0.017 ***	-0.006 ***	-0.004 ***
	(0.003]	(0.003]	(0.000]	(0.000]
N	70913	70913	70913	70913
Proportion of Current Students Scoring at Highest Reading Proficiency Level Last Year				
Teacher Experience	-0.012 ***	-0.007 ***	0.002 ***	0.001 ***
	(0.001]	(0.001]	(0.000]	(0.000]
N	70913	70913	70913	70913
Proportion of Students Chronically (21+ Days) Absent in Prior Year				
Teacher Experience	0.013 ***	0.005 ***	-0.002 ***	-0.001 ***
	(0.001]	(0.001]	(0.000]	(0.000]
N	94729	94729	94729	94729
Proportion of Current Students Suspended at Least Once in Prior Year				
Teacher Experience	0.012 ***	0.004 ***	-0.002 ***	-0.001 ***
	(0.001]	(0.001]	(0.000]	(0.000]
N	94729	94729	94729	94729
Proportion F/R Price Lunch				
Teacher Experience	0.044 ***	0.008 ***	-0.007 ***	-0.001 ***
	(0.002]	(0.001]	(0.000]	(0.000]
N	94729	94729	94729	94729
Proportion Black				
Teacher Experience	0.079 ***	0.007 ***	-0.012 ***	-0.001 ***
	(0.003]	(0.001]	(0.000]	(0.000]
N	94729	94729	94729	94729
Teacher-Level Controls	X	X	X	X
School by Year by Grade Fixed Effect	---	X	---	X

Notes: *p<.05, **p<.01, ***p<.001 Novice teacher is defined as someone who is in their first or second year in the district. The achievement models only include teachers who taught students who were tested in the prior year. The models with a continuous measure of teacher experience also include a quadratic. The quadratic terms are consistently statistically significant but close to 0.

Table 3: Characteristics of Teachers' Classrooms by Types of Experience (2008 Survey Respondents) (coefficients/standard errors)

	Math		Reading		F/R Lunch		Black		Low Math		High Math	
Years of Experience at School	0.010	***	0.010	***	-0.001	***	-0.001	**	-0.003	***	0.001	***
	(0.001)		(0.001)		(0.000)		(0.000)		(0.000)		(0.000)	
Years of Experience at Other Schools in District	0.001		0.001		0.000		0.000		-0.001		0.000	
	(0.001)		(0.001)		(0.000)		(0.000)		(0.000)		(0.000)	
School Fixed Effect	X		X		X		X		X		X	
N	7699		7700		10280		10280		7714		7714	

Notes: *p<.05, **p<.01, ***p<.001 Outcomes are denoted by the column headers. Math and reading refer to the average prior math and reading achievement of a teacher's current students; F/R lunch is the proportion of students in the teacher's class receiving free or reduced priced lunches; black is the proportion black in a teacher's class and low math and high math are the proportion of students in a teacher's class that scored in the highest and lowest proficiency level on the FCAT in the prior year.

Table 4: Characteristics of Teachers' Classrooms by Teacher Demographics and Highest Degree (coefficients/standard errors)

	Average Prior Math Achievement			SD of Prior Math Achievement		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Female Teacher	-0.084 ***	-0.087 ***	-0.069 ***	-0.010 ***	-0.011 ***	-0.011 ***
	(0.005)	(0.006)	(0.005)	(0.002)	(0.002)	(0.002)
Black Teacher	-0.118 ***	-0.113 ***	-0.045 ***	0.012 ***	0.007 **	0.002
	(0.007)	(0.007)	(0.006)	(0.002)	(0.002)	(0.002)
Hispanic Teacher	-0.056 ***	-0.062 ***	-0.036 ***	0.021 ***	0.018 ***	0.015 ***
	(0.006)	(0.006)	(0.006)	(0.002)	(0.002)	(0.002)
Teacher Has MA	0.006	-0.001	-0.006	-0.003	-0.004 *	-0.001
	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)
N	70896	70896	70896	69130	69130	69130
	Proportion Suspended in Prior Year			**Proportion Chronically Absent in Prior Year**		
Female Teacher	0.001	0.001 +	0.000	0.003 ***	0.003 ***	0.003 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Black Teacher	0.012 ***	0.013 ***	0.007 ***	0.005 ***	0.006 ***	0.002 **
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Hispanic Teacher	-0.001 *	-0.002 *	-0.000	-0.003 ***	-0.002 **	-0.003 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Teacher Has MA	-0.001	-0.000	-0.000	-0.002 **	-0.001 +	-0.001 *
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
N	94729	94729	94729	94729	94729	94729
	Proportion F/R Lunch			**Proportion Black**		
Female Teacher	0.005 ***	0.004 ***		0.001	0.001	
	(0.001)	(0.001)		(0.001)	(0.001)	
Black Teacher	0.016 ***	0.016 ***		0.027 ***	0.023 ***	
	(0.001)	(0.001)		(0.001)	(0.001)	
Hispanic Teacher	0.010 ***	0.010 ***		-0.012 ***	-0.009 ***	
	(0.001)	(0.001)		(0.001)	(0.001)	
Teacher Has MA	-0.003 **	-0.002 **		-0.004 ***	-0.003 ***	
	(0.001)	(0.001)		(0.001)	(0.001)	
N	94729	94729		94729	94729	
Control for Black/Hispanic Students in Grade	---	X	---	---	X	---
Control for Black/Poor Students in Class	---	---	X	---	---	X
School by Year by Grade FE	X	X	X	X	X	X

Notes: *p<.05, **p<.01, ***p<.001

Table 5: Characteristics of Teachers' Classrooms by Teacher Characteristics (coefficients/standard errors)

	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	Average Math Achievement			**SD of Math Achievement**			**Proportion Absent 21+ Days**		
Female Teacher	-0.014	-0.015	0.003	0.013	0.013	0.011	0.001	0.001	0.001
	(0.023)	(0.022)	(0.015)	(0.008)	(0.007)	(0.007)	(0.002)	(0.002)	(0.002)
Black Teacher	-0.177 ***	-0.144 ***	-0.055 **	0.012	0.007	0.010	0.009 ***	0.007 **	0.005 *
	(0.028)	(0.027)	(0.019)	(0.009)	(0.009)	(0.009)	(0.003)	(0.002)	(0.002)
Hispanic Teacher	-0.054 *	-0.048	-0.009	0.005	0.004	0.002	-0.002	-0.003	-0.002
	(0.025)	(0.025)	(0.017)	(0.008)	(0.008)	(0.008)	(0.002)	(0.002)	(0.002)
Teacher Has MA	0.064 **	0.058 **	0.020	-0.002	-0.002	-0.000	-0.001	-0.001	-0.000
	(0.020)	(0.020)	(0.014)	(0.007)	(0.007)	(0.006)	(0.002)	(0.002)	(0.002)
Years in the District	0.009 ***	0.008 ***	0.001	-0.001 *	-0.001	-0.000	-0.000 ***	-0.000 **	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Value Added in Prior Year		0.188 ***	0.083 ***		-0.026 ***	-0.018 ***		-0.010 ***	-0.007 ***
		(0.012)	(0.008)		(0.004)	(0.004)		(0.001)	(0.001)
Lag of Outcome			0.672 ***			0.335 ***			0.290 ***
			(0.011)			(0.016)			(0.012)
N	6020	6020	6020	5954	5954	5954	6658	6658	6658
	Proportion Suspended			**Proportion F/R Lunch**			**Proportion Black**		
Female Teacher	0.002	0.002	0.003	-0.001	-0.001	0.000	-0.004	-0.004	-0.004
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Black Teacher	0.012 ***	0.010 ***	0.007 **	0.026 ***	0.024 ***	0.015 ***	0.020 ***	0.019 ***	0.018 ***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Hispanic Teacher	-0.005 +	-0.005 +	-0.003	0.010 *	0.010 *	0.004	-0.004	-0.004	-0.003
	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Teacher Has MA	-0.004 +	-0.004	-0.001	-0.006	-0.006	-0.004	-0.005	-0.004	-0.003
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Years in the District	-0.000 *	-0.000 +	0.000	-0.001 ***	-0.001 ***	-0.001 ***	-0.000 **	-0.000 *	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Value Added in Prior Year		-0.012 ***	-0.007 ***		-0.015 ***	-0.010 ***		-0.008 ***	-0.007 ***
		(0.001)	(0.001)		(0.002)	(0.002)		(0.001)	(0.001)
Lag of Outcome			0.437 ***			0.311 ***			0.145 ***
			(0.011)			(0.011)			(0.009)
N	6658	6658	6658	6658	6658	6658	6658	6658	6658
School-Year-Grade FE	X	X	X	X	X	X	X	X	X

Notes: *p<.05, **p<.01, ***p<.001 Models are restricted to teachers who taught students tested in math for whom we were able to calculate value-added measures. Estimates of the relationship between reading value-added and class assignments are similar to those shown here and are available upon request.

Table 6. 2008 Class Assignments Among 2008 Survey Respondents

	Math		Reading		Math Low		Math High		F/R Lunch		Suspended		Chronic Absent	
Ever Served as Grade or	0.076	***	0.066	***	-0.022	***	0.012	***	-0.007	*	-0.004	*	-0.008	***
Department Head	(0.017)		(0.018)		(0.006)		(0.003)		(0.003)		(0.001)		(0.002)	
Ever a Member of School-Wide	0.059	**	0.074	**	-0.021	**	0.006	+	-0.008	*	-0.000		-0.003	
Leadership Team	(0.022)		(0.023)		(0.007)		(0.003)		(0.004)		(0.002)		(0.002)	
Ever a Professional Development	0.133	***	0.137	***	-0.035	***	0.021	***	-0.004		-0.004	*	-0.011	***
Leader/Instructor	(0.022)		(0.024)		(0.008)		(0.004)		(0.004)		(0.002)		(0.002)	
Constant	-0.133	**	-0.100	*	0.213	***	0.080	***	0.629	***	0.059	***	0.076	***
	(0.042)		(0.045)		(0.014)		(0.006)		(0.006)		(0.004)		(0.004)	
N	7698		7699		7713		7713		10278		10313		10313	
Acceptance Rate of	0.001		0.000		-0.000		-0.000		0.000	*	-0.000		-0.000	
Undergraduate Institution	(0.001)		(0.001)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
Undergraduate Institution SAT	0.038	***	0.040	***	-0.012	***	0.004	**	-0.003	*	-0.003	**	-0.003	**
Score in 100s	(0.008)		(0.009)		(0.003)		(0.001)		(0.001)		(0.001)		(0.001)	
Constant	-0.610	***	-0.585	***	0.375	***	0.045	*	0.642	***	0.094	***	0.105	***
	(0.134)		(0.136)		(0.048)		(0.019)		(0.020)		(0.013)		(0.013)	
N	5302		5303		5312		5312		7138		7138		7138	
School Fixed Effect	X		X		X		X		X		X		X	
Other Teacher-Level Controls	X		X		X		X		X		X		X	

Notes : *p<.05, **p<.01, ***p<.001 Outcome is denoted by the column header. Math and reading are the average of the prior year's standardized test scores of a teacher's current students; math high and math low are the proportion of a teacher's current students who scored at the highest and lowest proficiency level in math on the Florida test (FCAT) in the prior year; F/R lunch is the proportion of a teacher's students eligible for free/reduced priced lunches; and suspended and chronically absent are the prorpotion of students who were suspended at least once in the prior year or were absent 21 days or more in the prior year. All models also control for teacher gender, race, years of experience at their current school and their highest degree earned. Undergraduate SAT score is measured as the 75th percentile of SAT scores of the 2007 incoming freshmen class at the institution from which a teacher received their undergraduate degree.

Table 7. Characteristics of High School Teachers' Classes (coefficients/standard errors)

	AP/ Honors		9th Graders		12th Graders	
Novice	-0.051	***	0.053	***	-0.046	***
	(0.004)		(0.005)		(0.004)	
Black	-0.048	***	0.067	***	-0.038	***
	(0.004)		(0.005)		(0.004)	
Hispanic	-0.015	***	0.012	**	-0.016	***
	(0.003)		(0.004)		(0.004)	
Female	0.021	***	0.015	***	-0.016	***
	(0.003)		(0.004)		(0.003)	
Master's Degree+	0.020	***	-0.015	***	0.008	**
	(0.003)		(0.004)		(0.003)	
Age	0.000	+	-0.003	***	0.002	***
	(0.000)		(0.000)		(0.000)	
School by Year by Subject FE	X		X		X	
Observations	31914		31914		31914	

Notes: *p<.05, **p<.01, ***p<.001 Advanced placement or honors courses refers to the percentage of teachers' classes in a given year that have AP or Honor's in the course title. Ninth and 12th graders refers to the percentage of students in teachers' courses who were enrolled in the 9th or 12th grades in a given year.

Table 8: Characteristics of Teachers' Classrooms by Experience and Interactions with Average Experience of All Teachers in School (coefficients/standard errors)

	Novice Teacher Indicator				Continuous Teacher Experience Measure			
	Model 1		Model 2		Model 3		Model 4	
Average Math Achievement of Current Students Last Year								
Teacher Experience	-0.056	***	-0.051	***	0.011	***	0.011	***
	(0.006)		(0.007)		(0.001)		(0.001)	
Teacher Experience*			-0.013	+			0.001	**
Average Teacher Experience at School			(0.007)				(0.000)	
N	70896		70896		70896		70896	
Average Reading Achievement of Current Students Last Year								
Teacher Experience	-0.054	***	-0.047	***	0.010	***	0.011	***
	(0.007)		(0.007)		(0.001)		(0.001)	
Teacher Experience*			-0.010				0.001	**
Average Teacher Experience at School			(0.007)				(0.000)	
N	70913		70913		70913		70913	
Proportion of Current Students Suspended at Least Once in Prior Year								
Teacher Experience	0.004	***	0.004	***	-0.001	***	-0.001	***
	(0.001)		(0.001)		(0.000)		(0.000)	
Teacher Experience*			-0.001				0.000	*
Average Teacher Experience at School			(0.001)				(0.000)	
N	94729		94729		94729		94729	
Proportion F/R Price Lunch								
Teacher Experience	0.008	***	0.007	***	-0.001	***	-0.001	***
	(0.001)		(0.001)		(0.000)		(0.000)	
Teacher Experience*			0.001				-0.000	*
Average Teacher Experience at School			(0.001)				(0.000)	
N	94729		94729		94729		94729	
Proportion Black								
Teacher Experience	0.007	***	0.007	***	-0.002	***	-0.001	***
	(0.001)		(0.001)		(0.000)		(0.000)	
Teacher Experience*			-0.000				0.000	
Average Teacher Experience at School			(0.001)				(0.000)	
N	94729		94729		94729		94729	
Teacher-Level Controls	X		X		X		X	
School by Year by Grade Fixed Effect	X		X		X		X	
Clustered Standard Errors by School-Year	X		X		X		X	

Notes: *p<.05, **p<.01, ***p<.001 Average experience of teachers in a school is standardized in each year. It is the average experience for all teachers in the school, excluding teacher *i*.

Table 9: Achievement Characteristics of Novice Teachers' Classrooms by The Experience of their Colleagues (coefficients/standard errors)

	Model 1		Model 2	
Average Math Achievement of Current Students Last Year				
New Teacher	-0.004		-0.007	
	(0.015)		(0.021)	
New Teacher*Retention Rate of Non-Novice Teachers	-0.106	***		
	(0.029)			
New Teacher*Proportion Senior Teachers at School			-0.134	*
			(0.054)	
N	57086		70824	
Average Reading Achievement of Current Students Last Year				
New Teacher	0.001		-0.014	
	(0.016)		(0.021)	
New Teacher*Retention Rate of Non-Novice Teachers	-0.113	***		
	(0.031)			
New Teacher*Proportion Senior Teachers at School			-0.109	*
			(0.054)	
N	57108		70841	
Proportion of Current Students Scoring at Lowest Math Proficiency Level Last Year				
New Teacher	-0.001		0.013	+
	(0.006)		(0.007)	
New Teacher*Retention Rate of Non-Novice Teachers	0.034	**		
	(0.011)			
New Teacher*Proportion Senior Teachers at School			0.010	
			(0.019)	
N	57178		70934	
Proportion of Current Students Scoring at Highest Math Proficiency Level Last Year				
New Teacher	-0.007	**	-0.000	
	(0.002)		(0.003)	
New Teacher*Retention Rate of Non-Novice Teachers	-0.009	*		
	(0.004)			
New Teacher*Proportion Senior Teachers at School			-0.028	***
			(0.008)	
N	57178		70934	
Proportion of Students Repeating Grade				
New Teacher	-0.006	**	-0.006	*
	(0.002)		(0.003)	
New Teacher*Retention Rate of Non-Novice Teachers	0.011	**		
	(0.004)			
New Teacher*Proportion Senior Teachers at School			0.016	*
			(0.007)	
N	76906		94957	
Teacher-Level Controls	X		X	
School by Year by Grade Fixed Effect	X		X	
Clustered Standard Errors (by School-Year)	X		X	

Notes: *p<.05, **p<.01, ***p<.001The main effect for the retention rate of non-novice teachers and the Proportion of senior teachers are absorbed by the fixed effect. The retention rate of experienced teachers refers to the Proportionage of non-novice teachers in a year who were teaching the same grade at the same school 1 year ago. A novice teacher is defined as someone who is in thier first or second year in the district. The model with the one year retention rate necessarily excludes our first year of data (2004). Senior teachers are defined as those with ten or more years of experience in the district.

Table 10: Race and Classroom Assignment (coefficients/standard errors)

	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	Average Math Achievement			**SD of Math Achievement**			**Proportion Absent 21+ Days**		
Black Teacher	-0.106 ***	-0.041 *	-0.043 *	0.006 +	-0.015 *	-0.014 *	0.003 ***	-0.002	-0.002
	(0.009)	(0.019)	(0.019)	(0.003)	(0.007)	(0.007)	(0.001)	(0.002)	(0.002)
Hispanic Teacher	-0.058 ***	-0.048 **	-0.049 **	0.019 ***	0.007	0.007	-0.004 ***	-0.005 *	-0.004 *
	(0.008)	(0.018)	(0.018)	(0.003)	(0.006)	(0.006)	(0.001)	(0.002)	(0.002)
Black Teacher*	-0.038 *		-0.014	0.014 *		0.006	0.005 *		0.003
White Principal	(0.017)		(0.018)	(0.006)		(0.006)	(0.002)		(0.002)
Hispanic Teacher*	-0.013		-0.009	0.003		-0.002	0.002		0.002
White Principal	(0.014)		(0.015)	(0.005)		(0.005)	(0.001)		(0.002)
Black Teacher*Proportion White		-0.340 ***	-0.316 ***		0.106 ***	0.096 **		0.031 ***	0.026 **
Teachers at School		(0.077)	(0.085)		(0.027)	(0.030)		(0.009)	(0.010)
Hispanic Teacher*Proportion White		-0.046	-0.030		0.052 *	0.055 *		0.004	0.000
Teachers at School		(0.070)	(0.073)		(0.024)	(0.026)		(0.007)	(0.008)
N	63637	63637	63637	62090	62090	62090	84904	84904	84904
	Proportion Suspended			**Proportion F/R Lunch**			**Proportion Black**		
Black Teacher	0.011 ***	0.006 *	0.005 *	0.012 ***	-0.008 **	-0.008 *	0.024 ***	0.008 **	0.008 **
	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)
Hispanic Teacher	-0.001	-0.001	-0.001	0.008 ***	-0.007 *	-0.006	-0.012 ***	-0.019 ***	-0.019 ***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)
Black Teacher*	0.001		-0.001	0.014 ***		0.007 *	0.010 ***		0.004
White Principal	(0.002)		(0.002)	(0.003)		(0.003)	(0.003)		(0.003)
Hispanic Teacher*	-0.001		-0.001	0.009 **		0.004	0.001		-0.002
White Principal	(0.001)		(0.002)	(0.003)		(0.003)	(0.002)		(0.003)
Black Teacher*Proportion White		0.028 **	0.031 **		0.104 ***	0.093 ***		0.085 ***	0.079 ***
Teachers at School		(0.010)	(0.011)		(0.015)	(0.016)		(0.014)	(0.015)
Hispanic Teacher*Proportion White		-0.006	-0.003		0.071 ***	0.065 ***		0.029 *	0.032 *
Teachers at School		(0.007)	(0.008)		(0.014)	(0.015)		(0.013)	(0.014)
N	84904	84904	84904	84904	84904	84904	84904	84904	84904

Notes: *p<.05, **p<.01, ***p<.001 All models include teacher-level controls, school by year by grade fixed effects, and standard errors that are clustered by school-year.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