

The Effectiveness and Retention of Teachers with Prior Career Experience

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Abstract

This paper compares the retention and effectiveness of teachers with substantial prior work in non-teaching careers to those of other new teachers in New York City. We find that teachers with prior careers are less positive about their decision to become a teacher than are other teachers, but we see only small differences in attrition behavior after their first and second year of teaching. The results for effectiveness at improving student test performance are clearer. Teachers with prior work experience add less to the learning of their students in both English Language Arts and Math in their first year teaching. The patterns are less consistent in their second year of teaching. [JEL Classification: I20, I21]

Key words: human capital, productivity

1. Introduction

Mid- and second-career professionals willing to transition into teaching represent a potential pool of highly skilled teachers. These recruits offer the promise of practical experience and substantive knowledge; however, there is little evidence addressing the effectiveness of these potential teachers compared to teachers with no prior work experience, nor their relative likelihood of remaining in the teaching profession after the first few years (Haselkorn & Hamerness, 2008; Johnson & Birkeland, 2003; Johnson, 2004). Representatives of states and school districts provide anecdotal accounts that career-switchers offer an important pool of highly skilled and motivated teachers (Jacobson, 2007). Some studies indicate that teachers with prior career experience in particular content areas, such as science, have strong theoretical and practical knowledge bases in the content areas in which they want to teach (Bennett, 1991; Bullough & Knowles, 1990; Powell, 1992, 1994). Yet, other research shows that content knowledge and experience do not necessarily translate into effective teaching (see, for example, Bransford, Brown, & Cocking, 2000; Shulman, 1986, 1987). Previous research explored perceptions of teachers with prior career experience, but, to date, we know of no large-scale quantitative studies of the effects of teachers with different levels of prior career experience on student performance. This paper uses data on New York City teachers and students to describe the relationship among teachers' prior work experience, their effectiveness at increasing student test scores, and their attrition behavior.

2. Previous research

There are reasons to believe that teachers with prior work experience are either better or worse, on average, than other teachers. They may be better because their experiences provided them with knowledge and skill useful in the classroom. They may be worse because their prior

experiences and the skills for which they were rewarded in their prior jobs are so different than work in a classroom that the transition proves far more difficult than they expected.

Effectiveness may also depend on the type of prior experience, translation of knowledge and skills to the classroom, and preparation and support they begin their new career as a teacher. Zientek (2007), for example, studied a sample of novice teachers (within their first 3 years of teaching) in Texas and report no overall relationship between prior career experience and teachers' sense of preparedness. However, there are differences when looking at particular types of prior career experience. Respondents with prior career experience as administrators or in customer service industry indicate that they felt more prepared to teach compared to respondents with prior career experience as engineers, mathematicians, or computer scientists which suggests differences between novice teachers with prior career experiences in terms of the degree to which they are able to transfer their prior experiences to the classroom.

The transferring of knowledge and skills from prior career experiences to teaching has been explored by several studies (Chambers, 2002; Crow, Levine, and Nager, 1990; Mayotte, 2003; Powell, 1997; Resta, Huling, & Rainwater, 2001). As an example, Crow, Levine, and Nager (1990) interviewed students in a one-year, preservice master's degree program in teacher education at Bank Street College of Education. Thirteen of the fifteen students in the program left other occupations to become a teacher. These student experiences and perceptions helped identify three career change profiles: homecomers, converted, and unconverted. These profiles are based on the perceived importance of prior career experiences and the extent to which teaching was expected to provide a satisfying alternative. This case study suggests that prior experience is an important consideration how well teachers are able to transfer their knowledge and skills to their new occupations. Mayotte (2003) studied the perceptions of four second-year

teachers with prior career experience focusing on the influence of their previous careers on their classroom practice. The teachers indicated that simply having prior career experiences was not sufficient for a successful transition into their new career as a teacher.

Haselkorn and Hammerness (2008) summarize the literature addressing targeted preparation and support for teachers with prior work experience. They find tremendous variability in the demographic characteristics, motivations for choosing teaching, academic qualifications, and work experiences for prior career teachers. An example of this variability is described in a case study by Morton, Williams, & Brindley (2006) of career switchers pursuing a master of arts in teaching. One career changer had an undergraduate degree in science and worked as a researcher before becoming a teacher. While this career changer felt confident teaching science she needed help with language arts. Another career changer had a prior career in marketing. The authors describe this career changer's "relaxed attitude" --possibly encouraged by previous career experiences in which "he had a great deal of flexibility in his daily routine" (p. 43) -- in conflict with school norms. This career changer left school grounds during lunch to purchase tickets for a basketball game and read the newspaper in the morning while the students were arriving.

These varied experiences of career changers are likely to imply that prior-career teachers (like all other teachers) vary in the difficulty of transition into teaching and in their effectiveness in the classroom. Yet, there still may be meaningful average differences between those who have and have not had careers in other occupations before entering teaching; and these average differences provide evidence useful for those working to recruit the best teachers for their schools. To our knowledge, there have been no studies that have estimated the relationship

between prior careers and either teacher attrition or student achievement. However, there have been studies that shed light on these relationships.

Johnson and Birkeland (2003) surveyed fifty new teachers in the Massachusetts public schools in 1999 and 2001 and found that first-career teachers, female teachers, and those with traditional preparation were more likely to remain in public school teaching than mid-career entrants, men, or those who entered teaching through an alternative preparation program. Mid-career entrants were more than three times as likely as their first career counterparts to move from one school to another. Their interviews suggest that these retention differences may be due to prior-career entrants being less tolerant of schools that did not support good teaching. One woman, a 31 year old former engineer who decided to leave teaching, said “I’d been a professional. I’ve had plenty of really fine professional occupations, and I know what it is, and this is not it, and I can’t stand being treated so unprofessionally.” She held high standards of professionalism and was therefore less willing to put up with poor treatment.

There is also some evidence on differential retention by the age of entry for teachers. While age of entry and prior career experience are by no means perfectly correlated, prior-career teachers do tend to be older at entry. Feistrizzer (2005) surveyed individuals entering teachers through alternative routes in Texas, Florida, the Troops to Teachers program, the Milwaukee Teacher Education Center program, and the New York City Teaching Fellows program in 2004-05 (n=2,647). Respondents were asked what they expect to be doing 5 years from now and how long they plan to teach in K-12. The study finds that respondents over 30 years old much more likely to plan on remaining in teaching for at least five years (68 percent) compared to teachers either under 24 (48 percent) or 25 to 29 (51 percent).

In addition to teacher characteristics, such as age, teacher are more likely to leave schools with particular characteristics such as schools with high poverty, high minority student populations, and low student achievement for more economically advantaged and higher achieving schools (see for example, Elfers, Plecki, & Knapp, 2006; Goldhaber, Gross, & Player, 2007; Hanushek, Kain, & Rivkin, 2004; Lankford, Loeb, & Wyckoff, 2002). These characteristics provide a description of the types of schools that teachers leave and where they move, but are not necessarily the reason or cause for their departure (see for example, Loeb, Darling-Hammond, & Luczak, 2005). Research also suggests that there are multiple reasons why teachers decide to leave (see for example, Guarino, Santibanez, & Daley, 2006; Johnson, Berg, & Donaldson, 2005). A study by Ingersoll (2001) uses responses from a nationally representative sample of teachers and controls for teacher characteristics such as gender and age and school characteristics such as size and level of poverty to predict teacher turnover. Ingersoll also includes four organizational factors: salary, administrative support, student discipline problems and faculty influence. He finds that these organizational factors predict teacher retention decisions after controlling for teacher and school characteristics. A meta-analysis conducted by Borman & Dowling (2008) provides additional evidence that teacher and school characteristics are important considerations in addressing issues of teacher retention. Analysis of the reasons for teacher retention decisions requires an approach that disentangles teacher characteristics, school characteristics and organizational factors.

In addition to varying on propensity to stay in teaching, teachers with and without prior work experience may vary in how effective they are at improving student achievement. There are a number of ways to assess effectiveness. Clewell and Villegas (2001), for example, in the closest study we have found to one assessing the effectiveness of career changers, administered

surveys to field experience supervisors and principals, asking them to rate teachers around “organizing content knowledge for student learning, creating an environment for student learning, teaching for student learning, and professionalism.” They find that teachers who participated in the Pathways to Teaching Careers Program, a program aimed at recruiting para-professionals, un-certified teachers and Peace Corps volunteers, ranked higher than other teachers. This research, however, is not a direct study of prior career teachers. In addition, effectiveness is measured by adult rankings instead of by student learning, a potentially more accurate measure of effectiveness. In this study, we use value-added models of student achievement to assess teaching effectiveness; while, in themselves, far from perfect, they have the advantage of providing a direct link between students and teachers.

Value-added models comprise a set of quantitative approaches to estimating the effects of teachers on student achievement (for reviews see Bracey, 2006; Choi, Goldschmidt, & Yamashiro, 2005; Lissitz, 2005; McCaffrey, Lockwood, Koretz, & Hamilton, 2004; Meyer, 1997). McCaffrey, Lockwood, Koretz, & Hamilton (2003) describe these models as “any educational achievement model that uses gain scores or regresses current scores on prior scores” (p. 17). The range of models differ in terms of how value-added is defined, what data are needed to run the models, and what assumptions about the data and modeling are made. However, across a range of models it is clear that some teachers consistently show greater learning gains than others (Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004; Wright, Horn, & Sanders, 1997).

It is generally less clear which teacher characteristics are associated with better student outcomes, and because of this, it is not *ex ante* clear whether prior career applicants will be a good source of high quality teachers. Teacher experience is consistently associated with value-added. First year teachers (and to a lesser extent second and third year teachers) produce student

achievement gains that are from .03 to .20 standard deviations less than otherwise similar teachers with ten to fifteen years of experience (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004). Teachers' own test performance and the competitiveness of their undergraduate institutions also tend to be associated with greater value added to student achievement, but these effects are small in most studies (Hanushek, 2005). At least in some states, certified teachers also are more effective than uncertified teachers with the difference estimated at about half the size of the effect of a first year teacher in comparison to a second year teacher (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2008).

This study compares the retention and effectiveness of teachers with substantial prior work in non-teaching careers to those of other new teachers in New York City. We find that teachers with prior careers are less positive about their decision to become a teacher than are other teachers, but we see only small differences in attrition behavior during their first and second year of teaching. The results for effectiveness at improving student test performance are more clear. Teachers with prior work experience add less to the learning of their students in both English Language Arts and Math in their first year teaching. The patterns are less consistent in the second year of teaching.

3. Data and methodology

3.1 Data

In the spring of 2005 we administered a survey to all first year teachers in New York City (Teacher Policy Research, 2005). The survey contained over three hundred questions divided into areas such as preparation experiences, characteristics of the schools in which they are teaching, teaching practices, and goals. Participation in the survey was voluntary and was

estimated to take approximately 25 minutes to complete. The survey was completed by 4,360 teachers (over a 70% response rate), who received \$25 for participating.

The survey asked teachers how long they worked in *a profession other than teaching* full-time after completing their undergraduate degree: not at all, less than one year, one to two years, three to five years, or six or more years. Based on their responses to this item, we categorized teachers into three groups: no prior experience, some prior experience (one to five years), and lots of prior experience (six or more years). A little less than half of the teachers indicated that they had no prior work experience (46 percent, $n = 1,837$). Thirty-five percent indicated that they had some prior experience ($n = 1,414$) and the remaining 19 percent ($n = 756$) indicated that they had more than six years of prior work experience.

In addition to using teachers' survey responses to create our main variables of interest – prior work – we also use survey responses to describe the teachers in the sample and to see how the characteristics of teachers differ among those with different amounts of prior work experience. In particular, we use responses to the survey items pertaining to teacher preparation, knowledge/beliefs, job selection, and background.

We match survey respondents to administrative information provided by the New York City Department of Education (NYCDOE) and New York State Department of Education (NYSED) using unique teacher identification numbers. The data included information on the teachers, their students and their schools. In this matching process we lost 57 teachers so that the final sample included 4,303 first year teachers during the 2004-05 academic year.

The administrative data on teachers included demographic (gender, ethnicity, age), background (initial pathway into teaching and certification exam scores), and retention data from NYCDOE and NYSED. We define teachers' initial pathway into teaching using five categories:

college recommended, temporary license, New York City Teaching Fellows (NYC Teaching Fellows, 2007), Teach for America (Teach for America, 2006), and other. This information came from an analysis of teacher certification application data maintained by the NYSED on whether an individual had completed a college recommended teacher preparation program and the level of degree obtained and from the New York City Teaching Fellows program and Teach for America. A temporary license pathway indicates that the individual failed to complete one or more requirements for a teaching certificate but was allowed to teach under the temporary license provisions, whereby a school district can request NYSED to allow a specific individual to teach in a specific school for a temporary period. The other category includes all other pathways to teaching such as internship certificates, and those with certification through reciprocity agreements with other states.

As part of New York State certification requirements, teachers must pass the Liberal Arts and Science Test (LAST) which consists of a multiple-choice component and written component that are intended to “measure knowledge and skills in the liberal arts and sciences, in teaching theory and practice, and in the content area of the certificate title” (NYSED, 2008). There are five sub-areas within the liberal arts and sciences multiple-choice component: scientific, mathematical, and technological processes; historical and social scientific awareness; artistic expression and humanities; communication and research skills; and written analysis and expression. The written component requires test takers to prepare a written response to an assigned topic which is judged on focus and unity; appropriateness; reason and organization; support and development; structure and conventions (Pearson Education, 2006). Scores on the LAST exam and whether teachers passed the multiple-choice and written component on their first attempt were used in these analyses.

To measure retention, we created variables that identify for each year whether the teacher will be in the same school in the following school year, will have transferred to another school within New York City, or will have left teaching in the New York City public school district. Teachers who left New York City were not in the administrative data files for the following year but it is possible that these teachers remained in teaching in a school not in the New York City Public School system.

Data on students include annual student achievement tests administered in English Language Arts (ELA) and Math to all students in New York City, and other demographic information such as gender, ethnicity, language spoken at home, free lunch status, attendance, and number of suspensions. The analyses on student achievement for this particular study focused on the 2004-2005 school year and 2005-2006 school year. Data on students were excluded if the student took a test for the same grade two years in a row, if the student skipped a grade, or was part of a classroom with fewer than 10 students, or greater than 50 students.

We use data on the characteristics of schools to provide a context for these analyses. School characteristics included similar demographic information as the student and teacher data such as ethnicity, free lunch status, total enrollment, number of suspensions, and also included information on attendance rates, the number of violent crimes and the average expenditures for pupil. We compare these first year teachers with different levels of experience across all of these different school variables. Based on significant differences between groups, a few of the variables (ethnicity, percent receiving free lunch, and total enrollment) were selected as controls for the analysis on teacher retention and teacher effects on student achievement.

3.2 Methodology

The analyses address three questions: how do characteristics of teachers with different levels of prior work experience compare; do retention decisions of teachers differ depending on their level of prior work experience; and are teachers with greater prior work experience more or less effective at improving the learning of their students? The first set of analysis provides descriptive information comparing teachers with different levels of prior work experience in terms of their responses to the survey items on their preparation experiences, knowledge and beliefs, job selection, and background. We also explore whether there are differences in the school characteristics for teachers with different levels of prior work teach at during their first year of teaching.

The next set of analyses uses multinomial logistic regressions to estimate the relationship between prior work experience and teacher retention. The dependent variable is a three level measure indicating whether in the following school year, the teacher (1) stayed at the same school, (2) transferred to another school within New York City, or (3) left New York City. To separate the effect of prior work experience from other characteristics of teachers, the models control for initial pathway into teaching, gender, ethnicity, and whether they passed the LAST exam on their first attempt. Teachers with prior work experience may teach in schools that differ systematically from the schools in which others teach. Thus the models control for factors that could both differ by prior work and affect retention – the proportion of student eligible for free lunch, student ethnicity, and enrollment.

The third and final set of analyses assesses the differences in teachers' value-added to student learning. These analyses are limited to the subgroup of first year teachers who taught students who took the State exams in grades four through eight in Mathematics or English Language Arts. We estimate a standard value-added model with the achievement of a student in

a particular year with a particular teacher at a particular school as a function of his or her prior achievement, time varying and fixed student characteristics, characteristics of the classroom, characteristics of the teacher, fixed school effects, and a random error term. Student characteristics include race and ethnicity, gender, eligibility for free or reduced-price lunch, whether or not they switched schools, whether English is spoken at home, status as an English language learner, the number of school absences in the previous year, and the number of suspensions in the previous year. This model is similar that found in Boyd, Grossman, Lankford, Loeb, & Wyckoff (2008) and Clotfelter, Ladd, & Vigdor (2008).

We consider a student to have value-added information in cases where a score in a given subject (ELA or Math) for the current year and a score for the same subject in the immediately preceding year for the immediately preceding grade is available. Classroom variables include averages of all the student characteristics, class size, grade, and the mean and standard deviation of student achievement in the prior year. To separate selection effects of particular pathways, we controlled for initial teacher characteristics including gender, race and ethnicity, whether they passed LAST on the first attempt, and their score on that exam. Specification checks for these school fixed effects models were carried out using a random effects model with school controls, and ordinary least squares model with school controls.

4. Results

4.1 Teacher characteristics

As shown in Table 1, teachers with different levels of prior work experience have different demographic characteristics. However, many of these differences are predictable. To start with, teachers with prior career experience are older. Posthoc comparisons using the Bonferroni criterion for significance indicated that teachers with six or more years of prior career experience

were significantly older than teachers with no prior career experience, and teachers with some prior career experience ($p < .001$). Those with some prior work experience are also significantly older than those without prior career experience ($p < .001$). Teachers with no prior work experience or some prior work experience are more likely to have never been married and less likely to be responsible for any children compared to teachers with lots of prior work experience.

There are also differences in the characteristics of teachers in terms of gender, ethnicity, whether they passed the LAST exam on the first attempt, and pathway into teaching as shown in Table 1. Teachers with no prior or some prior career experience were more likely to be female and less likely to be African American compared to teachers with lots of prior work experience. A greater percentage of teachers with no prior work experience (43 percent) had an undergraduate major in education compared to teachers with some (15 percent) or lots (8 percent) of prior work experience. There were statistical but not practical differences in terms of the percent of teachers who took pre-calculus or calculus in high school and no statistical or practical differences in terms of other math courses such as geometry or algebra.

Teachers with lots of prior work experience are more likely to enter teaching through the NYCTF pathway and less likely to enter through the Teach for America pathway compared to teachers with no or some prior experience. Teachers with no or some prior experience were more likely to enter teaching through a college recommended program (50 v. 37 v. 31 percent). While there are no statistically significant differences in the retention decisions of teachers with different levels of prior work experience, this study included controls for other factors that influence such decisions such as school characteristics.

There were several differences in terms of teacher preparation experiences. Almost 80 percent of teachers with no prior work experience fulfilled their requirements to becoming

teachers by attending a full-time program compared to teachers with little or lots of experience tending to fulfill their requirements through part time programs or a combination of full and part-time programs (Table 1). Teachers with some or lots of prior career experience were more likely to participate in alternative certification programs compared to teachers with no prior career. Most of the teachers in this sample did not have prior teaching experiences as a full or part time teacher of their own classroom or as a substitute teacher before entering their teaching job in New York City. Approximately 90 percent of the teachers indicated that they did not have any prior teaching experience as a full time public or private school teacher of their own classroom in the USA or outside the USA and 59 percent had no full or part time substitute teaching experience (data available upon request).

Although there are statistically significant differences in teacher responses regarding their opportunities prior to becoming a full-time classroom teacher, these differences are not practically significant. Responses on a five point Likert scale ranging from none to extensive opportunity. For example, as shown in Table 2, there are similar levels of opportunities to learn how to fill out an Individual Education Plan or consider the relationship between education and social justice and/or democracy regardless of the level of prior work experience. Reflecting on their different experiences, there are also no practical differences in the responses for teachers with different levels of prior work experience. Here we see similar levels of observing excellent teachers and getting useful feedback about their teaching. These survey responses do not indicate differences between teachers with different levels of prior work in terms of their teacher preparation program experiences.

Overall, there are many similarities between teachers with various levels of prior experience in terms of their beliefs about education and preferences for the characteristics of

schools they prefer to teach in. There are statistical but not necessarily practical differences in teacher responses to items pertaining to whether they emphasize particular topics in their instruction. As Table 3 indicates, teachers with no prior experience indicated that they placed great emphasis on citizenship, work habits, human relations and character education compared to teachers with some and lots of prior work experience. The degree of these differences and how these differences translate to differences in educational opportunities for students are not clear.

There are some significant differences in the types of schools that teachers with different levels of prior work experience teach at during their first year in New York City. Posthoc comparisons using the Scheffe criterion indicated that teachers with lots of prior work experience teach at schools with fewer Asian students, more African American students, more suspensions, and violent crimes compared to teachers with no prior work experience, as can be seen in Table 4. Teachers with no prior work experience teach at schools with a greater percentage of English language learners compared to teachers with some prior experience and lots of prior experience. Teachers with prior work experience teach at schools containing similar percentages of white students and Hispanic students. They also teach at schools with similar total enrollment to the schools of teachers with no prior work experience. We use these school variables in the analysis on retention and student achievement to control for differences in working conditions.

4.2. Retention Patterns

On the survey, we ask teachers the extent to which they agree with statements about their career decisions given their present knowledge. Table 5 shows that teachers with lots of prior career experience were more likely to agree or strongly agree that they would not become a teacher if they had to do it again and were less likely to want to choose the same route into teaching. As shown in Table 1, we do not find significant differences in on retention decisions

after their first year of teaching related to prior work experience, though there were some suggestive differences. In particular, the differences that do exist are most noticeable in the likelihood of transferring within NYC, where 9 percent of those with no prior experience transfer while 13 percent of those with lots of prior experience do so (this comparison is significant at the $p < .05$).

In order to analyze these differences more rigorously, we estimate a series of multinomial logistic regression models to investigate differences in teacher retention decisions. The first model does not include any controls for schools or teachers. The second model includes school variables. The third and final model includes school and teacher variables. The numbers presented in Table 6 are relative risk ratios, which can be interpreted like odds ratios where a number greater than one indicates the degree of increased likelihood relative to teachers with no prior experience and a number less than one indicates the reduced likelihood relative to teachers with no prior experience (Table A1 gives full results). We estimate these regression models separately for retention decisions after the first year of teaching for the full sample of teachers, for teachers who entered through the NYCTF pathway and the college-recommended pathway. We focus on the NYCTF because of their program pathway targets teachers with prior career experiences and as a comparison to this group, we include teachers from the college-recommended pathway.

If we do not include any school or teacher controls, teachers with lots of prior work experience are more likely to transfer to another school within New York City compared to teachers with no prior experience. However, when we include controls for the characteristics of the schools the results are no longer statistically significant and the point estimate for the odds ratio gets closer to one. In other words, if we consider the types of schools, and teacher

demographics such as gender ethnicity and teacher experiences such as pathway into teaching, there are no differences in whether teachers decide to stay at the same school after their first year of teaching, transfer to another school within New York City or leave New York City.

Table 6 also presents the results separately for Teaching Fellows and teachers who obtained certification through college recommendation and here we see some differences. After controlling for teacher and school characteristics, NYCTF with prior experience were less likely to leave New York City rather than stay at the same school after their first year of teaching compared with similar teachers with no prior career experience. There is no indication of this relationship for college recommended teachers; in fact, for our sample college recommended, teachers with more prior experience were more likely to leave, but this difference is not statistically significant. We estimate a similar set of analysis for teacher retention decisions after their second year of teaching and find that after controlling for school and teacher characteristics, there are no significant differences in terms of retention decisions for either the NYCTF or college recommended pathway teachers (Table A2).

In summary, while prior career teachers are more likely to say that they would not become a teacher if they had the decision to make over again, we find only small differences in attrition associated with prior work once we control for other teacher and school characteristics.

4.3 Student outcomes

We estimate the effects of teachers with different levels of prior work experience on student achievement in math and ELA using a random effects model that included controls for school, teacher, classroom, and student characteristics. Table A3 shows the descriptive statistics

for the variables included in the analyses.¹ We compare prior work experience using three dummy variables which describe the number of years of prior work experience. We present the results for models that include two of the three dummy variables: some prior work experience (less than six years) and lots of prior work experience (six or more years).² We estimate the models separately for the effects on student achievement after one year and again for the effects of student achievement after two years. Each model includes only one year of student outcome data. The standard errors for these random effects models are clustered at the teacher level to take into account the hierarchical nature of the data. To check our models, we estimate a school fixed effects regression model, random effects model with school and teacher controls, and ordinary least squares model with school and teacher controls. The pattern of results is similar across these different models, as shown in Table 7 (Tables A4-A6). We focus the presentation of results and discussion around the random effects regression model with school and teacher controls (i.e. the most common Hierarchical Linear Model approach).

Table 7 indicates that teachers with lots of prior work experience are less effective than other teachers in increasing student ELA and Math test performance during their first year of teaching. These differences are not small (.04 to .12) relative to relationship between student achievement and other teacher attributes. For example, first year teachers, on average, have students who learn approximately .04 standard deviations less during the year than do students of second year teachers. These negative effects mitigate in the second year. We see little difference

¹ While the teachers included in the student outcome analysis only a subset of the total number of teachers who were included in the survey or retention results, the retention and survey descriptive analysis on this particular group of teachers indicate are similar to the full sample of teachers.

² Instead of including dummy variables for some and lots of prior experience, we also ran models that used only a variable for no prior experience. Results of these models were similar in retention decisions and effects of teachers on student outcomes.

by prior experience in effectiveness during the second year of teaching for ELA though some of the negative relationship remains in Math.

We ran additional models estimating the relationship between student learning and prior experience separately for college recommended teachers and teaching fellows. The second and third columns of Table 7 give these results for Math and the fifth and sixth columns give the results for ELA. Interestingly, the negative results for math are concentrated in the group of teachers who received certification through college recommendation, while the negative results for ELA are concentrated within the group of teaching fellows.

Two teacher characteristics, age and pathway, significantly relates to student outcomes. As an additional check, we include both variables in the models given in Table A7. We do not see any significant relationships between prior work and student ELA gains but observe negative effects for teachers with lots of prior work experience for first year math achievement. This negative effect disappears in their second year of teaching for the full sample and college recommended teachers but there seems to be a negative effect in their second year of teaching for NYCTF.

In summary, we find no positive effects of prior career teachers in either their first or second year and, in fact, find that these teachers tend to add less to student achievement gains during their first year of teaching. This result is consistent across a wide range of models. The negative effects in Math are concentrated among college recommended teachers, while the negative effects in ELA are concentrated among participants in the New York City Teaching Fellows program.

5. Conclusions

Teachers with prior work experience represent a potentially important pool of recruits. Their substantive knowledge and broad experiences make them appealing candidates. However, little prior research has systematically assessed differences in effectiveness or attrition between teachers who enter teaching from other careers and those who do not. In our sample, New York City teachers with prior career experience are older and enter through alternative routes more frequently. Compared to teachers with some or no prior work experiences, teachers with substantial experience show little difference in attrition during their first or second year, though they did express less happiness with their original decision to become a teacher. We find evidence, however, that during their first year, prior career teachers, on average, are less effective at improving student test performance in both English language arts and Math than are other teachers.

We only have value-added data for Math and ELA in grades four through eight, so it is possible that prior career experience is more helpful to teachers in different subjects and grade levels. For example, career changers with an undergraduate degree in science and applied science research experience might be more effective in teaching secondary science compared to career changers without similar characteristics and experiences. Having more detailed information about their experiences and relevant student outcome measures allows us to say more about the effectiveness of career changers on different subjects and grade levels. However, while the results do not provide perfect evidence on the relative effectiveness of prior career teachers, they raise concerns that these teachers, in particular, may be having difficulty transitioning to classroom.

Appendix

Table A1

Sample multinomial logistic model for teacher retention after first year of teaching

	<i>Transferred</i>	<i>Left NYC</i>
Some prior	0.88 (0.14)	1.10 (0.21)
Lots prior	0.79 (0.20)	1.01 (0.34)
School: Free lunch	0.98* (0.01)	0.99 (0.01)
School: African American	1.02* (0.01)	1.02* (0.01)
School: Hispanic	1.02* (0.01)	1.02* (0.01)
School: Total enrollment	1.00 (0.00)	1.00 (0.00)
School: Total enrollment squared	1.00 (0.00)	1.00 (0.00)
Pathway: Independent evaluation	1.24 (0.35)	1.65+ (0.47)
Pathway: NYC Teaching Fellows	1.75* (0.32)	0.80 (0.21)
Pathway: Teach for America	0.96 (0.31)	0.47+ (0.21)
Pathway: Temporary License	0.00* (0.00)	3.19 (2.57)
Pathway: Other	1.64+ (0.42)	2.21* (0.65)
Teacher: Female	0.63* (0.10)	0.86 (0.17)
Teacher: African American	0.61+ (0.16)	0.56+ (0.17)
Teacher: Hispanic	0.93 (0.21)	0.66 (0.20)
Teacher: Other ethnicity	1.07 (0.26)	0.43+ (0.19)
Teacher: Passed LAST exam on first attempt	1.22 (0.40)	2.26+ (1.01)
Teacher: LAST exam score	1.00 (0.00)	1.00 (0.00)
Teacher: Age	1.02* (0.01)	1.01 (0.01)

Relative risk ratios (standard errors in parentheses) where comparison group is “stay in same school.”

Table A2
Teacher retention after second year of teaching

	<i>No Controls</i>	<i>School Controls</i>	<i>School & Teacher Controls except age</i>	<i>School & Teacher Controls includes age</i>
Transferred				
Some prior	1.12 (0.22)	1.11 (0.22)	0.97 (0.20)	0.96 (0.20)
Lots prior	1.02 (0.27)	0.97 (0.25)	0.82 (0.23)	0.76 (0.29)
Left New York City				
Some prior	0.83 (0.11)	0.82 (0.11)	1.10 (0.17)	1.18 (0.19)
Lots prior	0.62* (0.13)	0.60* (0.12)	0.94 (0.20)	1.49 (0.43)
<i>N</i>	1980	1980	1980	1980
New York City Teaching Fellows				
Transferred				
Some prior	0.78 (0.24)	0.79 (0.25)	0.82 (0.27)	0.80 (0.26)
Lots prior	0.58 (0.23)	0.57 (0.22)	0.57 (0.23)	0.49 (0.29)
Left New York City				
Some prior	0.76 (0.19)	0.77 (0.20)	0.78 (0.21)	0.82 (0.23)
Lots prior	0.63 (0.21)	0.63 (0.22)	0.67 (0.24)	0.84 (0.44)
<i>N</i>	550	550	550	550
College Recommended				
Transferred				
Some prior	0.86 (0.29)	0.90 (0.31)	0.84 (0.30)	0.80 (0.30)
Lots prior	1.77 (0.72)	1.82 (0.74)	1.75 (0.75)	1.36 (0.72)
Left New York City				
Some prior	1.46 (0.33)	1.47 (0.34)	1.45 (0.34)	1.49 (0.36)
Lots prior	1.65 (0.53)	1.45 (0.49)	1.42 (0.51)	1.69 (0.74)
<i>N</i>	955 1.46 (0.33)	955 1.47 (0.34)	955 1.45 (0.34)	955 1.49 (0.36)

Relative risk ratios (standard errors in parentheses) where comparison group is “stay in same school.”
* $p < 0.05$.

Table A3

Descriptive statistics for teachers included in the student outcome analyses

<i>Teachers</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Age	817	30.86	7.65
Female	817	0.83	0.38
African American	793	0.13	0.34
Hispanic	793	0.08	0.27
White	818	0.10	0.19
Other Non-White race/ethnicity	793	0.05	0.21
LAST passed on first attempt	818	0.90	0.30
LAST score	798	256.39	26.05
Pathway: College Recommended	802	0.53	0.50
Pathway: NYC Teaching Fellows	802	0.23	0.42
Pathway: Teach for America	802	0.09	0.29
Pathway: Temporary License	802	0.01	0.08
Pathway: Individual Evaluation	802	0.08	0.28
Pathway: Other	802	0.06	0.24
Retention: Same school within NYC	702	0.79	0.38
Retention: Different school within NYC	702	0.11	0.29
Retention: Left NYC	702	0.10	0.28
<i>Students</i>	<i>N</i>	<i>M</i>	<i>SD</i>
ELA standardized score	39,521	-0.09	0.95
Math standardized score	42,764	-0.09	0.95
Female	42,851	0.51	0.50
Asian	42,851	0.13	0.34
African American	42,845	0.31	0.46
Hispanic	42,848	0.42	0.49
Other Non-White race/ethnicity	42,847	0.01	0.07
Free lunch	45,852	0.58	0.49
Reduced-price lunch	42,852	0.08	0.27
Missing free lunch information	42,852	0.22	0.41
English home language	42,852	0.56	0.50
Entitled to ELL per lab	42,852	0.10	0.31
Not entitled to ELL per IEP or Category U	42,852	0.00	0.03
ELL entitled per school	42,852	0.00	0.05
Days absent in previous year	40,983	11.90	11.96
Days suspended in previous year	40,983	0.02	0.18
<i>Classrooms</i>	<i>N^a</i>	<i>M</i>	<i>SD</i>
Asian	42,852	0.13	0.19
African American	42,852	0.31	0.30
Hispanic	42,852	0.42	0.29
Other Non-White race/ethnicity	42,852	0.01	0.02
Class Size	42,852	26.37	4.70
Free lunch	42,852	0.58	0.29
Reduced-price lunch	42,852	0.08	0.09

English home language	42,852	0.56	0.29
Entitled to ELL per lab	42,852	0.10	0.20
Days absent previous year	42,852	11.89	4.76
Days suspended previous year	42,852	0.02	0.05
Math scores from previous year	42,852	-0.02	0.59
ELA scores from previous year	42,244	-0.07	0.64
SD math scores from previous year	42,852	0.68	0.21
SD ELA scores from previous year	41,902	0.69	0.19

^aNumber of students.

Table A4
Sample random effects with school and teacher controls for math, year 1

Some prior	-0.00 (0.02)
Lots prior	-0.09** (0.03)
Lagged value of standardized math score	0.58*** (0.01)
Lagged value of standardized math score squared	-0.03*** (0.01)
Lagged value of standardized ELA score	0.13*** (0.01)
Lagged value of standardized ELA score squared	0.00 (0.00)
Changed schools	-0.05** (0.02)
Female	-0.01 (0.01)
Hispanic	-0.03 (0.02)
African American	-0.04* (0.02)
Asian	0.15*** (0.02)
Other ethnicity	0.09 (0.07)
Home language is English	-0.06*** (0.01)
Received free lunch	-0.02 (0.01)
Received reduced lunch	0.01 (0.02)
Missing information for free/reduced lunch	-0.02 (0.02)
ELL entitled per IEP or lab exam	-0.08** (0.03)
Not entitled to ELL per IEP or Category U	0.16 (0.08)
ELL entitled per the school	0.02 (0.11)
Days absent in previous year	-0.00*** (0.00)
Days suspended in previous year	-0.07 (0.04)
Math class: Asian	-0.20

	(0.11)
Math class: African American	-0.25*
	(0.10)
Math class: Hispanic	-0.23*
	(0.09)
Math class: Other ethnicity	-0.80
	(0.48)
Average math class size	-0.01**
	(0.00)
Math class: ELL entitled per IEP or lab exam	0.12
	(0.08)
Math class: received free lunch	-0.07
	(0.05)
Math class: received reduced lunch	0.28*
	(0.13)
Math class: home language is English	0.05
	(0.07)
Math class: days absent in previous year	-0.00
	(0.00)
Math class: days suspended in previous year	-0.35
	(0.19)
Math class: math standard scores from previous year	0.07*
	(0.04)
Math class: ELA standard scores from previous year	0.07*
	(0.03)
Math class: standard deviation of math scores from previous year	-0.05
	(0.04)
Math class: standard deviation of ELA scores from previous year	-0.06
	(0.05)
Grade 5	0.14***
	(0.03)
Grade 6	0.16***
	(0.03)
Grade 7	0.25***
	(0.04)
Grade 8	0.14**
	(0.04)
Teacher: Passed LAST exam on first attempt	-0.01
	(0.04)
Teacher: LAST exam score	0.00
	(0.00)
Pathway: Independent evaluation	-0.00
	(0.03)
Pathway: NYC Teaching Fellows	-0.02
	(0.03)
Pathway: Teach for America	0.02

	(0.04)
Pathway: Temporary License	-0.11
	(0.06)
Pathway: Other	-0.00
	(0.04)
Teacher: Female	0.02
	(0.02)
Teacher: African American	0.03
	(0.03)
Teacher: Hispanic	-0.02
	(0.03)
Teacher: Other ethnicity	0.02
	(0.04)
Teacher: Age	0.00
	0.00
School: Free lunch	-0.00
	(0.00)
School: African American	-0.00
	(0.00)
School: Hispanic	-0.00
	(0.00)
School: Total enrollment	0.00
	(0.00)
School: Total enrollment squared	0.00
	(0.00)
Constant	0.29
	(0.16)
	N
	16983
	Number of schools
	513
	chi2
	10962.49
	df_m
	57
	p
	0.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses.

Table A5
Sample school fixed effects with teacher controls for math, year 1

Some prior	-0.03 (0.03)
Lots prior	-0.13*** (0.03)
Lagged value of standardized math score	0.58*** (0.01)
Lagged value of standardized math score2	-0.03*** (0.01)
Lagged value of standardized ELA score	0.13*** (0.01)
Lagged value of standardized ELA score2	0.00 (0.00)
Changed schools	-0.03 (0.02)
Female	-0.01 (0.01)
Hispanic	-0.03 (0.02)
African American	-0.04* (0.02)
Asian	0.15*** (0.02)
Other ethnicity	0.08 (0.07)
Home language is English	-0.06*** (0.01)
Received free lunch	-0.01 (0.01)
Received reduced lunch	0.02 (0.02)
Missing information for free/reduced lunch	-0.01 (0.02)
ELL entitled per IEP or lab exam	-0.09** (0.03)
Not entitled to ELL per IEP or Category U	0.16 (0.09)
ELL entitled per the school	0.03 (0.10)
Days absent in previous year	-0.00*** (0.00)
Days suspended in previous year	-0.07 (0.04)
Math class: Asian	-0.21

	(0.17)
Math class: African American	-0.27*
	(0.13)
Math class: Hispanic	-0.20
	(0.11)
Math class: Other ethnicity	-1.02*
	(0.49)
Average math class size	-0.00*
	(0.00)
Math class: ELL entitled per IEP or lab exam	0.09
	(0.08)
Math class: received free lunch	-0.16*
	(0.08)
Math class: received reduced lunch	0.29
	(0.16)
Math class: home language is English	0.09
	(0.09)
Math class: days absent in previous year	-0.00
	(0.00)
Math class: days suspended in previous year	-0.27
	(0.19)
Math class: math standard scores from previous year	0.10*
	(0.04)
Math class: ELA standard scores from previous year	0.04
	(0.04)
Math class: standard deviation of math scores from previous year	-0.03
	(0.04)
Math class: standard deviation of ELA scores from previous year	-0.07
	(0.05)
Grade 5	0.14***
	(0.03)
Grade 6	0.22**
	(0.07)
Grade 7	0.33***
	(0.08)
Grade 8	0.23**
	(0.08)
Teacher: Passed LAST exam on first attempt	0.02
	(0.05)
Teacher: LAST exam score	-0.00
	(0.00)
Pathway: Independent evaluation	-0.01
	(0.03)
Pathway: NYC Teaching Fellows	0.02
	(0.03)
Pathway: Teach for America	0.11

	(0.08)
Pathway: Temporary License	-0.10
	(0.06)
Pathway: Other	0.03
	(0.04)
Teacher: Female	0.01
	(0.02)
Teacher: African American	0.04
	(0.03)
Teacher: Hispanic	-0.02
	(0.04)
Teacher: Other ethnicity	0.05
	(0.06)
Teacher: Age	0.00
	(0.00)
Constant	0.39*
	(0.17)
N	16983
Number of schools	513
r ²	0.55
df_m	52
ll	-12159.77
p	0.00

* $p < .05$, *** $p < .001$. Standard errors in parentheses.

Table A6
Sample OLS with school and teacher controls for math, year 1

Some prior	0.03** (0.01)
Lots prior	-0.00 (0.02)
Lagged value of standardized math score	0.58*** (0.01)
Lagged value of standardized math score squared	-0.03*** (0.00)
Lagged value of standardized ELA score	0.13*** (0.01)
Lagged value of standardized ELA score squared	0.00 (0.00)
Changed schools	-0.05*** (0.01)
Female	-0.01 (0.01)
Hispanic	-0.03 (0.02)
African American	-0.04* (0.02)
Asian	0.15*** (0.02)
Other ethnicity	0.09 (0.06)
Home language is English	-0.06*** (0.01)
Received free lunch	-0.03 (0.02)
Received reduced lunch	0.00 (0.02)
Missing information for free/reduced lunch	-0.04* (0.02)
ELL entitled per IEP or lab exam	-0.06* (0.03)
Not entitled to ELL per IEP or Category U	0.16 (0.20)
ELL entitled per the school	-0.07 (0.21)
Days absent in previous year	-0.00*** (0.00)
Days suspended in previous year	-0.07* (0.03)
Math class: Asian	-0.07

	(0.04)
Math class: African American	-0.18**
	(0.06)
Math class: Hispanic	-0.19***
	(0.06)
Math class: Other ethnicity	0.21
	(0.27)
Average math class size	-0.00***
	(0.00)
Math class: ELL entitled per IEP or lab exam	0.18***
	(0.05)
Math class: received free lunch	-0.01
	(0.02)
Math class: received reduced lunch	0.19**
	(0.06)
Math class: home language is English	0.08*
	(0.03)
Math class: days absent in previous year	-0.00
	(0.00)
Math class: days suspended in previous year	-0.49***
	(0.10)
Math class: math standard scores from previous year	0.05*
	(0.02)
Math class: ELA standard scores from previous year	0.13***
	(0.02)
Math class: standard deviation of math scores from previous year	-0.08***
	(0.02)
Math class: standard deviation of ELA scores from previous year	-0.00
	(0.03)
Grade 5	0.15***
	(0.01)
Grade 6	0.17***
	(0.02)
Grade 7	0.24***
	(0.02)
Grade 8	0.13***
	(0.02)
Teacher: Passed LAST exam on first attempt	-0.03
	(0.02)
Teacher: LAST exam score	0.00
	(0.00)
Pathway: Independent evaluation	0.00
	(0.02)
Pathway: NYC Teaching Fellows	-0.03*
	(0.01)
Pathway: Teach for America	-0.06**

	(0.02)
Pathway: Temporary License	-0.18***
	(0.04)
Pathway: Other	-0.02
	(0.02)
Teacher: Female	0.02*
	(0.01)
Teacher: African American	0.03**
	(0.01)
Teacher: Hispanic	-0.03
	(0.02)
Teacher: Other ethnicity	0.03*
	(0.02)
Teacher: Age	-0.00
	(0.00)
School: Free lunch	0.00***
	(0.00)
School: African American	-0.00
	(0.00)
School: Hispanic	0.00
	(0.00)
School: Total enrollment	0.00
	(0.00)
School: Total enrollment squared	-0.00
	(0.00)
Constant	0.14
	(0.08)
N	16983
r ²	0.66
df_m	57
ll	-12936.56
p	0.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses.

Table A7

Achievement models with school and teacher controls (includes age)

	<i>Math</i>			<i>ELA</i>		
	<i>Full</i>	<i>NYCTF</i>	<i>CR</i>	<i>Full</i>	<i>NYCTF</i>	<i>CR</i>
First Year – Random Effects						
Some prior	-0.00 (0.02)	0.03 (0.04)	-0.01 (0.04)	-0.01 (0.02)	-0.05 (0.03)	-0.01 (0.02)
Lots prior	-0.09** (0.03)	-0.05 (0.06)	-0.14** (0.05)	-0.03 (0.03)	0.02 (0.04)	-0.03 (0.05)
<i>observations</i>	16,983	6,339	7,098	16,118	4,252	7,852
Second Year – Random Effects						
Some prior	-0.02 (0.03)	-0.11 (0.06)	-0.01 (0.04)	-0.03 (0.02)	-0.02 (0.05)	-0.03 (0.03)
Lots prior	-0.08 (0.05)	-0.19* (0.08)	0.05 (0.09)	0.01 (0.03)	-0.14 (0.09)	0.06 (0.05)
<i>observations</i>	12,631	4,537	5,558	13,379	3,408	6,831
First Year – School Fixed Effects						
Some prior	-0.03 (0.03)	-0.01 (0.06)	-0.05 (0.05)	-0.02 (0.02)	-0.08 (0.07)	-0.06 (0.03)
Lots prior	-0.13*** (0.03)	-0.09 (0.09)	-0.14* (0.07)	-0.02 (0.03)	-0.01 (0.09)	0.02 (0.06)
<i>observations</i>	16,983	6,339	7,098	16,277	4,334	7,929
Second Year – School Fixed Effects						
Some prior	-0.04 (0.04)	-0.34*** (0.07)	0.05 (0.06)	-0.04 (0.03)	-0.11 (0.09)	0.05 (0.05)
Lots prior	-0.16* (0.07)	-0.42*** (0.11)	-0.14 (0.14)	-0.00 (0.04)	-0.47* (0.19)	0.10 (0.10)
<i>observations</i>	12,673	4,579	5,558	13,425	3,408	6,877
First Year - OLS						
Some prior	0.03** (0.01)	0.05* (0.02)	0.00 (0.02)	-0.01 (0.01)	-0.06** (0.02)	-0.01 (0.01)
Lots prior	-0.00 (0.02)	0.01 (0.03)	-0.07* (0.03)	-0.03 (0.02)	-0.00 (0.03)	-0.02 (0.03)
<i>observations</i>	16,983	6,339	7,098	16,118	4,252	7,852
Second Year – OLS						
Some prior	-0.01 (0.01)	0.06* (0.03)	-0.07*** (0.02)	-0.02 (0.01)	0.02 (0.03)	-0.05** (0.02)
Lots prior	-0.02 (0.02)	0.01 (0.04)	0.08* (0.04)	0.01 (0.02)	-0.11 (0.06)	0.09** (0.03)
<i>observations</i>	12,631	4,537	5,558	13,379	3,408	6,831

* $p < .05$, ** $p < .01$, *** $p < 0.001$. Standard errors in parentheses.

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Vitae

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Table 1

The characteristics of teachers by their prior career experience (percent)

	<i>Prior Career Experience</i>			$\chi^2(2, N=3,886)$
	None (<i>n</i> =1,837)	Some (<i>n</i> =1,413)	Lots (<i>n</i> =763)	
Age	28.60 (6.20)	30.18 (5.16)	42.65 (9.01)	
Female	81	75	65	76.57***
Race/Ethnicity: African American	10	13	15	13.40**
Race/Ethnicity: Hispanic	11	10	9	0.88
Race/Ethnicity: White	70	69	70	0.77
Race/Ethnicity: Other	9	8	5	11.27**
Married	15	20	50	364.90***
Not legally responsible for children	41	55	44	8.24***
Took Pre-algebra in high school	70	68	68	2.40
Took Geometry in high school	82	83	82	0.55
Took advanced Algebra in high school	66	67	67	0.61
Took Pre-Calculus in high school	57	56	43	48.90***
Took Calculus in high school	32	28	25	17.42***
Undergraduate major in education	43	15	8	500.01***
Passed LAST exam on first attempt	87	92	94	33.75***
Pathway: College Recommended	50	37	31	100.76***
Pathway: NYC Teaching Fellows	23	45	53	265.72***
Pathway: Teach for America	11	3	0	144.17***
Pathway: Temporary License	1	1	1	0.20
Pathway: Other	10	8	6	10.32**
Attendance: Attended only one	52	38	33	137.46***
Attendance: Attended mostly one	5	4	6	
Attendance: Attended two or more	7	5	7	
Attendance: Attended alternative	35	52	55	
Time Commitment: Full-time	78	68	56	126.51***
Time Commitment: Part-time	12	17	25	
Time Commitment: Mix	10	15	18	
Time to Completion: < 2 months	23	28	27	374.24***
Time to Completion: 2-11 months	13	22	28	
Time to Completion: 12-24 months	18	31	27	
Time to Completion: 36-48 months	30	11	12	
Time to Completion: > 48 months	16	7	7	
Stayed in same school	83	82	79	4.15
Transferred within NYC	9	10	13	5.85
Left NYC	8	8	8	0.09

Note. The values represent the percentage of teachers within each career experience category.

** $p < 0.01$, *** $p < 0.001$.

Table 2

Opportunities during teacher preparation program by prior career experience (percent)

	Prior Career Experience			<i>F</i>
	No Prior (<i>n</i> = 1,837)	Some Prior (<i>n</i> = 1,413)	Lots Prior (<i>n</i> = 763)	
Study stages of child development	3.24 (1.19)	2.92 (1.19)	2.86 (1.23)	41.32***
Develop strategies for handling student misbehavior	3.16 (1.08)	3.04 (1.06)	2.88 (1.12)	19.30***
Develop specific strategies for teaching ELL	2.32 (1.14)	2.15 (1.09)	2.01 (1.06)	22.22***
Develop specific strategies for teaching students identified with learning disabilities	2.92 (1.21)	2.69 (1.18)	2.42 (1.19)	46.90***
Develop specific strategies for teaching students from diverse racial and ethnic backgrounds	3.20 (1.16)	2.99 (1.18)	2.83 (1.20)	28.77***
Develop strategies for setting classroom norms	3.37 (1.08)	3.16 (1.08)	3.01 (1.14)	33.90***
Consider the relationship between education and social justice and/or democracy	2.87 (1.20)	2.60 (1.19)	2.54 (1.25)	28.91***
Learn how to fill out Individual Education Plans	2.34 (1.32)	2.14 (1.21)	2.05 (1.19)	22.61***
Observed excellent teachers and worthy role models	3.94 (1.23)	3.82 (1.21)	3.87 (1.19)	4.52
Regularly observed by supervisor, classroom teacher or fellow advisor	4.15 (1.10)	3.92 (1.27)	3.95 (1.21)	16.78***
Got useful feedback	4.00 (1.10)	3.81 (1.22)	3.84 (1.17)	12.63***
University supervisor, fellow advisor or institute faculty available to talk	4.21 (0.96)	4.09 (1.05)	4.08 (1.08)	7.60***
Able to try out new strategies and techniques	3.92 (1.07)	3.72 (1.20)	3.63 (1.24)	20.75***
Experience similar to current job in terms of grade level	3.47 (1.40)	3.43 (1.43)	3.32 (1.15)	3.03*
Experience similar to current job in terms of subject area	3.64 (1.34)	3.59 (1.41)	3.48 (1.43)	3.61*

Standard deviations in parentheses.

* $p < 0.05$, *** $p < 0.001$.

Table 3

Teaching emphasis on particular topics by prior career experience (percent)

	Prior Career Experience			$\chi^2(2, N=3,886)$
	No Prior (<i>n</i> = 1,837)	Some Prior (<i>n</i> = 1,413)	Lots Prior (<i>n</i> = 763)	
Basic skills	63	60	59	11.70
Mastery	35	34	36	4.00
Citizenship	24	21	18	45.68***
Workforce skills	15	18	19	9.94
Work habits	42	42	38	23.18**
Personal growth	39	42	37	29.92***
Human relations	44	45	39	30.97***
Character education	32	31	27	28.91***

^aProportion of teachers who indicated a great deal of emphasis on particular topic.

** $p < 0.01$, *** $p < 0.001$.

Table 4
School characteristics by prior work experience (percent with standard deviations below)

	<i>Prior Work Experience</i>			<i>F</i>
	None (<i>n</i> = 1,806)	Some Prior (<i>n</i> = 1,390)	Lots Prior (<i>n</i> = 737)	
Asian	12.10 (17.03)	11.80 (16.11)	9.80 (14.05)	3.43*
African American	30.51 (27.86)	31.74 (27.75)	36.52 (29.13)	7.77***
Hispanic	46.53 (26.88)	45.95 (26.28)	44.08 (26.56)	1.43
White	10.87 (18.52)	10.51 (18.01)	9.60 (16.51)	0.83
Free lunch	75.34 (19.51)	75.23 (19.24)	74.18 (19.84)	0.62
English language learner	16.18 (11.66)	15.16 (11.00)	14.07 (10.79)	6.49**
Total enrollment	865.17 (391.90)	858.29 (393.69)	887.97 (393.32)	0.88
Attendance rates	92.13 (2.39)	91.95 (2.75)	91.91 (2.12)	2.09
Suspensions	29.75 (47.82)	32.35 (49.73)	41.37 (50.93)	8.16**
Violent crime	0.18 (0.55)	0.26 (0.65)	0.30 (0.66)	7.41**

* $p < .05$, ** $p < 0.01$, *** $p < .001$.

Table 5

Reflections on teacher career decisions by prior career experience (percent)

	Prior Career Experience			$\chi^2(2, N=3,886)$
	No Prior (<i>n</i> = 1,837)	Some Prior (<i>n</i> = 1,413)	Lots Prior (<i>n</i> = 763)	
I would not become a teacher	12	10	14	24.03**
I would not choose the same route into teaching	17	19	22	33.21***
I would rather teach in a different school	29	30	31	19.43*
I am not as happy about teaching as I thought I would be	31	30	32	12.58

^a Percentage of teachers who indicated that they agree or strongly disagree with career decisions given present knowledge.

* $p < .05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6
Teacher retention after first year of teaching

	<i>No Controls</i>	<i>School Controls</i>	<i>School & Teacher Controls except age</i>	<i>School & Teacher Controls includes age</i>
Transferred				
Some prior	1.04 (0.16)	1.03 (0.16)	0.91 (0.15)	0.88 (0.14)
Lots prior	1.36* (0.25)	1.29 (0.24)	1.10 (0.22)	0.79 (0.20)
Left New York City				
Some prior	1.21 (0.22)	1.19 (0.22)	1.12 (0.21)	1.10 (0.21)
Lots prior	1.38 (0.32)	1.28 (0.30)	1.20 (0.31)	1.01 (0.34)
<i>N</i>	2205	2205	2205	2205
New York City Teaching Fellows				
Transferred				
Some prior	1.04 (0.29)	1.09 (0.30)	1.12 (0.31)	1.03 (0.29)
Lots prior	1.20 (0.39)	1.27 (0.41)	1.23 (0.40)	0.79 (0.38)
Left New York City				
Some prior	0.51 (0.21)	0.50 (0.21)	0.50* (0.21)	0.48* (0.21)
Lots prior	1.09 (0.43)	1.00 (0.40)	0.94 (0.37)	0.76 (0.51)
<i>N</i>	615	615	615	615
College Recommended				
Transferred				
Some prior	0.76 (0.19)	0.75 (0.19)	0.74 (0.19)	0.72 (0.19)
Lots prior	1.59 (0.47)	1.45 (0.46)	1.66 (0.55)	1.13 (0.42)
Left New York City				
Some prior	1.52 (0.45)	1.53 (0.46)	1.44 (0.44)	1.40 (0.43)
Lots prior	1.83 (0.68)	1.61 (0.62)	1.39 (0.57)	0.98 (0.48)
<i>N</i>	1045	1045	1045	1045

Relative risk ratios (standard errors in parentheses) where comparison group is “stay in same school.”

* $p < 0.05$.

Table 7

Achievement models with school and teacher controls (does not include age)

	<i>Math</i>			<i>ELA</i>		
	<i>Full</i>	<i>NYCTF</i>	<i>CR</i>	<i>Full</i>	<i>NYCTF</i>	<i>CR</i>
First Year – School Random Effects						
Some prior	-0.00 (0.02)	0.03 (0.03)	-0.01 (0.04)	-0.01 (0.02)	-0.07* (0.03)	-0.01 (0.02)
Lots prior	-0.08** (0.02)	-0.03 (0.04)	-0.10* (0.04)	-0.04* (0.02)	-0.08* (0.03)	-0.02 (0.04)
<i>observations</i>	16,983	6,339	7,098	16,118	4,252	7,852
Second Year – School Random Effects						
Some prior	-0.02 (0.03)	-0.05 (0.05)	-0.01 (0.04)	-0.02 (0.02)	0.02 (0.04)	-0.03 (0.03)
Lots prior	-0.07* (0.03)	-0.10 (0.05)	0.03 (0.06)	0.01 (0.03)	0.04 (0.04)	0.04 (0.05)
<i>observations</i>	15,269	6,099	6,267	15,026	4,050	7,657
First Year – School Fixed Effects						
Some prior	-0.03 (0.03)	-0.01 (0.06)	-0.05 (0.05)	-0.02 (0.02)	-0.15* (0.06)	-0.06 (0.03)
Lots prior	-0.12*** (0.03)	-0.04 (0.06)	-0.14* (0.06)	-0.05 (0.02)	-0.15* (0.06)	-0.00 (0.05)
<i>observations</i>	16,983	6,339	7,098	16,277	4,334	7,929
Second Year – School Fixed Effects						
Some prior	-0.03 (0.03)	-0.19*** (0.05)	-0.01 (0.06)	-0.02 (0.02)	0.05 (0.05)	-0.02 (0.05)
Lots prior	-0.11** (0.04)	-0.24*** (0.07)	-0.12 (0.08)	0.01 (0.04)	0.08 (0.06)	0.03 (0.08)
<i>observations</i>	15,311	6,141	6,267	15,072	4,050	7,703
First Year - OLS						
Some prior	0.03* (0.01)	0.04* (0.02)	0.01 (0.02)	-0.02 (0.01)	-0.08*** (0.02)	-0.01 (0.01)
Lots prior	-0.02 (0.01)	-0.01 (0.02)	-0.05* (0.02)	-0.04** (0.01)	-0.10*** (0.02)	-0.01 (0.02)
<i>observations</i>	16,983	6,339	7,098	16,118	4,252	7,852
Second Year – OLS						
Some prior	0.01 (0.01)	0.07*** (0.02)	-0.04* (0.02)	-0.02 (0.01)	0.03 (0.02)	-0.04* (0.02)
Lots prior	-0.02 (0.01)	-0.00 (0.02)	0.07* (0.03)	0.01 (0.02)	0.01 (0.03)	0.06* (0.02)
<i>observations</i>	15,269	6,099	6,267	15,026	4,050	7,657

* $p < .05$, ** $p < .01$, *** $p < 0.001$. Standard errors in parentheses.