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The Influence of School Administrators on Teacher Retention Decisions

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ABSTRACT

When given the opportunity, many teachers choose to leave schools serving poor, low-performing, and nonwhite students. While a substantial research literature has documented this phenomenon, far less research effort has gone into understanding what features of the working conditions in these schools drive this relatively higher turnover rate. This paper explores the relationship between school contextual factors and teacher retention decisions in New York City. The methodological approach separates the effects of teacher characteristics from school characteristics by modeling the relationship between the assessments of school contextual factors by one set of teachers and the turnover decisions by other teachers within the same school. Teachers' perceptions of the school administration have by far the greatest influence on teacher-retention decisions. This effect of administration is consistent for first-year teachers and the full sample of teachers and is confirmed by a survey of teachers who have recently left teaching in New York City.

INTRODUCTION

When given the opportunity, many teachers choose to leave schools serving poor, low-performing, and nonwhite students (Boyd et al. 2005; Hanushek, Kain, and Rivkin 2004; Scafidi, Sjoquist, and Stinebrickner 2005). While a substantial research literature has documented this phenomenon, far less research effort has gone into understanding what features of the working conditions in these schools drive this relatively higher turnover rate (see Loeb, Darling-Hammond, and Luczak 2005 for an exception to this). Excessive teacher turnover can be costly and detrimental to instructional cohesion in schools (National Commission on Teaching and America's Future 2003). Consequently, many policies, such as mentoring programs and retention bonuses, have aimed to stem teacher attrition, particularly at schools that experience high teacher turnover. Yet, without a better understanding of the reasons teachers leave, these approaches may not be as effective as they could be.

This study contributes to our understanding of teacher attrition by modeling the relationship between teacher turnover and school contextual factors, including teachers' influence over school policy, the effectiveness of the school administration, staff relations, student behavior, safety, and facilities. Using a unique dataset that combines longitudinal survey data with district administrative files, we find that school administration plays a particularly important role in teachers' career decisions. In what follows, we briefly review relevant prior research to motivate our study, describe our data and methods, and then present the results. The final section discusses the implications of these results, limitations of the study, and directions for future research.

BACKGROUND AND MOTIVATION

Across the United States, approximately half a million teachers leave their schools each year. Only 16 percent of this teacher attrition at the school level can be attributed to retirement. The remaining 84 percent of teacher turnover results from teachers transferring between schools and teachers leaving the profession entirely (Alliance for Excellent Education 2008). In New York City alone, over

5,000 teachers left their schools in 2005, with 8 percent of teachers transferring to another school and 10 percent leaving the New York City school system. Recent literature has begun to investigate the complexities of teacher turnover, making important distinctions such as among exits from teaching, transfers within districts, and transfers between districts as well as between teachers leaving permanently and those leaving and later returning (DeAngelis and Presley 2007; Johnson, Berg, and Donaldson 2005). In general, previous teacher retention research has focused either on the relationship between turnover and teachers' characteristics (i.e., what types of teachers are more likely to leave) or between turnover and school characteristics (i.e., what types of schools experience higher teacher turnover).

Teacher background characteristics and work experience consistently predict turnover. For example, turnover is higher among young and old teachers versus middle-aged ones (Guarino, Santibanez, and Daley 2006; Johnson et al. 2005); and among less experienced teachers versus more experienced ones (Ingersoll 2001; Marvel et al. 2006). The research linking teacher gender, race, or ethnicity to turnover is less consistent (Guarino et al. 2006; Johnson et al. 2005). Teachers' preparation experiences and pathways into teaching are also related to attrition behavior. On average, teachers from early-entry routes (such as Teach for America and the New York City Teaching Fellows) are more likely to leave than teachers from more traditional routes (Boyd et al. 2006). Finally, teacher quality measures have been linked with attrition behavior but somewhat inconsistently. Teachers with stronger qualifications, as measured by their test scores and the competitiveness of the undergraduate institution from which they received degrees, are more likely to leave teaching (Boyd et al. 2005). However, teachers who are more effective, as measured by the test score gains of the students in their classrooms, are less likely to leave teaching (Boyd et al. 2007; Goldhaber, Gross, and Player 2007; Hanushek et al. 2005).

Research on the relationship between teacher retention and school characteristics has focused primarily on measures of the school's student composition. Schools with large concentrations of low-income, nonwhite, and low-achieving students are the most likely to experience high teacher turnover (Boyd et al. 2005; Carroll, Reichardt, and Guarino 2000; Hanushek

et al. 2004; Scafidi et al. 2005). For example, in New York City, there is a 27 percent attrition rate of first-year teachers in the lowest performing schools compared with a 15 percent rate in the schools with the highest student achievement.

Some studies have examined the relationship between teacher turnover and school or district factors (Buckley, Schneider, and Shang 2005; Hirsh and Emerick 2006). Unlike the studies predicting turnover by student composition that use large, longitudinal datasets, most of these studies must rely upon surveys of teachers asking about their perceptions of working conditions and likelihood of leaving. These survey data likely produce less accurate models of teacher turnover because a teacher's report of working conditions could be affected by whether she or he plans to leave the school.

Some state databases are rich enough to model the relationship between teacher turnover and certain school or district factors. For example, Imazeki (2005) uses data from Wisconsin and finds that teacher retention is higher when salaries are higher. Loeb, Darling-Hammond, and Luczak (2005) use data on California and find that although schools' racial compositions and proportions of low-income students predict teacher turnover, salaries and working conditions—including large class sizes, facilities problems, multi-track schools, and lack of textbooks—are strong and significant factors in predicting high rates of turnover.

The Schools and Staffing Surveys (SASS) and related Teacher Follow-Up Surveys (TFS) from the National Center for Education Statistics also provide opportunities to model actual teacher turnover using measures of school context that are richer than those typically found in state administrative databases. Using this data, Ingersoll (2001) finds that teacher attrition is higher in schools with low salaries, poor support from school administration, student discipline problems, and limited faculty input into school decisionmaking, even after controlling for student composition, school level, and school location. Grissom (2008) analyzes more recent SASS and TFS data and finds evidence that principal leadership, an orderly schooling environment, greater classroom autonomy, and increased professional development predict lower teacher turnover after controlling for student and teacher demographics. The advantage of the SASS/TFS data is that they are

nationally representative. The disadvantage is the potential for common-source bias that arises from the use of survey data gathered from the same teachers that are observed staying or leaving their schools a year later.

This study extends prior research by using data on all schools and teachers in the New York City public school district to uncover the relationship between school working conditions and teacher attrition. A survey of first-year teachers in spring 2005, a follow-up survey of those same teachers a year later, and matched district administrative data allow us to link teachers' assessments of working conditions to their own career trajectories as well as the retention behavior of all other teachers in their schools. Less-satisfied teachers may report worse working conditions, even if other teachers in the same context would not assess the conditions as poor. We are able to account for this potential bias by examining the career paths of other teachers in the same school, instead of just the career decisions of the teachers reporting on the working conditions. In addition, we are able to triangulate these findings with surveys of teachers who recently left teaching in New York City, asking them what factors were important in their decision to leave. In these analyses, we address the following research questions:

1. *What are first-year teachers' perceptions of school contextual factors?*
2. *What is the relationship between school contextual factors and teacher attrition?*
    a. *How are first-year teachers' assessments of school contextual factors related to their own retention decisions after accounting for other measured school and teacher characteristics?*
    b. *How do first-year teachers' assessments of school contextual factors predict the turnover decisions of other teachers in the same school?*
3. *What aspects of the school context do former teachers report as the most influential in their decisions to leave teaching?*

DATA AND METHODS

Survey of First-Year Teachers

In spring 2005, we administered a survey to all first-year teachers in New York City (Teacher Policy Research 2005). The survey was completed by 4,360 teachers (just over 70% response rate) and consisted of over 300 questions divided into four areas: preparation experiences, characteristics of the schools in which they are teaching, teaching practices, and goals. Participation in the survey was voluntary and took approximately 25 minutes to complete. Participants received $25 after completing the survey.

We use these survey responses to create six school contextual factors: teacher influence, administration, staff relations, students, facilities, and safety. Table 1 provides descriptive statistics for the individual survey items and the Cronbach's alpha for the factors. Each item, except those measuring safety, comes from teachers' responses on a five-point scale. The teacher influence factor has an alpha of 0.78 and comprises six elements. On average, teachers responded that they had the most influence in determining the amount of homework assigned and the least in selecting textbooks and other instructional materials. The administration factor has an alpha of 0.89 and includes seven elements, with administrators being rated highest on evaluating teachers' performances fairly and lowest on consulting staff before making decisions that affect them. The staff relations factor has an alpha of 0.77 and comprises five survey items. The respondents are generally positive about all aspects of their relationships with other staff members, being the most positive about getting good advice from other teachers in their school when they have a teaching problem. The students factor also comprises five elements and has an alpha of 0.68. Of these, the teachers on average are most likely to feel that they get to know personally many students who are not in their class and the least likely to feel that their students receive a lot of support for learning outside school. The facilities factor, including six survey items, has an alpha of 0.72. On average, the teachers are the most positive about having textbooks in their classrooms that are up to date and in good physical condition and the least positive about their school having quiet spaces for teachers to

work when they are not teaching. Since the safety factor includes only two dichotomous survey items, a factor score was not calculated. Instead, the safety variable represents the sum of the items. Thirty percent of the first-year teachers surveyed report that a student from their school has threatened to injure them, and 16 percent state that a student has physically attacked them.

Follow-Up Surveys

In spring 2006, we administered two follow-up surveys to the sample of teachers who were in their first year of teaching in 2004-05. The first was a survey for those teachers who completed the first-year survey who remained in teaching for a second year (Teacher Policy Research 2007a). In this follow-up survey, teachers were asked about their teaching experience, their views concerning those experiences, and their future plans. In this study, we focus on items from the survey that asked teachers who had at some point considered leaving their first New York City teaching position about the factors that caused them to consider leaving and their dissatisfaction with different aspects of teaching such as teaching assignments and school facilities. The survey had a 72 percent response rate. We also administered a survey to the teachers who left teaching in New York City after their first year (Teacher Policy Research 2007b). Respondents were asked about their reasons for leaving teaching. The response rate on this survey was 61 percent. We describe responses on these surveys to two sets of questions, one asking teachers about the factors influencing their decisions to leave and another asking them the degree to which their dissatisfaction with different aspects of teaching influenced their retention decisions.

Administrative Data on Teachers and Schools

We matched survey responses to administrative data provided by the New York City Department of Education (NYCDOE) and the New York State Department of Education (NYSED) using unique teacher identification numbers. The administrative data include information on the teachers and the student demographics at their schools. The data on teachers include 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 (NYCTF), Teach for America (TFA), and other. NYCTF and TFA are early-entry or alternative routes into teaching. 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 temporarily. 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, 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."[1] There are five subareas 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 that is judged on focus and unity, appropriateness, reason and organization, support and development, and structure and conventions (Pearson Education 2006). We use scores on the LAST exam and whether teachers passed the multiple-choice and written component on their first attempt in the analyses.

Table 2 provides descriptive statistics for the analysis variables for schools and for first-year teachers (descriptive statistics on all New York City teachers are available upon request). More than 75 percent of first-year teachers are female, 12 percent are black, 10 percent are Hispanic, and 70 percent are white. Their average age is 30, and 91 percent passed their general knowledge certification exam on their first attempt. Approximately 40 percent entered through a traditional education program while another approximately 40 percent entered teaching through one of the two large early-entry programs, NYCTF and TFA. On average, just over 70 percent of students in the

[1] New York State Education Department, "New York State Detailed Certification Requirement Description," http://eservices.nysed.gov/teach/certhelp/ReqDescription.do?metaValueId=281&catGrpId=null&crcId=19&WIN_TYPE=null.

schools where these first-year teachers work are eligible for subsidized lunches, 36 percent are black, and 41 percent are Hispanic.

Using data on job assignments, we are able to create measures of teacher attrition, our dependent variable in the analyses below. As table 2 shows, 80 percent of first-year teachers who responded to our survey remained in the same school the following year, while 10 percent changed schools within New York City and 9 percent left teaching in New York City. Among the full sample of New York City teachers (not shown in the table), 82 percent stayed in the same school, 8 percent switched schools, and 10 percent left the district.

Methods

We use multinomial logistic regression to estimate the relationship between teacher and school characteristics and teacher retention decisions. 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 schools. The models control for teacher background characteristics including initial pathway into teaching, gender, ethnicity, age, whether they passed the LAST exam on their first attempt, and their score on the LAST exam. The models also include controls for school characteristics that might affect teacher retention—the proportion of students eligible for subsidized lunch, student ethnicity, grade level, and enrollment. After controlling for these teacher and school characteristics, we explore whether the school contextual factors are predictive of teacher retention decisions.

Our variables of interest are the six school contextual factors (teacher influence, administration, staff relations, students, facilities, and safety) derived from the survey of first-year teachers. We look at the contribution of each factor separately and then include all six factors in the models. In the first analyses, we model the relationship between first-year teachers' assessments of these school factors and their own retention a year later. We then use first-year teacher survey responses aggregated by school to model the retention of all teachers in New York City who did not fill out the survey. In other words, we use the evaluations of school working conditions by one set of

teachers (first-year teachers) to predict the retention of other teachers at that school. As discussed above, in this way we remove the part of reporting error by first-year teachers that reflects individual satisfaction with teaching. Finally, we run a further check on the relationship between school context and teacher attrition by examining teacher responses on the follow-up surveys. Using basic descriptive statistics, we assess teachers' responses to questions addressing why they left or why they considered leaving the school where they were teaching in the spring of their first year of teaching in New York City.

RESULTS

Teachers' Assessments of School Contextual Factors

As described above and in table 1, we use first-year teachers' survey responses to create six measures of school contextual factors: teacher influence, administration, staff relations, students, facilities, and safety. Each factor has a mean of 0 and a standard deviation of 1 and is the product of a principal components factor analysis that analyzes the total variance for each factor and not the common variance. Table 3 reports the correlations among the factors aggregated to the school level. Not surprisingly, schools with more positive working conditions on one dimension also tend to have more positive working conditions on the other dimensions. The administration factor is particularly highly correlated with both the students and facilities factors.

Table 4 gives the correlation between these measures and school characteristics. Each school characteristic is measured as a percentile within the distribution of all schools in the city that serve the same or similar grade range (elementary, middle, or high school). Almost across the board, schools with a lower proportion of students eligible for subsidized lunch demonstrate strong teacher-reported working conditions. High schools are an exception to this pattern, but the percentage of students eligible for subsidized lunch is a very inaccurate proxy for poverty in high schools. Generally, a similar pattern holds for schools as measured by the share of black students and Hispanic students; the greater the percentage of black or Hispanic students at a school, the lower the average ratings of working conditions across the six factors. There are a few exceptions

where the relationship between student ethnicity and perceived working conditions are not significant, such as the proportion of black students and teacher influence in middle schools, but the prevalence of common trends is striking. Relationships between school context factors and enrollment are less significant. Not surprisingly, larger elementary, middle, and high schools tend to have less teacher influence. Elementary schools with more students tend to have poorer facilities, according to the first-year teachers surveyed. Surprisingly, larger elementary schools appear to have more positive safety ratings. Except for teacher influence, the school context measures do not have a strong relationship with school size at the middle and high school levels.

School Contextual Factors and Teacher Retention

We use multinomial logistic regression to examine the relationship between the six school contextual factors and teacher retention decisions. Table 5 presents the results for first-year teachers with and without school contextual factors but including teacher characteristics and student demographics. Table 6 includes the estimates with each factor entered separately and a full model with all factors entered together. We present both results because of the relatively high correlation among the measures of school context. Both tables report the results as relative risk ratios, the odds of transferring or quitting relative to the odds of remaining in the same school.

The base model with only teacher characteristics and student demographics shows that, consistent with prior research, teachers are more likely to leave schools with a higher proportion of black and Hispanic students, both to transfer and to leave the district. New York City Teaching Fellows are more likely to transfer across schools than teachers from other routes, and teachers who passed the teacher certification exam on their first attempt are far more likely to leave teaching in New York City. Older teachers are also more likely to transfer to other schools and to leave teaching. The second set of columns in table 5 show that once we control for school context factors (presented in table 6), the coefficients on the proportion of black students and on the proportion of Hispanic students drop meaningfully. In addition, the point estimates are no longer statistically distinguishable from 1 (no effect) for the Hispanic-student concentration and are only distinguishable

from 1 for the black-student concentration for leaving New York City schools, not for transferring across schools.

Table 6 presents the results for specifications in which the six school context factors are added to the model, first separately and then simultaneously. All the variables in table 5 are included in the models reported in table 6, but the relative risk ratios associated with these variables are omitted for brevity. When we add each school contextual factor separately to this model, we find that all factors except safety significantly predict teachers' retention decisions. More specifically, in these estimates, the effect of the *respondents'* perceptions of teachers' influence is related the *respondents'* decisions to transfer but not to leave teaching in New York City; while their perceptions of administration, staff relations, students, and facilities are related to both their decisions to transfer and their decisions to leave teaching.

In the full model, including all six school contextual factors and the controls, the administration factor is the only one that significantly predicts teacher retention decisions after controlling for other school and teacher characteristics. Teachers who have less positive perceptions of their school administrators are more likely to transfer to another school and to leave teaching in New York City. A standard deviation increase in a teacher's assessment of the administration decreases his or her likelihood of transferring by approximately 44 percent relative to staying in the same school, and it decreases his or her likelihood of leaving teaching in New York City by approximately 28 percent relative to staying in the same school. If we use the coefficients in this model to predict the probability of a teacher transferring under different working condition, we estimate that if all the working conditions measures were average, a white female teacher from a college-recommended route in a school with average student composition would have a 7.6 percent probability of leaving and a 10.0 percent probability of transferring. If the working conditions measures were one standard deviation above average, these probabilities would drop to 4.1 percent and 6.7 percent; whereas if the working conditions measures were one standard deviation below average, these probabilities would increase to 13.5 percent and 14.8 percent. Working conditions, and especially administrative support, account for large differences in attrition rates.

To separate the effects of these school contextual factors from teacher characteristics, we also predict the retention of all other teachers at the school using the perceptions of the first-year teachers. More specifically, we use a school-level average for each factor based on the first-year teachers' survey responses to predict teacher retention decision for all teachers at the school excluding the first-year teacher respondents. As shown in table 7, similar to our previous analyses, when each school contextual factor is included separately, administration, staff relations, students, and facilities factors significantly predict decisions to transfer and to leave teaching in New York City. The more positive first-year teachers' assessments of these factors, the more likely other teachers at the school are to stay. Unlike the results for first-year teachers, perceptions of teacher influence significantly relate to decisions to leave teaching but not to transfer within New York City, and perceptions of safety relate to transferring but not leaving. In the model including all school context factors and controls, teacher influence is somewhat surprisingly positively associated with teachers' decision to transfer across schools. However, here again, administration emerges as the strongest predictor of retention relative to both transferring and leaving.

Teachers' Stated Reasons for Leaving or Considering Leaving

The longitudinal analyses presented above demonstrates that a teacher's reporting of working conditions predicts his or her own attrition in the following year as well as the attrition of other teachers in the school. The support of administrators emerges as a particularly important factor in retention decisions. While this type of longitudinal analysis reduces potential biases resulting from self-reports of working conditions linked to concurrent self-reports of satisfaction or plans for the future—data that many previous studies have used (see, for example, Ingersoll 2001 and Johnson and Birkeland 2003)—it is worth comparing these results to teachers' direct answers when asked why they left or why they considered leaving.

In surveys during fall 2005, we asked former teachers (who had left teaching after their first year, 2004-05) why they left, and we asked current teachers (now in their second year of teaching) who indicated that they had considered leaving their school about factors that led them to consider

leaving. Each group of teachers was asked four questions. The first asked them to indicate how important each of 12 factors was in their decision to leave their 2004-05 New York City teaching position using a five-point scale ranging from not important to extremely important. (These factors are listed in figure 1.) The second asked them to choose the one factor from this list that was their most important consideration. The third question asked them to indicate how important their dissatisfaction with each of 12 aspects of their job was in their decision to leave the New York City school where they taught in 2004-05. (These aspects are listed in figure 2.) Again, they were asked to rate each using a five-point scale ranging from not important to extremely important, and a follow-up question asked them to choose the one aspect they considered the most important in their decision to leave.

Dissatisfaction with job is the main factor that teachers cite for leaving or considering leaving. Figure 1 shows that for both current and former teachers, dissatisfaction with their jobs is by far the most important factor, with over 35 percent of both groups citing it as the most important reason for leaving or considering leaving. A fair number of former teachers also report the most important factor in their leaving was because they moved (living in a different place), because of other family or personal reasons, and because of other attractive job opportunities. These factors were not as important for teachers who were still teaching but had considered leaving. The next questions provides further insights into this job dissatisfaction factor, unpacking which aspects of first-year teachers' jobs were particularly dissatisfying and influential in their decisions to leave.

Each set of teachers was asked what aspect of their job most influenced their decision to leave or to consider leaving. As presented in figure 2, the dominance of dissatisfaction with administrative support is striking. Hardly any teachers cited dissatisfaction with colleagues, autonomy over the classroom, school facilities, respect from students and/or parents, ability to help students, emphasis on student testing, school safety, teaching assignment, teaching philosophy, or district policies as the primary reason for leaving or considering leaving. While over 15 percent of both groups reported dissatisfaction with student behavior as the most important factor influencing

their decision to leave their school, well over 40 percent of both groups identified dissatisfaction with the administration as the most important factor.

Other questions in the survey of former teachers also shed light on the importance of administrative support. In one question (not presented in the figures), former teachers on average indicated that they currently receive much more recognition and support from their administrators or managers than they had as teachers. Another set of questions asked the former teachers about the behaviors of their former principal. Less than 10 percent found their principal exceptional in communicating respect or appreciation for teachers, encouraging teachers to change teaching methods if students were not doing well, working with teaching staff to solve school or departmental problems, encouraging staff to use student assessment results in planning curriculum and instruction, or working to develop broad agreement among teaching staff about the school's mission. Additionally, almost 20 percent of former teachers reported that their principals never worked with staff to meet curriculum standards, and 30 percent stated that their principals did not encourage professional collaboration among teachers. Administration emerged as the main factor in teacher attrition in these surveys, just as it did in the analysis of actual attrition behavior above.

DISCUSSION

Teacher attrition may not be substantially higher than attrition from other professions (Henke, Zahn, and Carroll 2001). However, attrition at some schools is very high, high enough to disrupt instructional cohesion and likely disadvantage students. Prior research has shown clearly that these high-turnover schools are likely to serve large populations of low-performing, nonwhite, and low-income students, just the students most in need of a consistent and supportive school experience (Boyd et al. 2005; Carroll et al. 2000; Hanushek et al. 2004; Scafidi et al. 2005). While this previous research has identified the problem, it has done less to clarify why there is higher turnover at these schools and to identify fruitful avenues for reform.

There are indications that working conditions, aside from those directly resulting from student composition, affect teachers' career decisions. A relatively large literature has used cross-sectional

data to link teachers' self-reports of school working conditions to measures of their own satisfaction and plans for the future. This approach has the potential bias that less-satisfied teachers will misrepresent school working conditions and the correlations between working conditions and satisfaction will reflect only reporting bias and not true working conditions. Studies using the Schools and Staffing Surveys have estimated the relationship between self-reported working conditions and attrition (Grissom 2008; Ingersoll 2001) but even there, lack of controls for district differences and inaccurate self-reporting may bias the findings.

This study uses first-year teachers' reports of working conditions to assess the effect of working conditions on the turnover behavior of other teachers in the school. Since the reporting teachers and the teachers for whom we model turnover are not the same, we reduce the problem of self-reporting bias that is correlated with career decisions. We also triangulate our findings with teachers' own reports of why they left or considered leaving in a follow-up survey. While we address multiple measures of school context—including teachers' influence over school policy, the effectiveness of the school administration, staff relations, student behavior, facilities, and safety—the results of both analyses point to the importance of working conditions and particularly of administrative support in teacher retention.

In many ways, this is good news from a policy perspective for it is difficult to change the student demographics of a school, as evidenced by school desegregation policies. In contrast, school contextual factors such as administrative support are more policy-amenable. This study suggests that policies aimed at improving school administration may be effective at reducing teacher turnover. It is important to remember, however, that school administrators are subject to many of the same labor market dynamics as teachers. Horng, Kalogrides, and Loeb (2009) find, for example, that principals express preferences for schools with higher-performing students and lower concentrations of students in poverty and that principals, like teachers, move toward these more desirable schools when given the opportunity. Improving administrative support in high-turnover schools may require both more effective leaders, overall, and incentives (not necessarily monetary) so administrative positions in these schools become more appealing.

This study is clearly just a step in understanding the role of school context in teacher career decisions. It is imperfect in many ways. In particular, while we provide evidence that the school administration is an important factor in teacher retention decisions, our data do not provide enough richness about the role of administration to determine how or why administrative support affects teachers, nor do our data allow us to identify clear policy levers for reform. For example, one survey item asked teachers to rate the statement: “The school administration’s behavior toward the staff is supportive and encouraging.” Perhaps teachers consider “supportive and encouraging” administrators ones who promptly respond to teachers’ requests for classroom supplies, or maybe it’s ones who effectively handle student discipline issues. Additionally, what teachers consider “supportive and encouraging” may vary; for one teacher it may be being generally left alone and trusted with autonomy, while for another it may be administrators who frequently visit the classroom and provide feedback on instruction. Follow-up studies are necessary to investigate why administrative support is important to teachers and what particularly the administration does or does not do that influences a teacher to stay or leave. There is also a need to investigate other school contextual factors not included in this study that are likely to be important to teachers, such as teachers’ opportunities for collaboration, staff development, teacher autonomy, and school neighborhood characteristics.

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APPENDIX OF TABLES

Table 1
Descriptive Statistics from the First-Year Teacher Survey

	N	*Mean*	*SD*
Teacher Influence[a] *[α*[b] *= 0.784 (0.775)]*			
Selecting textbooks and other instructional materials	4,264	2.642	1.320
Selecting content, topics, and skills to be taught	4,266	2.887	1.266
Selecting teaching techniques	4,259	3.269	1.235
Evaluating and grading students	4,260	3.856	1.019
Disciplining students	4,261	3.598	1.113
Determining the amount of homework to be assigned	4,258	4.034	1.013
Administration[c] *[α = 0.887 (0.882)]*			
The school administration's behavior toward the staff is supportive and encouraging	4,271	3.348	1.296
The school administration usually consults with staff members before making decisions that affect us	4,262	2.621	1.228
The school administration has a well-planned and enforced school discipline policy	4,264	2.631	1.315
The school administration deals effectively with pressures from outside the school (for example, from the district or from parents) that might interfere with my teaching	4,258	3.062	1.186
The school administration does a good job of getting resources for this school	4,251	3.429	1.188
The school administration evaluates teachers' performance fairly	4,252	3.522	1.085
Data on student learning are regularly collected and reviewed with all members of the school community (teachers, administrators, etc.)	4,253	2.890	1.172
Staff Relations[c] *[α = 0.769 (0.759)]*			
There is a great deal of cooperative effort among the staff members	4,279	3.627	1.110
Most of my colleagues share my beliefs and values about what the central mission of the school should be	4,274	3.581	1.000
I make a conscious effort to coordinate the content of my classes with that of other teachers	4,269	3.567	1.028
I can get good advice from other teachers in this school when I have a teaching problem	4,274	4.076	0.872
In this school, I am encouraged to experiment with my teaching	4,269	3.174	1.224
Students[c] *[α = 0.683 (0.670)]*			
The level of student misbehavior in this school (such as noise, horseplay or fighting in the halls, cafeteria) interferes with instructional activities	4,280	3.755	1.280
The attitudes and habits students bring to my class greatly reduce their chances for academic success	4,272	3.770	1.191
Rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes	4,270	3.091	1.217
I get to know personally many students who are not in my classes	4,271	3.290	1.130
My students receive a lot of support for learning outside of school	4,261	2.423	1.128
Facilities[c] *[α = 0.715 (0.703)]*			
Necessary materials such as textbooks, supplies, and copy machines are available as needed by staff	4,276	3.024	1.313
My classroom is often uncomfortably warm or cold	4,275	3.093	1.256
I regularly see evidence of cockroaches, rats, or mice in this school	4,276	2.941	1.358
The textbooks that I use in class are up to date and in good physical condition	4,238	3.389	1.172
My school has quiet spaces for teachers to work when they are not teaching	4,272	2.916	1.307
The facilities at my school are conducive to effective teaching and learning	4,271	3.215	1.120
Safety[d]			
Has a student from this school threatened to injure you	4,198	0.299	
Has a student from this school physically attacked you	4,198	0.159	

[a] Responses were 1 (no influence), 2 (minimal influence), 3 (moderate influence), 4 (significant influence), 5 (a great deal of influence).

[b] One-sided confidence interval in parentheses which indicates that there is a 95% chance that the Cronbach's alpha will be higher than this value (Bleda and Tobias 2000).
[c] Responses were 1 (strongly disagree), 2 (disagree), 3 (neither agree or disagree), 4 (agree), 5 (strongly agree).
[d] There were only two safety items, so a factor score was not calculated. Instead, the variable created for the safety variables is the sum of the dichotomous items.

Table 2

Descriptive Statistics for First-Year Teachers and Schools

	N	*M*	*SD*
Teachers			
Age	3,810	29.517	8.163
Female	3,811	0.757	0.429
African American	3,709	0.121	0.326
Hispanic	3,709	0.099	0.299
White	3,709	0.698	0.459
Other nonwhite race or ethnicity	3,709	0.082	0.274
LAST passed on first attempt	3,735	0.912	0.283
LAST score	3,752	258.830	26.077
Pathway: college recommended	3,769	0.412	0.492
Pathway: New York City Teaching Fellows	3,769	0.357	0.479
Pathway: Teach for America	3,769	0.061	0.240
Pathway: temporary license	3,769	0.009	0.095
Pathway: individual evaluation	3,769	0.067	0.250
Pathway: other	3,769	0.093	0.291
Retention: same school within New York City	3,044	0.806	
Retention: different school within New York City	392	0.104	
Retention: left New York City	341	0.090	
Schools			
Students qualify for free lunch program	1,037	70.357	21.773
African American students	1,032	36.069	27.911
Hispanic students	1,032	41.414	25.235
Enrollment	1,032	799.521	633.834
Elementary school	993	0.571	
Middle school	993	0.188	
High school	993	0.241	
School context measures			
Teacher influence	1,101	0.969	0.782
Administration	1,094	0.099	0.081
Staff relations	1,097	0.060	0.728
Students	1,095	0.094	0.857
Facilities	1,097	0.085	0.770
Safety	1,093	2.534	0.558

Table 3

Correlations between School Context Measures (*n* = 1,350)

	1	*2*	*3*	*4*	*5*	*6*
1. Teacher influence	---					
2. Administration	0.365	---				
3. Staff relations	0.237	0.525	---			
4. Students	0.315	0.612	0.429	---		
5. Facilities	0.144	0.651	0.447	0.549	---	
6. Safety	0.144	0.353	0.202	0.423	0.314	---

Note. All correlations are significant at $p < .001$.

Table 4

Correlations between School Context Measures and School Characteristics by School Level

	Free lunch	*Black*	*Hispanic*	*Enrollment*
Elementary (*n* = 747)				
Teacher influence	-0.194***	-0.126**	-0.010	-0.109**
Administration	-0.326***	-0.284***	-0.161***	-0.054
Staff relations	-0.277***	-0.119**	-0.181***	-0.056
Students	-0.462***	-0.454***	-0.163***	-0.016
Facilities	-0.339***	-0.238***	-0.143***	-0.092*
Safety	-0.239***	-0.260***	-0.084*	0.106*
Middle (*n* = 225)				
Teacher influence	-0.213**	-0.034	-0.084	-0.204*
Administration	-0.258***	-0.189**	-0.164*	0.086
Staff relations	-0.289***	-0.143*	-0.108	0.027
Students	-0.393***	-0.247***	-0.166*	0.072
Facilities	-0.359***	-0.211**	-0.246***	0.029
Safety	-0.299***	-0.248***	-0.042	0.085
High (*n* = 322)				
Teacher influence	0.023	-0.110	0.082	-0.265***
Administration	-0.071	-0.135	-0.044	-0.019
Staff relations	-0.216***	-0.041	-0.188	-0.019
Students	-0.293***	-0.322***	-0.234***	0.053
Facilities	-0.088	-0.052	-0.193**	-0.116
Safety	-0.128*	-0.298***	0.052	0.041

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 5
Multinomial Logistic Regression Models for First-Year Teachers

	Without School Contextual Variables		*With School Contextual Variables*	
	Transferred	*Left*	*Transferred*	*Left*
School: free lunch	0.993	0.998	0.992	0.997
	(0.005)	(0.004)	(0.005)	(0.004)
School: African American	1.010*	1.015**	1.004	1.009*
	(0.004)	(0.004)	(0.005)	(0.004)
School: Hispanic	1.011*	1.012*	1.005	1.006
	(0.005)	(0.005)	(0.006)	(0.005)
School: total enrollment	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)
School: middle	2.202**	1.804**	2.088**	1.658**
	(0.382)	(0.293)	(0.372)	(0.294)
School: high	0.985	0.998	1.069	0.982
	(0.185)	(0.184)	(0.219)	(0.198)
Pathway: independent	1.215	1.017	1.175	0.991
	(0.294)	(0.270)	(0.290)	(0.264)
Pathway: Teaching Fellows	1.600**	0.723	1.524**	0.691*
	(0.248)	(0.127)	(0.242)	(0.122)
Pathway: Teach for America	1.033	0.464*	0.940	0.401**
	(0.300)	(0.157)	(0.272)	(0.137)
Pathway: temporary license	1.827	0.572	1.878	0.612
	(1.056)	(0.602)	(1.090)	(0.642)
Pathway: other	1.265	1.341	1.229	1.295
	(0.269)	(0.291)	(0.265)	(0.287)
Teacher: female	0.892	0.953	0.876	0.948
	(0.121)	(0.138)	(0.120)	(0.140)
Teacher: African American	0.827	0.720	0.810	0.707
	(0.156)	(0.157)	(0.158)	(0.155)
Teacher: Hispanic	0.691+	0.999	0.679	0.987
	(0.152)	(0.231)	(0.152)	(0.229)
Teacher: other ethnicity	0.966	0.740	0.982	0.737
	(0.208)	(0.199)	(0.216)	(0.201)
Teacher: Age	1.022**	1.020*	1.023**	1.020*
	(0.007)	(0.008)	(0.007)	(0.008)
Teacher: Passed LAST 1st try	1.379	2.246*	1.449	2.351*
	(0.405)	(0.827)	(0.432)	(0.880)
Teacher: LAST exam score	0.994	1.004	0.993*	1.002
	(0.003)	(0.004)	(0.004)	(0.004)
Number of observations	3,298		3,298	
Chi^2	147.999		226.264	
Pseudo R^2	0.037		0.054	

Note. Relative risk ratios (standard errors in parentheses) where comparison group is "stay in same school."
* $p < 0.05$, ** $p < 0.01$

Table 6

Summary of Multinomial Logistic Regression Models for First-Year Teachers

	Model with School Factors Entered Separately		*Full Model*	
	Transferred	*Left New York City*	*Transferred*	*Left New York City*
Teacher influence	0.792**	0.961	1.085	1.249**
	(0.078)	(0.100)	(0.117)	(0.141)
Administration	0.541***	0.652***	0.552***	0.692**
	(0.060)	(0.059)	(0.083)	(0.096)
Staff relations	0.653***	0.717**	0.874	0.884
	(0.065)	(0.078)	(0.108)	(0.119)
Students	0.677***	0.739**	1.103	1.041
	(0.084)	(0.090)	(0.168)	(0.169)
Facilities	0.640***	0.671***	0.956	0.840
	(0.070)	(0.072)	(0.125)	(0.123)
Safety	0.710	0.782	0.925	0.940
	(0.098)	(0.115)	(0.144)	(0.157)

Notes: Relative risk ratios (standard errors in parentheses) where comparison group is "stay in same school." These models include controls for student demographics, school grade level, school enrollment, teacher demographics, and teacher preparation experiences. Relative risk ratios for control variables are not shown here for brevity.

*p < .01 **p < .05 ***p < .001

Table 7

Summary of Multinomial Logistic Regression Models for All Teachers Excluding Survey Respondents

	Model with School Factors Entered Separately		*Full Model*	
	Transferred	*Left New York City*	*Transferred*	*Left New York City*
Teacher influence	1.018	0.905*	1.201**	0.987
	(0.060)	(0.037)	(0.076)	(0.044)
Administration	0.719***	0.822***	0.679***	0.859*
	(0.041)	(0.031)	(0.053)	(0.051)
Staff relations	0.790**	0.888**	0.878	0.986
	(0.052)	(0.036)	(0.064)	(0.049)
Students	0.829**	0.872**	1.054	0.990
	(0.051)	(0.040)	(0.078)	(0.060)
Facilities	0.857**	0.860***	1.094	0.964
	(0.049)	(0.037)	(0.087)	(0.054)
Safety	0.837*	0.889	0.916	0.969
	(0.071)	(0.049)	(0.082)	(0.058)

Note. Relative risk ratios (standard errors in parentheses) where comparison group is "stay in same school. These models include controls for student demographics, school grade level, school enrollment, teacher demographics, and teacher preparation experiences. Relative risk ratios for control variables are not shown here for brevity.

*p < .01 **p < .05 ***p < .001

Figure 1. **Most Important Factor in Decisions to Leave Teaching for Former (*n* = 386) and Current Teachers (*n* = 1,587)**

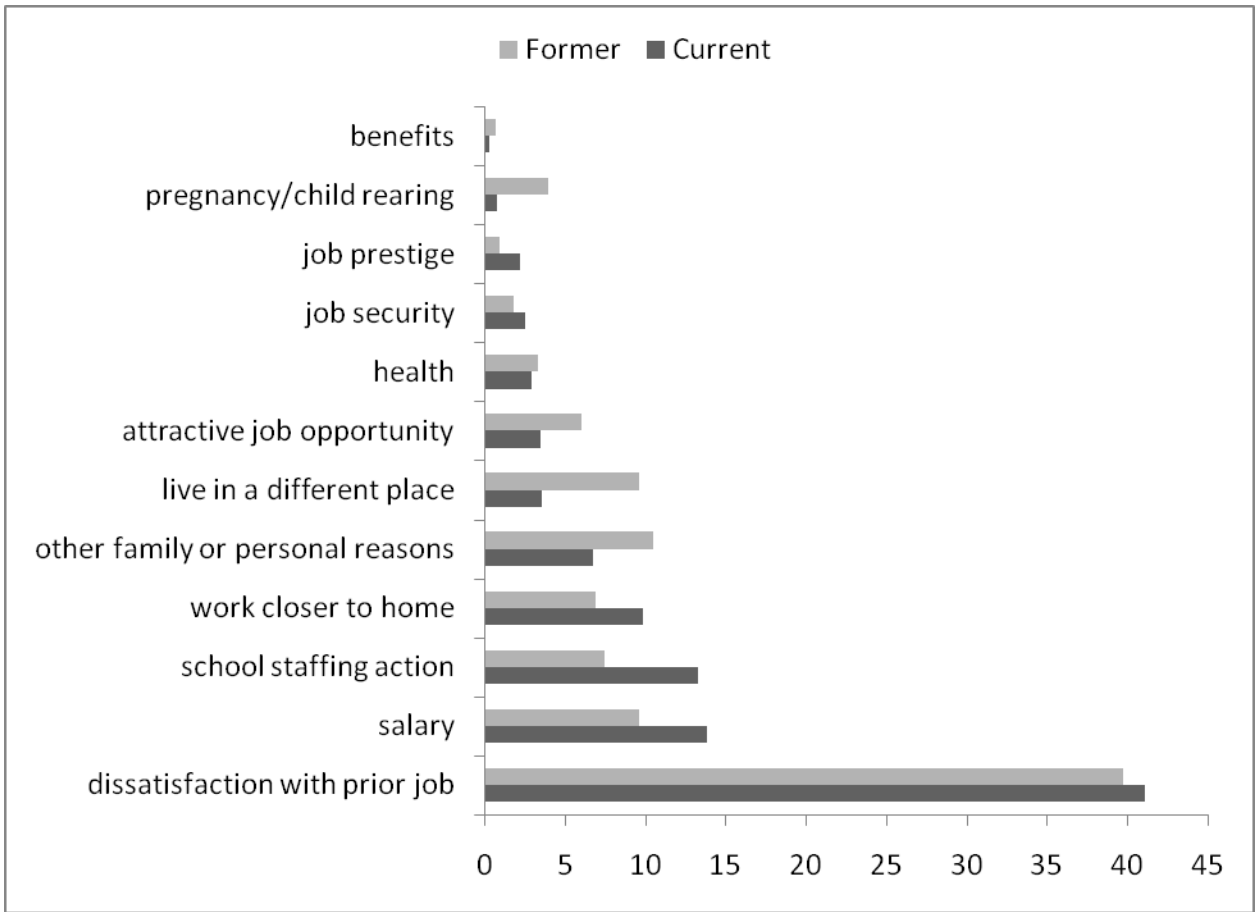
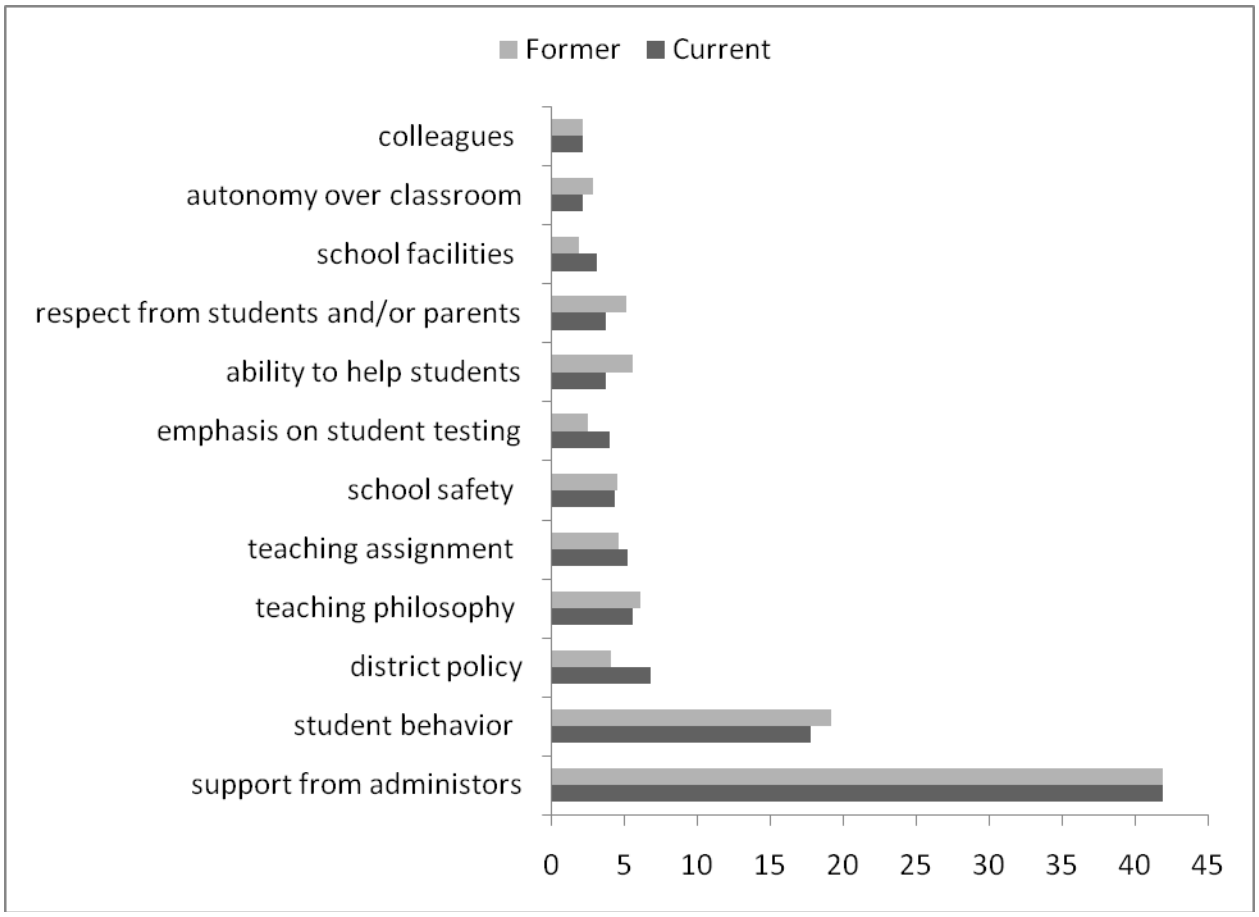


Figure 2. **Most Important Aspect of Job Influencing Decisions to Leave Teaching for Former (*n* = 386) and Current Teachers (*n* = 1,587)**



INTRODUCTION

When given the opportunity, many teachers choose to leave schools serving poor, low-performing, and nonwhite students (Boyd et al. 2005; Hanushek, Kain, and Rivkin 2004; Scafidi, Sjoquist, and Stinebrickner 2005). While a substantial research literature has documented this phenomenon, far less research effort has gone into understanding what features of the working conditions in these schools drive this relatively higher turnover rate (see Loeb, Darling-Hammond, and Luczak 2005 for an exception to this). Excessive teacher turnover can be costly and detrimental to instructional cohesion in schools (National Commission on Teaching and America's Future 2003). Consequently, many policies, such as mentoring programs and retention bonuses, have aimed to stem teacher attrition, particularly at schools that experience high teacher turnover. Yet, without a better understanding of the reasons teachers leave, these approaches may not be as effective as they could be.

This study contributes to our understanding of teacher attrition by modeling the relationship between teacher turnover and school contextual factors, including teachers' influence over school policy, the effectiveness of the school administration, staff relations, student behavior, safety, and facilities. Using a unique dataset that combines longitudinal survey data with district administrative files, we find that school administration plays a particularly important role in teachers' career decisions. In what follows, we briefly review relevant prior research to motivate our study, describe our data and methods, and then present the results. The final section discusses the implications of these results, limitations of the study, and directions for future research.

BACKGROUND AND MOTIVATION

Across the United States, approximately half a million teachers leave their schools each year. Only 16 percent of this teacher attrition at the school level can be attributed to retirement. The remaining 84 percent of teacher turnover results from teachers transferring between schools and teachers leaving the profession entirely (Alliance for Excellent Education 2008). In New York City alone, over

5,000 teachers left their schools in 2005, with 8 percent of teachers transferring to another school and 10 percent leaving the New York City school system. Recent literature has begun to investigate the complexities of teacher turnover, making important distinctions such as among exits from teaching, transfers within districts, and transfers between districts as well as between teachers leaving permanently and those leaving and later returning (DeAngelis and Presley 2007; Johnson, Berg, and Donaldson 2005). In general, previous teacher retention research has focused either on the relationship between turnover and teachers' characteristics (i.e., what types of teachers are more likely to leave) or between turnover and school characteristics (i.e., what types of schools experience higher teacher turnover).

Teacher background characteristics and work experience consistently predict turnover. For example, turnover is higher among young and old teachers versus middle-aged ones (Guarino, Santibanez, and Daley 2006; Johnson et al. 2005); and among less experienced teachers versus more experienced ones (Ingersoll 2001; Marvel et al. 2006). The research linking teacher gender, race, or ethnicity to turnover is less consistent (Guarino et al. 2006; Johnson et al. 2005). Teachers' preparation experiences and pathways into teaching are also related to attrition behavior. On average, teachers from early-entry routes (such as Teach for America and the New York City Teaching Fellows) are more likely to leave than teachers from more traditional routes (Boyd et al. 2006). Finally, teacher quality measures have been linked with attrition behavior but somewhat inconsistently. Teachers with stronger qualifications, as measured by their test scores and the competitiveness of the undergraduate institution from which they received degrees, are more likely to leave teaching (Boyd et al. 2005). However, teachers who are more effective, as measured by the test score gains of the students in their classrooms, are less likely to leave teaching (Boyd et al. 2007; Goldhaber, Gross, and Player 2007; Hanushek et al. 2005).

Research on the relationship between teacher retention and school characteristics has focused primarily on measures of the school's student composition. Schools with large concentrations of low-income, nonwhite, and low-achieving students are the most likely to experience high teacher turnover (Boyd et al. 2005; Carroll, Reichardt, and Guarino 2000; Hanushek

et al. 2004; Scafidi et al. 2005). For example, in New York City, there is a 27 percent attrition rate of first-year teachers in the lowest performing schools compared with a 15 percent rate in the schools with the highest student achievement.

Some studies have examined the relationship between teacher turnover and school or district factors (Buckley, Schneider, and Shang 2005; Hirsh and Emerick 2006). Unlike the studies predicting turnover by student composition that use large, longitudinal datasets, most of these studies must rely upon surveys of teachers asking about their perceptions of working conditions and likelihood of leaving. These survey data likely produce less accurate models of teacher turnover because a teacher's report of working conditions could be affected by whether she or he plans to leave the school.

Some state databases are rich enough to model the relationship between teacher turnover and certain school or district factors. For example, Imazeki (2005) uses data from Wisconsin and finds that teacher retention is higher when salaries are higher. Loeb, Darling-Hammond, and Luczak (2005) use data on California and find that although schools' racial compositions and proportions of low-income students predict teacher turnover, salaries and working conditions—including large class sizes, facilities problems, multi-track schools, and lack of textbooks—are strong and significant factors in predicting high rates of turnover.

The Schools and Staffing Surveys (SASS) and related Teacher Follow-Up Surveys (TFS) from the National Center for Education Statistics also provide opportunities to model actual teacher turnover using measures of school context that are richer than those typically found in state administrative databases. Using this data, Ingersoll (2001) finds that teacher attrition is higher in schools with low salaries, poor support from school administration, student discipline problems, and limited faculty input into school decisionmaking, even after controlling for student composition, school level, and school location. Grissom (2008) analyzes more recent SASS and TFS data and finds evidence that principal leadership, an orderly schooling environment, greater classroom autonomy, and increased professional development predict lower teacher turnover after controlling for student and teacher demographics. The advantage of the SASS/TFS data is that they are

nationally representative. The disadvantage is the potential for common-source bias that arises from the use of survey data gathered from the same teachers that are observed staying or leaving their schools a year later.

This study extends prior research by using data on all schools and teachers in the New York City public school district to uncover the relationship between school working conditions and teacher attrition. A survey of first-year teachers in spring 2005, a follow-up survey of those same teachers a year later, and matched district administrative data allow us to link teachers' assessments of working conditions to their own career trajectories as well as the retention behavior of all other teachers in their schools. Less-satisfied teachers may report worse working conditions, even if other teachers in the same context would not assess the conditions as poor. We are able to account for this potential bias by examining the career paths of other teachers in the same school, instead of just the career decisions of the teachers reporting on the working conditions. In addition, we are able to triangulate these findings with surveys of teachers who recently left teaching in New York City, asking them what factors were important in their decision to leave. In these analyses, we address the following research questions:

1. *What are first-year teachers' perceptions of school contextual factors?*
2. *What is the relationship between school contextual factors and teacher attrition?*
    a. *How are first-year teachers' assessments of school contextual factors related to their own retention decisions after accounting for other measured school and teacher characteristics?*
    b. *How do first-year teachers' assessments of school contextual factors predict the turnover decisions of other teachers in the same school?*
3. *What aspects of the school context do former teachers report as the most influential in their decisions to leave teaching?*

DATA AND METHODS

Survey of First-Year Teachers

In spring 2005, we administered a survey to all first-year teachers in New York City (Teacher Policy Research 2005). The survey was completed by 4,360 teachers (just over 70% response rate) and consisted of over 300 questions divided into four areas: preparation experiences, characteristics of the schools in which they are teaching, teaching practices, and goals. Participation in the survey was voluntary and took approximately 25 minutes to complete. Participants received $25 after completing the survey.

We use these survey responses to create six school contextual factors: teacher influence, administration, staff relations, students, facilities, and safety. Table 1 provides descriptive statistics for the individual survey items and the Cronbach's alpha for the factors. Each item, except those measuring safety, comes from teachers' responses on a five-point scale. The teacher influence factor has an alpha of 0.78 and comprises six elements. On average, teachers responded that they had the most influence in determining the amount of homework assigned and the least in selecting textbooks and other instructional materials. The administration factor has an alpha of 0.89 and includes seven elements, with administrators being rated highest on evaluating teachers' performances fairly and lowest on consulting staff before making decisions that affect them. The staff relations factor has an alpha of 0.77 and comprises five survey items. The respondents are generally positive about all aspects of their relationships with other staff members, being the most positive about getting good advice from other teachers in their school when they have a teaching problem. The students factor also comprises five elements and has an alpha of 0.68. Of these, the teachers on average are most likely to feel that they get to know personally many students who are not in their class and the least likely to feel that their students receive a lot of support for learning outside school. The facilities factor, including six survey items, has an alpha of 0.72. On average, the teachers are the most positive about having textbooks in their classrooms that are up to date and in good physical condition and the least positive about their school having quiet spaces for teachers to

work when they are not teaching. Since the safety factor includes only two dichotomous survey items, a factor score was not calculated. Instead, the safety variable represents the sum of the items. Thirty percent of the first-year teachers surveyed report that a student from their school has threatened to injure them, and 16 percent state that a student has physically attacked them.

Follow-Up Surveys

In spring 2006, we administered two follow-up surveys to the sample of teachers who were in their first year of teaching in 2004-05. The first was a survey for those teachers who completed the first-year survey who remained in teaching for a second year (Teacher Policy Research 2007a). In this follow-up survey, teachers were asked about their teaching experience, their views concerning those experiences, and their future plans. In this study, we focus on items from the survey that asked teachers who had at some point considered leaving their first New York City teaching position about the factors that caused them to consider leaving and their dissatisfaction with different aspects of teaching such as teaching assignments and school facilities. The survey had a 72 percent response rate. We also administered a survey to the teachers who left teaching in New York City after their first year (Teacher Policy Research 2007b). Respondents were asked about their reasons for leaving teaching. The response rate on this survey was 61 percent. We describe responses on these surveys to two sets of questions, one asking teachers about the factors influencing their decisions to leave and another asking them the degree to which their dissatisfaction with different aspects of teaching influenced their retention decisions.

Administrative Data on Teachers and Schools

We matched survey responses to administrative data provided by the New York City Department of Education (NYCDOE) and the New York State Department of Education (NYSED) using unique teacher identification numbers. The administrative data include information on the teachers and the student demographics at their schools. The data on teachers include 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 (NYCTF), Teach for America (TFA), and other. NYCTF and TFA are early-entry or alternative routes into teaching. 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 temporarily. 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, 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."[1] There are five subareas 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 that is judged on focus and unity, appropriateness, reason and organization, support and development, and structure and conventions (Pearson Education 2006). We use scores on the LAST exam and whether teachers passed the multiple-choice and written component on their first attempt in the analyses.

Table 2 provides descriptive statistics for the analysis variables for schools and for first-year teachers (descriptive statistics on all New York City teachers are available upon request). More than 75 percent of first-year teachers are female, 12 percent are black, 10 percent are Hispanic, and 70 percent are white. Their average age is 30, and 91 percent passed their general knowledge certification exam on their first attempt. Approximately 40 percent entered through a traditional education program while another approximately 40 percent entered teaching through one of the two large early-entry programs, NYCTF and TFA. On average, just over 70 percent of students in the

[1] New York State Education Department, "New York State Detailed Certification Requirement Description," http://eservices.nysed.gov/teach/certhelp/ReqDescription.do?metaValueId=281&catGrpId=null&crcId=19&WIN_TYPE=null.

schools where these first-year teachers work are eligible for subsidized lunches, 36 percent are black, and 41 percent are Hispanic.

Using data on job assignments, we are able to create measures of teacher attrition, our dependent variable in the analyses below. As table 2 shows, 80 percent of first-year teachers who responded to our survey remained in the same school the following year, while 10 percent changed schools within New York City and 9 percent left teaching in New York City. Among the full sample of New York City teachers (not shown in the table), 82 percent stayed in the same school, 8 percent switched schools, and 10 percent left the district.

Methods

We use multinomial logistic regression to estimate the relationship between teacher and school characteristics and teacher retention decisions. 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 schools. The models control for teacher background characteristics including initial pathway into teaching, gender, ethnicity, age, whether they passed the LAST exam on their first attempt, and their score on the LAST exam. The models also include controls for school characteristics that might affect teacher retention—the proportion of students eligible for subsidized lunch, student ethnicity, grade level, and enrollment. After controlling for these teacher and school characteristics, we explore whether the school contextual factors are predictive of teacher retention decisions.

Our variables of interest are the six school contextual factors (teacher influence, administration, staff relations, students, facilities, and safety) derived from the survey of first-year teachers. We look at the contribution of each factor separately and then include all six factors in the models. In the first analyses, we model the relationship between first-year teachers' assessments of these school factors and their own retention a year later. We then use first-year teacher survey responses aggregated by school to model the retention of all teachers in New York City who did not fill out the survey. In other words, we use the evaluations of school working conditions by one set of

teachers (first-year teachers) to predict the retention of other teachers at that school. As discussed above, in this way we remove the part of reporting error by first-year teachers that reflects individual satisfaction with teaching. Finally, we run a further check on the relationship between school context and teacher attrition by examining teacher responses on the follow-up surveys. Using basic descriptive statistics, we assess teachers' responses to questions addressing why they left or why they considered leaving the school where they were teaching in the spring of their first year of teaching in New York City.

RESULTS

Teachers' Assessments of School Contextual Factors

As described above and in table 1, we use first-year teachers' survey responses to create six measures of school contextual factors: teacher influence, administration, staff relations, students, facilities, and safety. Each factor has a mean of 0 and a standard deviation of 1 and is the product of a principal components factor analysis that analyzes the total variance for each factor and not the common variance. Table 3 reports the correlations among the factors aggregated to the school level. Not surprisingly, schools with more positive working conditions on one dimension also tend to have more positive working conditions on the other dimensions. The administration factor is particularly highly correlated with both the students and facilities factors.

Table 4 gives the correlation between these measures and school characteristics. Each school characteristic is measured as a percentile within the distribution of all schools in the city that serve the same or similar grade range (elementary, middle, or high school). Almost across the board, schools with a lower proportion of students eligible for subsidized lunch demonstrate strong teacher-reported working conditions. High schools are an exception to this pattern, but the percentage of students eligible for subsidized lunch is a very inaccurate proxy for poverty in high schools. Generally, a similar pattern holds for schools as measured by the share of black students and Hispanic students; the greater the percentage of black or Hispanic students at a school, the lower the average ratings of working conditions across the six factors. There are a few exceptions

where the relationship between student ethnicity and perceived working conditions are not significant, such as the proportion of black students and teacher influence in middle schools, but the prevalence of common trends is striking. Relationships between school context factors and enrollment are less significant. Not surprisingly, larger elementary, middle, and high schools tend to have less teacher influence. Elementary schools with more students tend to have poorer facilities, according to the first-year teachers surveyed. Surprisingly, larger elementary schools appear to have more positive safety ratings. Except for teacher influence, the school context measures do not have a strong relationship with school size at the middle and high school levels.

School Contextual Factors and Teacher Retention

We use multinomial logistic regression to examine the relationship between the six school contextual factors and teacher retention decisions. Table 5 presents the results for first-year teachers with and without school contextual factors but including teacher characteristics and student demographics. Table 6 includes the estimates with each factor entered separately and a full model with all factors entered together. We present both results because of the relatively high correlation among the measures of school context. Both tables report the results as relative risk ratios, the odds of transferring or quitting relative to the odds of remaining in the same school.

The base model with only teacher characteristics and student demographics shows that, consistent with prior research, teachers are more likely to leave schools with a higher proportion of black and Hispanic students, both to transfer and to leave the district. New York City Teaching Fellows are more likely to transfer across schools than teachers from other routes, and teachers who passed the teacher certification exam on their first attempt are far more likely to leave teaching in New York City. Older teachers are also more likely to transfer to other schools and to leave teaching. The second set of columns in table 5 show that once we control for school context factors (presented in table 6), the coefficients on the proportion of black students and on the proportion of Hispanic students drop meaningfully. In addition, the point estimates are no longer statistically distinguishable from 1 (no effect) for the Hispanic-student concentration and are only distinguishable

from 1 for the black-student concentration for leaving New York City schools, not for transferring across schools.

Table 6 presents the results for specifications in which the six school context factors are added to the model, first separately and then simultaneously. All the variables in table 5 are included in the models reported in table 6, but the relative risk ratios associated with these variables are omitted for brevity. When we add each school contextual factor separately to this model, we find that all factors except safety significantly predict teachers' retention decisions. More specifically, in these estimates, the effect of the *respondents'* perceptions of teachers' influence is related the *respondents'* decisions to transfer but not to leave teaching in New York City; while their perceptions of administration, staff relations, students, and facilities are related to both their decisions to transfer and their decisions to leave teaching.

In the full model, including all six school contextual factors and the controls, the administration factor is the only one that significantly predicts teacher retention decisions after controlling for other school and teacher characteristics. Teachers who have less positive perceptions of their school administrators are more likely to transfer to another school and to leave teaching in New York City. A standard deviation increase in a teacher's assessment of the administration decreases his or her likelihood of transferring by approximately 44 percent relative to staying in the same school, and it decreases his or her likelihood of leaving teaching in New York City by approximately 28 percent relative to staying in the same school. If we use the coefficients in this model to predict the probability of a teacher transferring under different working condition, we estimate that if all the working conditions measures were average, a white female teacher from a college-recommended route in a school with average student composition would have a 7.6 percent probability of leaving and a 10.0 percent probability of transferring. If the working conditions measures were one standard deviation above average, these probabilities would drop to 4.1 percent and 6.7 percent; whereas if the working conditions measures were one standard deviation below average, these probabilities would increase to 13.5 percent and 14.8 percent. Working conditions, and especially administrative support, account for large differences in attrition rates.

To separate the effects of these school contextual factors from teacher characteristics, we also predict the retention of all other teachers at the school using the perceptions of the first-year teachers. More specifically, we use a school-level average for each factor based on the first-year teachers' survey responses to predict teacher retention decision for all teachers at the school excluding the first-year teacher respondents. As shown in table 7, similar to our previous analyses, when each school contextual factor is included separately, administration, staff relations, students, and facilities factors significantly predict decisions to transfer and to leave teaching in New York City. The more positive first-year teachers' assessments of these factors, the more likely other teachers at the school are to stay. Unlike the results for first-year teachers, perceptions of teacher influence significantly relate to decisions to leave teaching but not to transfer within New York City, and perceptions of safety relate to transferring but not leaving. In the model including all school context factors and controls, teacher influence is somewhat surprisingly positively associated with teachers' decision to transfer across schools. However, here again, administration emerges as the strongest predictor of retention relative to both transferring and leaving.

Teachers' Stated Reasons for Leaving or Considering Leaving

The longitudinal analyses presented above demonstrates that a teacher's reporting of working conditions predicts his or her own attrition in the following year as well as the attrition of other teachers in the school. The support of administrators emerges as a particularly important factor in retention decisions. While this type of longitudinal analysis reduces potential biases resulting from self-reports of working conditions linked to concurrent self-reports of satisfaction or plans for the future—data that many previous studies have used (see, for example, Ingersoll 2001 and Johnson and Birkeland 2003)—it is worth comparing these results to teachers' direct answers when asked why they left or why they considered leaving.

In surveys during fall 2005, we asked former teachers (who had left teaching after their first year, 2004-05) why they left, and we asked current teachers (now in their second year of teaching) who indicated that they had considered leaving their school about factors that led them to consider

leaving. Each group of teachers was asked four questions. The first asked them to indicate how important each of 12 factors was in their decision to leave their 2004-05 New York City teaching position using a five-point scale ranging from not important to extremely important. (These factors are listed in figure 1.) The second asked them to choose the one factor from this list that was their most important consideration. The third question asked them to indicate how important their dissatisfaction with each of 12 aspects of their job was in their decision to leave the New York City school where they taught in 2004-05. (These aspects are listed in figure 2.) Again, they were asked to rate each using a five-point scale ranging from not important to extremely important, and a follow-up question asked them to choose the one aspect they considered the most important in their decision to leave.

Dissatisfaction with job is the main factor that teachers cite for leaving or considering leaving. Figure 1 shows that for both current and former teachers, dissatisfaction with their jobs is by far the most important factor, with over 35 percent of both groups citing it as the most important reason for leaving or considering leaving. A fair number of former teachers also report the most important factor in their leaving was because they moved (living in a different place), because of other family or personal reasons, and because of other attractive job opportunities. These factors were not as important for teachers who were still teaching but had considered leaving. The next questions provides further insights into this job dissatisfaction factor, unpacking which aspects of first-year teachers' jobs were particularly dissatisfying and influential in their decisions to leave.

Each set of teachers was asked what aspect of their job most influenced their decision to leave or to consider leaving. As presented in figure 2, the dominance of dissatisfaction with administrative support is striking. Hardly any teachers cited dissatisfaction with colleagues, autonomy over the classroom, school facilities, respect from students and/or parents, ability to help students, emphasis on student testing, school safety, teaching assignment, teaching philosophy, or district policies as the primary reason for leaving or considering leaving. While over 15 percent of both groups reported dissatisfaction with student behavior as the most important factor influencing

their decision to leave their school, well over 40 percent of both groups identified dissatisfaction with the administration as the most important factor.

Other questions in the survey of former teachers also shed light on the importance of administrative support. In one question (not presented in the figures), former teachers on average indicated that they currently receive much more recognition and support from their administrators or managers than they had as teachers. Another set of questions asked the former teachers about the behaviors of their former principal. Less than 10 percent found their principal exceptional in communicating respect or appreciation for teachers, encouraging teachers to change teaching methods if students were not doing well, working with teaching staff to solve school or departmental problems, encouraging staff to use student assessment results in planning curriculum and instruction, or working to develop broad agreement among teaching staff about the school's mission. Additionally, almost 20 percent of former teachers reported that their principals never worked with staff to meet curriculum standards, and 30 percent stated that their principals did not encourage professional collaboration among teachers. Administration emerged as the main factor in teacher attrition in these surveys, just as it did in the analysis of actual attrition behavior above.

DISCUSSION

Teacher attrition may not be substantially higher than attrition from other professions (Henke, Zahn, and Carroll 2001). However, attrition at some schools is very high, high enough to disrupt instructional cohesion and likely disadvantage students. Prior research has shown clearly that these high-turnover schools are likely to serve large populations of low-performing, nonwhite, and low-income students, just the students most in need of a consistent and supportive school experience (Boyd et al. 2005; Carroll et al. 2000; Hanushek et al. 2004; Scafidi et al. 2005). While this previous research has identified the problem, it has done less to clarify why there is higher turnover at these schools and to identify fruitful avenues for reform.

There are indications that working conditions, aside from those directly resulting from student composition, affect teachers' career decisions. A relatively large literature has used cross-sectional

data to link teachers' self-reports of school working conditions to measures of their own satisfaction and plans for the future. This approach has the potential bias that less-satisfied teachers will misrepresent school working conditions and the correlations between working conditions and satisfaction will reflect only reporting bias and not true working conditions. Studies using the Schools and Staffing Surveys have estimated the relationship between self-reported working conditions and attrition (Grissom 2008; Ingersoll 2001) but even there, lack of controls for district differences and inaccurate self-reporting may bias the findings.

This study uses first-year teachers' reports of working conditions to assess the effect of working conditions on the turnover behavior of other teachers in the school. Since the reporting teachers and the teachers for whom we model turnover are not the same, we reduce the problem of self-reporting bias that is correlated with career decisions. We also triangulate our findings with teachers' own reports of why they left or considered leaving in a follow-up survey. While we address multiple measures of school context—including teachers' influence over school policy, the effectiveness of the school administration, staff relations, student behavior, facilities, and safety—the results of both analyses point to the importance of working conditions and particularly of administrative support in teacher retention.

In many ways, this is good news from a policy perspective for it is difficult to change the student demographics of a school, as evidenced by school desegregation policies. In contrast, school contextual factors such as administrative support are more policy-amenable. This study suggests that policies aimed at improving school administration may be effective at reducing teacher turnover. It is important to remember, however, that school administrators are subject to many of the same labor market dynamics as teachers. Horng, Kalogrides, and Loeb (2009) find, for example, that principals express preferences for schools with higher-performing students and lower concentrations of students in poverty and that principals, like teachers, move toward these more desirable schools when given the opportunity. Improving administrative support in high-turnover schools may require both more effective leaders, overall, and incentives (not necessarily monetary) so administrative positions in these schools become more appealing.

This study is clearly just a step in understanding the role of school context in teacher career decisions. It is imperfect in many ways. In particular, while we provide evidence that the school administration is an important factor in teacher retention decisions, our data do not provide enough richness about the role of administration to determine how or why administrative support affects teachers, nor do our data allow us to identify clear policy levers for reform. For example, one survey item asked teachers to rate the statement: “The school administration’s behavior toward the staff is supportive and encouraging.” Perhaps teachers consider “supportive and encouraging” administrators ones who promptly respond to teachers’ requests for classroom supplies, or maybe it’s ones who effectively handle student discipline issues. Additionally, what teachers consider “supportive and encouraging” may vary; for one teacher it may be being generally left alone and trusted with autonomy, while for another it may be administrators who frequently visit the classroom and provide feedback on instruction. Follow-up studies are necessary to investigate why administrative support is important to teachers and what particularly the administration does or does not do that influences a teacher to stay or leave. There is also a need to investigate other school contextual factors not included in this study that are likely to be important to teachers, such as teachers’ opportunities for collaboration, staff development, teacher autonomy, and school neighborhood characteristics.

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APPENDIX OF TABLES

Table 1
Descriptive Statistics from the First-Year Teacher Survey

	N	*Mean*	*SD*
Teacher Influence[a] *[α*[b] *= 0.784 (0.775)]*			
Selecting textbooks and other instructional materials	4,264	2.642	1.320
Selecting content, topics, and skills to be taught	4,266	2.887	1.266
Selecting teaching techniques	4,259	3.269	1.235
Evaluating and grading students	4,260	3.856	1.019
Disciplining students	4,261	3.598	1.113
Determining the amount of homework to be assigned	4,258	4.034	1.013
Administration[c] *[α = 0.887 (0.882)]*			
The school administration's behavior toward the staff is supportive and encouraging	4,271	3.348	1.296
The school administration usually consults with staff members before making decisions that affect us	4,262	2.621	1.228
The school administration has a well-planned and enforced school discipline policy	4,264	2.631	1.315
The school administration deals effectively with pressures from outside the school (for example, from the district or from parents) that might interfere with my teaching	4,258	3.062	1.186
The school administration does a good job of getting resources for this school	4,251	3.429	1.188
The school administration evaluates teachers' performance fairly	4,252	3.522	1.085
Data on student learning are regularly collected and reviewed with all members of the school community (teachers, administrators, etc.)	4,253	2.890	1.172
Staff Relations[c] *[α = 0.769 (0.759)]*			
There is a great deal of cooperative effort among the staff members	4,279	3.627	1.110
Most of my colleagues share my beliefs and values about what the central mission of the school should be	4,274	3.581	1.000
I make a conscious effort to coordinate the content of my classes with that of other teachers	4,269	3.567	1.028
I can get good advice from other teachers in this school when I have a teaching problem	4,274	4.076	0.872
In this school, I am encouraged to experiment with my teaching	4,269	3.174	1.224
Students[c] *[α = 0.683 (0.670)]*			
The level of student misbehavior in this school (such as noise, horseplay or fighting in the halls, cafeteria) interferes with instructional activities	4,280	3.755	1.280
The attitudes and habits students bring to my class greatly reduce their chances for academic success	4,272	3.770	1.191
Rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes	4,270	3.091	1.217
I get to know personally many students who are not in my classes	4,271	3.290	1.130
My students receive a lot of support for learning outside of school	4,261	2.423	1.128
Facilities[c] *[α = 0.715 (0.703)]*			
Necessary materials such as textbooks, supplies, and copy machines are available as needed by staff	4,276	3.024	1.313
My classroom is often uncomfortably warm or cold	4,275	3.093	1.256
I regularly see evidence of cockroaches, rats, or mice in this school	4,276	2.941	1.358
The textbooks that I use in class are up to date and in good physical condition	4,238	3.389	1.172
My school has quiet spaces for teachers to work when they are not teaching	4,272	2.916	1.307
The facilities at my school are conducive to effective teaching and learning	4,271	3.215	1.120
Safety[d]			
Has a student from this school threatened to injure you	4,198	0.299	
Has a student from this school physically attacked you	4,198	0.159	

[a] Responses were 1 (no influence), 2 (minimal influence), 3 (moderate influence), 4 (significant influence), 5 (a great deal of influence).

[b] One-sided confidence interval in parentheses which indicates that there is a 95% chance that the Cronbach's alpha will be higher than this value (Bleda and Tobias 2000).
[c] Responses were 1 (strongly disagree), 2 (disagree), 3 (neither agree or disagree), 4 (agree), 5 (strongly agree).
[d] There were only two safety items, so a factor score was not calculated. Instead, the variable created for the safety variables is the sum of the dichotomous items.

Table 2

Descriptive Statistics for First-Year Teachers and Schools

	N	*M*	*SD*
Teachers			
Age	3,810	29.517	8.163
Female	3,811	0.757	0.429
African American	3,709	0.121	0.326
Hispanic	3,709	0.099	0.299
White	3,709	0.698	0.459
Other nonwhite race or ethnicity	3,709	0.082	0.274
LAST passed on first attempt	3,735	0.912	0.283
LAST score	3,752	258.830	26.077
Pathway: college recommended	3,769	0.412	0.492
Pathway: New York City Teaching Fellows	3,769	0.357	0.479
Pathway: Teach for America	3,769	0.061	0.240
Pathway: temporary license	3,769	0.009	0.095
Pathway: individual evaluation	3,769	0.067	0.250
Pathway: other	3,769	0.093	0.291
Retention: same school within New York City	3,044	0.806	
Retention: different school within New York City	392	0.104	
Retention: left New York City	341	0.090	
Schools			
Students qualify for free lunch program	1,037	70.357	21.773
African American students	1,032	36.069	27.911
Hispanic students	1,032	41.414	25.235
Enrollment	1,032	799.521	633.834
Elementary school	993	0.571	
Middle school	993	0.188	
High school	993	0.241	
School context measures			
Teacher influence	1,101	0.969	0.782
Administration	1,094	0.099	0.081
Staff relations	1,097	0.060	0.728
Students	1,095	0.094	0.857
Facilities	1,097	0.085	0.770
Safety	1,093	2.534	0.558

Table 3

Correlations between School Context Measures (*n* = 1,350)

	1	*2*	*3*	*4*	*5*	*6*
1. Teacher influence	---					
2. Administration	0.365	---				
3. Staff relations	0.237	0.525	---			
4. Students	0.315	0.612	0.429	---		
5. Facilities	0.144	0.651	0.447	0.549	---	
6. Safety	0.144	0.353	0.202	0.423	0.314	---

Note. All correlations are significant at $p < .001$.

Table 4

Correlations between School Context Measures and School Characteristics by School Level

	Free lunch	*Black*	*Hispanic*	*Enrollment*
Elementary (*n* = 747)				
Teacher influence	-0.194***	-0.126**	-0.010	-0.109**
Administration	-0.326***	-0.284***	-0.161***	-0.054
Staff relations	-0.277***	-0.119**	-0.181***	-0.056
Students	-0.462***	-0.454***	-0.163***	-0.016
Facilities	-0.339***	-0.238***	-0.143***	-0.092*
Safety	-0.239***	-0.260***	-0.084*	0.106*
Middle (*n* = 225)				
Teacher influence	-0.213**	-0.034	-0.084	-0.204*
Administration	-0.258***	-0.189**	-0.164*	0.086
Staff relations	-0.289***	-0.143*	-0.108	0.027
Students	-0.393***	-0.247***	-0.166*	0.072
Facilities	-0.359***	-0.211**	-0.246***	0.029
Safety	-0.299***	-0.248***	-0.042	0.085
High (*n* = 322)				
Teacher influence	0.023	-0.110	0.082	-0.265***
Administration	-0.071	-0.135	-0.044	-0.019
Staff relations	-0.216***	-0.041	-0.188	-0.019
Students	-0.293***	-0.322***	-0.234***	0.053
Facilities	-0.088	-0.052	-0.193**	-0.116
Safety	-0.128*	-0.298***	0.052	0.041

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 5
Multinomial Logistic Regression Models for First-Year Teachers

	Without School Contextual Variables		*With School Contextual Variables*	
	Transferred	*Left*	*Transferred*	*Left*
School: free lunch	0.993	0.998	0.992	0.997
	(0.005)	(0.004)	(0.005)	(0.004)
School: African American	1.010*	1.015**	1.004	1.009*
	(0.004)	(0.004)	(0.005)	(0.004)
School: Hispanic	1.011*	1.012*	1.005	1.006
	(0.005)	(0.005)	(0.006)	(0.005)
School: total enrollment	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)
School: middle	2.202**	1.804**	2.088**	1.658**
	(0.382)	(0.293)	(0.372)	(0.294)
School: high	0.985	0.998	1.069	0.982
	(0.185)	(0.184)	(0.219)	(0.198)
Pathway: independent	1.215	1.017	1.175	0.991
	(0.294)	(0.270)	(0.290)	(0.264)
Pathway: Teaching Fellows	1.600**	0.723	1.524**	0.691*
	(0.248)	(0.127)	(0.242)	(0.122)
Pathway: Teach for America	1.033	0.464*	0.940	0.401**
	(0.300)	(0.157)	(0.272)	(0.137)
Pathway: temporary license	1.827	0.572	1.878	0.612
	(1.056)	(0.602)	(1.090)	(0.642)
Pathway: other	1.265	1.341	1.229	1.295
	(0.269)	(0.291)	(0.265)	(0.287)
Teacher: female	0.892	0.953	0.876	0.948
	(0.121)	(0.138)	(0.120)	(0.140)
Teacher: African American	0.827	0.720	0.810	0.707
	(0.156)	(0.157)	(0.158)	(0.155)
Teacher: Hispanic	0.691+	0.999	0.679	0.987
	(0.152)	(0.231)	(0.152)	(0.229)
Teacher: other ethnicity	0.966	0.740	0.982	0.737
	(0.208)	(0.199)	(0.216)	(0.201)
Teacher: Age	1.022**	1.020*	1.023**	1.020*
	(0.007)	(0.008)	(0.007)	(0.008)
Teacher: Passed LAST 1st try	1.379	2.246*	1.449	2.351*
	(0.405)	(0.827)	(0.432)	(0.880)
Teacher: LAST exam score	0.994	1.004	0.993*	1.002
	(0.003)	(0.004)	(0.004)	(0.004)
Number of observations	3,298		3,298	
Chi^2	147.999		226.264	
Pseudo R^2	0.037		0.054	

Note. Relative risk ratios (standard errors in parentheses) where comparison group is "stay in same school."
* $p < 0.05$, ** $p < 0.01$

Table 6

Summary of Multinomial Logistic Regression Models for First-Year Teachers

	Model with School Factors Entered Separately		*Full Model*	
	Transferred	*Left New York City*	*Transferred*	*Left New York City*
Teacher influence	0.792**	0.961	1.085	1.249**
	(0.078)	(0.100)	(0.117)	(0.141)
Administration	0.541***	0.652***	0.552***	0.692**
	(0.060)	(0.059)	(0.083)	(0.096)
Staff relations	0.653***	0.717**	0.874	0.884
	(0.065)	(0.078)	(0.108)	(0.119)
Students	0.677***	0.739**	1.103	1.041
	(0.084)	(0.090)	(0.168)	(0.169)
Facilities	0.640***	0.671***	0.956	0.840
	(0.070)	(0.072)	(0.125)	(0.123)
Safety	0.710	0.782	0.925	0.940
	(0.098)	(0.115)	(0.144)	(0.157)

Notes: Relative risk ratios (standard errors in parentheses) where comparison group is "stay in same school." These models include controls for student demographics, school grade level, school enrollment, teacher demographics, and teacher preparation experiences. Relative risk ratios for control variables are not shown here for brevity.

*p < .01 **p < .05 ***p < .001

Table 7

Summary of Multinomial Logistic Regression Models for All Teachers Excluding Survey Respondents

	Model with School Factors Entered Separately		*Full Model*	
	Transferred	*Left New York City*	*Transferred*	*Left New York City*
Teacher influence	1.018	0.905*	1.201**	0.987
	(0.060)	(0.037)	(0.076)	(0.044)
Administration	0.719***	0.822***	0.679***	0.859*
	(0.041)	(0.031)	(0.053)	(0.051)
Staff relations	0.790**	0.888**	0.878	0.986
	(0.052)	(0.036)	(0.064)	(0.049)
Students	0.829**	0.872**	1.054	0.990
	(0.051)	(0.040)	(0.078)	(0.060)
Facilities	0.857**	0.860***	1.094	0.964
	(0.049)	(0.037)	(0.087)	(0.054)
Safety	0.837*	0.889	0.916	0.969
	(0.071)	(0.049)	(0.082)	(0.058)

Note. Relative risk ratios (standard errors in parentheses) where comparison group is "stay in same school. These models include controls for student demographics, school grade level, school enrollment, teacher demographics, and teacher preparation experiences. Relative risk ratios for control variables are not shown here for brevity.

*p < .01 **p < .05 ***p < .001

Figure 1. **Most Important Factor in Decisions to Leave Teaching for Former (*n* = 386) and Current Teachers (*n* = 1,587)**

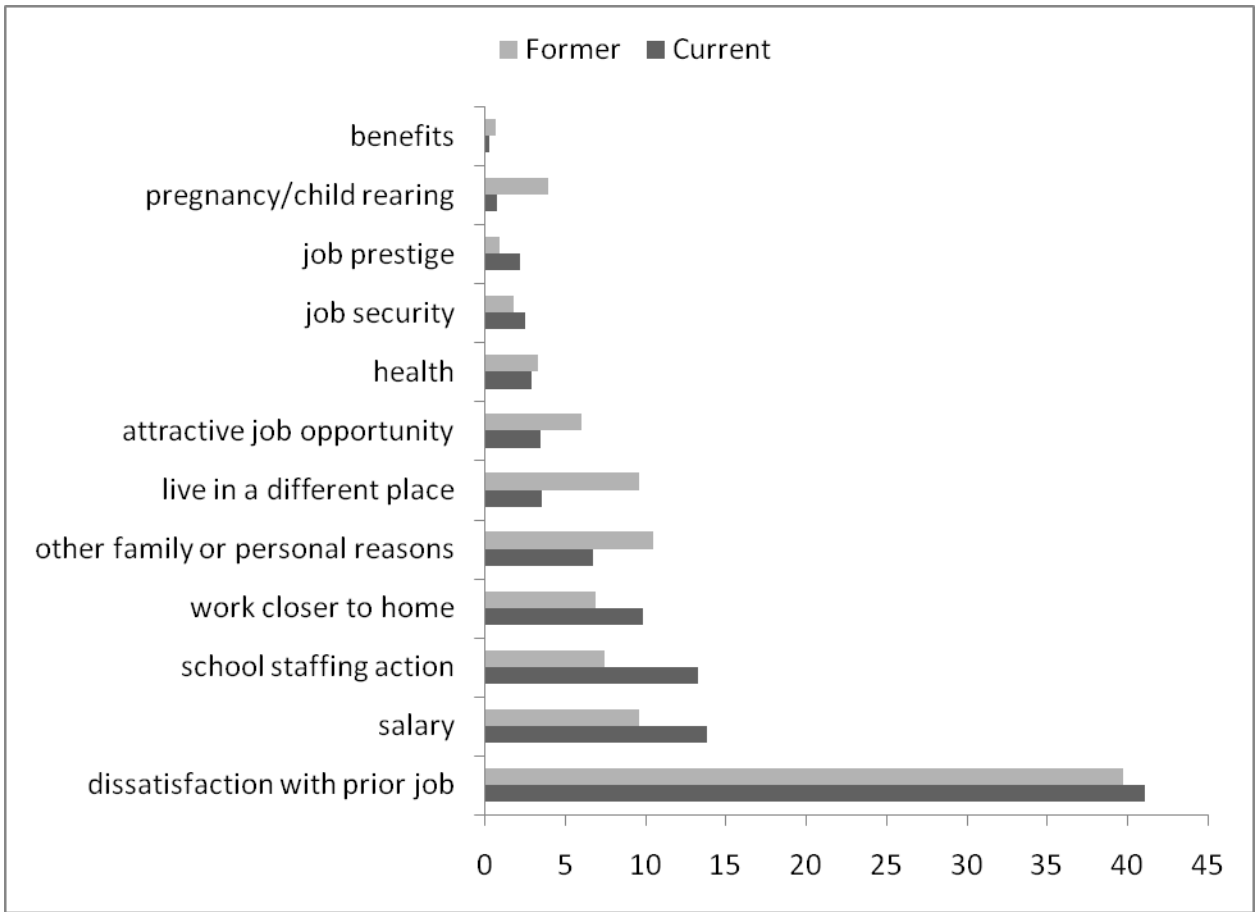
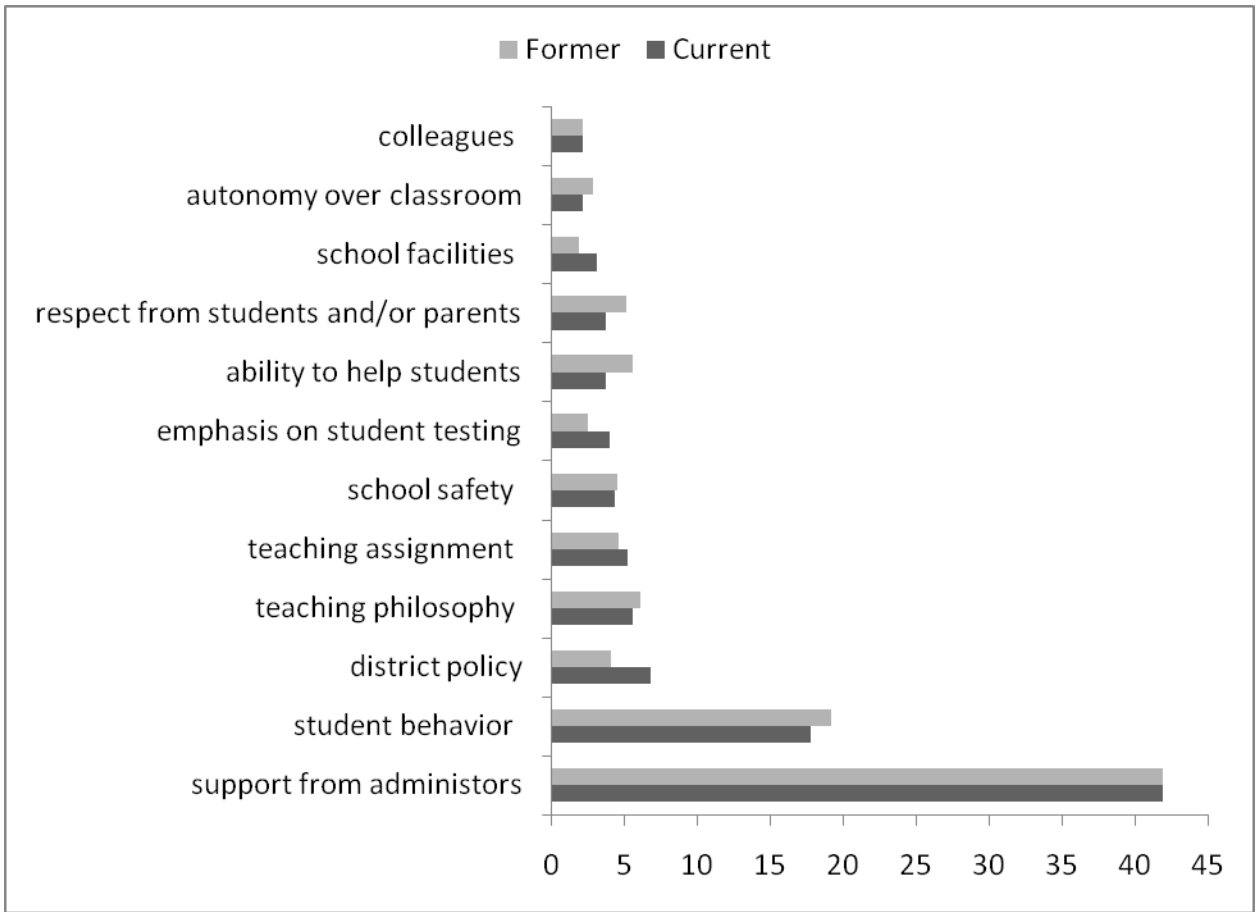


Figure 2. **Most Important Aspect of Job Influencing Decisions to Leave Teaching for Former (*n* = 386) and Current Teachers (*n* = 1,587)**

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