Leaving to Fit In: School Leadership, Peer Teacher Relationships, and Turnover Among Teachers of Color in New York City

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Disparate turnover among teachers of color remains a persistent educational challenge, yet little research explores the link between school leadership, peer teaching staff, and turnover disparities. This study explores whether principal and peer teacher demographics predict teacher turnover in New York City, and whether they do so differently for teachers of color. We find teachers are less likely to exit when their principal and a higher share of peer teachers are of the same race/ethnicity, with Black teachers having especially lower transfer rates with a higher share of Black peer teachers. However, results suggest school leadership style and positive teacher relationships are not differentially associated with turnover for teachers of color. We conclude with a discussion of implications.

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Abstract

Retention of teachers of color remains a persistent educational challenge, yet little research explores the link between school leadership, peer teaching staff, and turnover disparities for teachers of color. This study explores whether principal and peer teacher demographics predict teacher turnover in New York City, and whether they do so differently for teachers of color. We find teachers are less likely to exit when their principal and a higher share of peer teachers are of the same race/ethnicity, with Black teachers having especially lower transfer rates with a higher share of Black peer teachers. However, results suggest school leadership style and positive teacher relationships are not differentially associated with turnover for teachers of color. We conclude with a discussion of implications.

Keywords

Teacher Research • Teacher Characteristics • Retention • Race • Principals • Survey Research • Regression Analyses

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Introduction

The evidence abounds concerning the benefits of a racially diversified teaching workforce to student learning, particularly for students who have been historically underserved by the K–12 education system within the United States (Grissom et al., 2015; Easton-Brooks, 2019; Villegas & Irvine, 2010). A number of studies—spanning numerous contexts and employing a variety of methods—provide compelling evidence that increased racial and ethnic representation within the educator workforce is associated with higher child engagement and motivation (Rasheed et al., 2019); improved student achievement (e.g., Dee, 2004, 2005); reduced absenteeism (Holt & Gershenson, 2017); more favorable placement into gifted programs and special education services (Grissom & Redding, 2016; Grissom et al., 2017); increased enrollment and performance in advanced courses (Hart, 2020); and lessened exclusionary discipline outcomes (Lindsay & Hart, 2017) for students of color. Moreover, prior evidence suggests students of color experience positive outcomes from being paired with instructors of color well beyond the secondary grade level, as they are more likely to graduate high school, enroll in college, and receive higher course grades when in college (Birdsall et al., 2018; Gershenson et al., 2018). Some scholars argue that increased representation of teachers of color within the workforce extends to White students as well by fostering interracial understanding, multicultural awareness, and respect for authority figures of color during a critical phase of child development (Nevarez et al., 2019; Wells et al., 2016). Such benefits may redress concerns that any increase in the representation of teachers of color in the teaching profession may somehow detriment White students, especially considering empirical evidence to suggest that students of *all* racial and ethnic backgrounds view teachers of color more favorably (Cherng & Halpin, 2016).

However, retention of teachers of color within the profession remains a persistent educational challenge. Previous national studies document higher turnover rates for teachers of

color compared to those for White teachers (Achinstein et al., 2010; Ingersoll et al., 2019). Moreover, the turnover gap for teachers of color has widened in the last decade (Ingersoll et al., 2019), thus highlighting the complexity of retaining a promising human resource capable of allaying educational gaps for historically underserved students. In light of these trends, there is a growing desire among various education stakeholders—researchers, policymakers, administrators, and advocates alike—to understand the determinants of the disproportionate turnover patterns endemic among teachers of color and to seek solutions to better augment a more diverse educator pipeline (e.g., Dixon et al., 2019).

Scholars and policymakers have long conjectured that school context and working conditions are crucial factors affecting teacher turnover decisions (e.g., Kraft et al., 2016; Ladd, 2011; Simon & Johnson, 2015). In this manner, organizational fit and demographic similarity appear to be salient factors theorized to specifically affect workplace preferences for teachers of color (Allport, 1954; Bednar & Gicheva, 2019; Byrne, 1971; Pfeffer, 1985). The extant research examining the underlying antecedents for disparate turnover among teachers of color has largely relied on qualitative accounts and descriptive surveys to understand the factors affecting turnover decisions for current or former teachers of color (e.g., Ahmad & Boser, 2014; Sutcher et al., 2016). Notably absent from the literature is a comprehensive quantitative analysis of the relationship between the demographic composition of school staff, perceptions of staff relationships, and turnover patterns for teachers of color. While few quantitative studies have shown that racial congruence among peer teachers and school leaders predicts lower turnover for teachers of color (Grissom & Keisser, 2011; Strunk & Robinson, 2006), they do not fully explore disparities in teacher turnover beyond a crude White/non-White categorization of race nor do they explore whether perceptions of teacher and school leader relationships differentially predict turnover patterns for teachers of color. A deeper inquiry into these areas would offer valuable insights into

workforce behaviors and systemic hurdles that may threaten efforts to diversify the teacher workforce. An investigation of this kind can serve the field's evaluation of retention strategies and professional development support for both teachers and school leaders.

The purpose of this study is to further investigate the drivers that contribute to the disparate turnover rates among teachers of color. We focus on New York City (NYC) as an empirical case and use longitudinal survey and administrative data over a seven year period. We explore how the relationship between the racial/ethnic demographic composition of principals and peer teachers, measures of school leadership and teacher relationships, and transfer and attrition patterns differ for teachers of color. More specifically, we ask:

1. Does the demographic makeup of principals and peer teacher colleagues within a school influence teacher turnover patterns differentially for teachers of color?

2. And, do school leadership style and peer teacher relationships differentially affect turnover among teachers of color?

We find that teachers are less likely to exit the teaching profession when paired with a principal of the same racial/ethnic background as well as when located in schools where a larger share of teachers are of the same racial/ethnic background. Moreover, results suggest that the differences in the likelihood of transferring are especially prominent among Black teachers when located in schools with a higher share of Black peer teachers. Additional analyses indicate that, while school leadership style and the quality of teacher relationships within a school are predictive of teacher turnover patterns, these factors do not explain disparities in turnover for teachers of color.

Theory and Prior Empirical Literature

Prior research has explored the determinants of teacher turnover largely through the economic lens of labor supply and demand models that aim to explain the interaction between teachers as laborers and schools as employers (e.g., Haggstrom et al., 1988; Ingersoll, 2001). The

level of compensation and nonpecuniary benefits—such as working conditions, school location, and administrative support—are positioned as central determinants of teacher labor supply and demand within an economic framework (e.g., Borman & Dowling, 2008; Farinde et al., 2016; Grissom et al., 2016; Ladd, 2011; Kulka-Acevedo, 2009; Sutcher et al., 2016).

However, when considering turnover specifically among teachers of color, an economic lens offers but few possible explanations for disparate turnover patterns compared to those of White teachers. School preferences for teachers of color may deviate from White teachers and the schooling environments in which teachers of color typically desire to work may be more conducive to higher teacher turnover. In fact, prior research provides suggestive evidence that teachers of color—Black and Hispanic[2] teachers in particular—tend to work in under-resourced schools with ostensibly more challenging behavioral climates (Kulka-Acevedo, 2009; Simon & Johnson, 2015). Alternatively, the under-representation of teachers of color in well-resourced schools may, in some contexts, reflect implicit or explicit discriminatory hiring practices (D'amico et al., 2017) or systematic differences in qualifications or experience among the pool of teaching candidates. However, national estimates do not provide compelling evidence of stark and directionally consistent differences in degree attainment and experience by teacher race/ethnicity (de Brey et al., 2019), as teachers of color demonstrate higher levels of teaching experience and degree attainment in specific contexts (e.g., Sun, 2018), which challenges the deficit-based notion that systemic differences in qualifications is a driving force undergirding their under-representation in well-resourced schools.[3]

Economic theories, while useful for understanding the dynamics of the general labor market, are arguably insufficient to holistically understand the disparate retention of teachers of color. More specifically, economic models of supply and demand do not consider how racialized social interactions of the schooling environment might affect teacher turnover; however,

theoretical frameworks originating from and applied within the fields of sociology, industrial and organizational psychology, organizational behavior, and human resource management do. In the following section, we highlight a few of the more prominent frameworks from these fields that can more readily explain turnover disparities for teachers of color.

Relational Demography and the Similarity-Attraction Paradigm

The study of the relationship between demographic characteristics of employees and their behaviors and perceptions has been a longstanding tradition in industrial and organizational psychology. Early studies situated within the literature on "organizational demography" (Pfeffer, 1985) focused on the compositional or distributional demographic characteristics of an organization such as age, race, and gender and their relation with organizational outcomes such as innovation, hiring and promotion decisions, and employee performance and turnover (Pfeffer, 1985; Wagner et al., 1984). Later studies concerned themselves with the study of "relational demography," or the connection between two or more individuals *within* an organization to better understand how individual demographic differences between subordinates and their superiors affect employee behavior and attitudes, such as job satisfaction, performance, and turnover (O'Reilly et al., 1989; Tsui & O'Reilly, 1989).

The conceptual mechanisms underlying the study of organizational and relational demography primarily originate from the similarity-attraction paradigm, which maintains that individuals are most attracted to those who share similar attitudes, beliefs, or personality traits that are signaled through a number of observable physical or social status traits (Byrne, 1971). Pfeffer (1985) proposes the underlying hypotheses that link organizational demography to organizational performance is that demographic homogeneity infers similarity to employees, which can affect relative cohesiveness and social integration within an organization (Tsui & O'Reilly, 1989). Social integration and cohesion of employees may manifest as increased frequency of communication or

improved quality of mentoring relationships and networks, which may, in turn, increase employee productivity, advancement, job satisfaction, and attachment to an organization (Tsui & O'Reilly, 1989; Zatzick et al., 2003). In this regard, individuals who leave an organization are more likely to be dissimilar from others remaining in the organization, whether that be with respect to specific personality traits or demographic characteristics, such as race or ethnicity.

Few scholars have explicitly drawn on the concept of similarity-attraction to study how the organizational demography of schools affects teacher attitudes and behavior. For instance, Renzulli et al. (2011) explored how the racial composition of students within a school is associated with teacher satisfaction and subsequent teacher turnover and found that teacher racial mismatch with the student population is predictive of lower satisfaction among White teachers and increased turnover; however, they did not consider how demographic match among education staff affected satisfaction and turnover intentions.

Theories on Self-Categorization, Social Identity, and Social Isolation

Other theories center a teacher's sense of belonging and isolation as the underlying mechanisms for why the demographics within a school's environment might matter for teacher turnover. Theories on social identity, self-categorization, and social isolation operate in tandem to explain how the racial/ethnic similarity of school staff may predict disparate turnover patterns for teachers of color. Social identity theory posits that an individual gains more utility in a group setting if other members of the group are of a similar type (Bednar & Gicheva, 2019). Moreover, self-categorization theory proposes that demographic characteristics, and particularly race and ethnicity, are salient traits through which individuals categorize themselves as part of a group (Stangor et al., 1992). Jointly, both theories suggest that an individual is likely to seek out interactions with their own racial/ethnic group and avoid interactions with members of other groups to reinforce positive self-images associated with their racial/ethnic identity (Tajfel, 1982).

In an employment context, workers—such as teachers—may seek to work with colleagues of a similar racial background to preserve their social identity. Further, social isolation theory holds that as a group that is less connected to dominant culture increases in size within an organization, social contact among members of the group becomes more frequent, thus reducing feelings of loneliness and social isolation (Leonard & Levine, 2006). In contrast, working in an organization where most colleagues are of different race/ethnicity may heighten an individual's feeling of dissimilarity and isolation. In turn, dissimilarity among colleagues and superiors may hinder social integration, job satisfaction, and commitment to remain in the organization (Riordan & Shore, 1997).

Several studies draw on identity-based self-categorization and social isolation within the workplace to better understand the effect of an organization's demographic composition on employee cohesion and turnover (e.g., Bryk & Schneider, 2002; Gottlieb, 1964; Mueller et al., 1999). For example, social identity theory was one of several frameworks that Zatzick and colleagues (2003) drew on to examine voluntary turnover among workers of color in a large organization in which they found that the likelihood of individual turnover non-linearly decreased as the proportion of peer and senior employees of a similar racial background increased. Bristol and Shirrell (2019) similarly drew on social isolation theory to examine work-related social networks among staff of color in two mid-sized public school districts. In one of the two studied districts, staff of color were less likely to seek out advice when located in schools wherein they were the only staff member of color. While not consistent across district settings, the presence of such social patterns were suggestive of the salience of social identity and social isolation in how staff interact with their professional colleagues particularly in contexts where they were the lone member of a minoritized group.

School Leadership, Teacher Relationships, and Teacher Turnover

Considering the collective forgoing theories, there is substantial theoretical basis to hypothesize that the demographics of school leadership and peer teaching staff may affect turnover patterns for teachers of underrepresented groups. Indeed, some scholars have sought to explore these links empirically. For instance, using a nationally representative sample of teachers and principals made available through the 1999–2000 Schools and Staffing Survey (SASS), Strunk and Robinson (2006) found that, in accordance with social identity theory, teachers are less likely to leave their school if the teaching staff's racial composition is more matched to their own race/ethnicity. Grissom and Keisser (2011) similarly used the later 2003–2004 wave of SASS in conjunction with the 2004–2005 Teacher Follow-Up Survey (TFS) to find that—in addition to having higher job satisfaction and, in some instances, higher supplemental pay—teachers are less likely to turnover when supervised by a principal of the same race. However, due to limited racial/ethnic diversity within the utilized samples, both studies were limited in their ability to fully disaggregate the differential effects on turnover across Black and Hispanic teacher groups.

Yet theories on similarity-attraction and social isolation described herein place emphasis on the social interactions underlying demographic similarity and match of employees to highlight how marginalized individuals are particularly affected by the quality of interactions with their colleagues and supervisors. These theories suggest that in the absence of shared background with colleagues and supervisors teachers who identify with the racial/ethnic minoritized group within their school may be more likely to experience a lack of support from and trust with their colleagues and school leaders—however, with greater access to more positive professional relationships and leadership, they may become more willing to remain in their school (Riordan & Shore, 1997; Zatzick et al., 2003).

A robust body of scholarship corroborates the importance of effective school leadership to teacher retention (Boyd et al., 2011; Fuller et al., 2016; Grissom, 2011; Kraft et al., 2016; Ladd,

2011). Based on a review of prevailing literature on teacher turnover in high-poverty schools,

Simon and Johnson (2015) developed a framework that highlights the salience of school leadership

to teacher retention, and identifies a principal's effectiveness at fulfilling a multifaceted role as a

general manager, instructional leader, and inclusive decision-maker as critical factors that are

important to teachers. Above all, principals are tasked with communicating and executing a clear

school vision that centers student learning and makes clear the expectations for teaching (Simon &

Johnson, 2015). Many examples arise from the empirical literature to evidence how school leaders,

and principals in particular, affect the workplace conditions of teachers, including investing in

teaching and support staff committed to their school's mission (Balu et al., 2009-2010); creating

formal systems that support and develop instruction and reward good teaching (Borman &

Dowling, 2008); facilitating trust, collaboration, and professional advancement among and for

teaching staff (Bryk & Schneider, 2002); and sheltering teachers from political situations and

external demands that detract from teaching duties (Acheinstein et al., 2010). Numerous studies

reinforce the importance of these leadership characteristics to teacher retention, particularly

schools in urban and high-poverty contexts (Boyd et al., 2011; Ladd, 2011; Kraft et al., 2016;

Scallion et al., 2021).

In their same review, Simon and Johnson (2015) identify collegial teacher relationships as

yet another factor that influences teacher turnover intentions. Research reports a clear connection

between teachers' relationships with peer teachers and their continued commitment to teaching at

their school and specifically highlights the presence of inclusivity, respect, and trust; formal

structures for support and collaboration; and a shared sense of professional goals among teachers

as factors affecting a teacher's decision to remain in their school (Fuller et al., 2016; Guarino et al.,

2006; Kraft et al., 2016). As previously noted, while school leaders create conditions for

productive collegial relationships among teachers, a sense of collaboration, trust, and community require teachers' involvement and input as well (Simon & Johnson, 2015).

Unfortunately, little research has disentangled the differential effects that positive school leadership and teacher relationships have on the probability of turnover specifically for teachers of color. Prior work by Farinde-Wu (2018) reveals that Black women teachers who questioned their retention identified administrative support, broadly defined, as particularly crucial to meet the psychological, socio-emotional, and academic needs of their students, however, the scope of the study did not involve examining the comparability of the salience of leadership to turnover across teachers of different racial/ethnic backgrounds. To our knowledge, the only quantitative study to do so is an analysis of the Schools and Staffing Survey by Bednar and Gicheva (2019), which found that principal support is most strongly associated with retention for teachers of color in schools where they are underrepresented. According to their study, in non-diverse schools a one standard deviation (SD) increase in perceived administrative support was associated with a 2.5 percentage point decrease in the probability of school exit for teachers of color, a magnitude of change that was over twice as large compared to that of White teachers (Bednar & Gicheva, 2019). Yet these findings do not inform whether there are differential relationships between administrative support and turnover across distinct racial subgroups of teachers of color, as their analysis considered teachers of color a monolithic group.

Our current study seeks to extend the robust research base on teacher turnover by examining whether the racial composition of both school leaders and peer teachers as well as perceived school leadership and teacher relationships differentially predict turnover intentions for teachers of color. We do so by utilizing data from NYC, a demographically and racially diverse setting that permits us to explore relationships beyond the White/non-White dyad commonly explored in prior studies.

Data and Methods

This study relies on three sources of longitudinal and administrative data provided by the

New York City Department of Education (NYC DOE), including (1) human resource data, which

include information on teacher and principal school assignments as well as information on teacher

and principal demographic and background characteristics; (2) teacher responses to the annual

NYC School Survey, which provide items that probe teachers' perceptions of school leadership

and sentiments of trust among the teaching staff in their school; and (3) school administrative data,

which provide a variety of school characteristics.

The human resource data capture background and demographic information on all

employees—teachers and principals—hired by the NYC DOE, including their school assignment,

role at the school, salary, education history, experience, gender, and racial and ethnic background.

We use these data to identify when a teacher moves from their assigned school in a given year.

Consistent with prior research on teacher turnover (Kraft et al., 2016; Boyd et al., 2011), we

distinguish between "movers" and "leavers" to identify whether teachers transferred within the

NYC public school system or exited the system entirely by the next academic year.

The NYC School Survey is administered annually to all parents, teachers, and students

throughout the public school system. The survey is designed to help school leaders better

understand the experiences of their community members and to diagnose areas to improve the

learning environment in their school. This study primarily focuses on survey responses from

teachers to better understand how their perceptions of their principal and peer teaching staff relate

to their patterns of turnover. While the survey was first administered during the 2006–07 academic

year, we began our analysis in 2011–12. Over the years, there have been several rounds of redesign

of the survey questions. However, from 2011–12 onward, survey questions of interest to our study

remained consistent and unchanged. Responses to the survey are reasonably reflective of the

broader population of NYC public school teachers due to the fairly high and stable response rates. The overall teacher response rates ranged from 81 to 83 percent during the years of our study and response rates at the school level varied moderately across schools within a given year, as shown in appendix Table A.1. We describe our analytic treatment of the survey measures of interest in the following section.

NYC school administrative data provide the third and final source of data for the study, and include information on school grade configuration, student enrollment, and school-level student and teacher demographic and background characteristics.

The study's final analytic sample comprises data spanning seven years beginning in the 2011–12 academic year and ending 2017–18. A comprehensive set of descriptive summary statistics for the overall analytic sample and by teacher race/ethnicity is provided in appendix Tables A.2 and A.3.[4,5] Similar to the national demographic of the teaching workforce, an overwhelming majority of teachers in NYC are female (about 78 percent) and White—Black teachers compose only 17 percent of the teacher population while Hispanic and Asian teachers compose 15 and 6 percent, respectively. On average, approximately 49 percent of teachers have more than 10 years of teaching experience and 82 percent have completed studies beyond a Master's degree. There are some notable differences across teacher racial/ethnic subgroups. For instance, on average, Black teachers have more teaching experience—and, relatedly, higher salaries—than teachers of other racial/ethnic backgrounds while a lower share of Hispanic teachers has completed studies beyond a Master's degree. Across the entire sample, approximately 50 percent of teachers work in a school with a principal of the same race/ethnicity. White teachers are noticeably the most likely to work in a school with a principal of the same race/ethnicity (62 percent) while, in contrast, approximately 50 percent of Black teachers work in a school with a Black principal and only 30 percent of Hispanic teachers work in a school led by a Hispanic

principal. However, Asian teachers and teachers of other extremely underrepresented racial/ethnic

backgrounds are the least likely to work in schools led by a principal of a similar racial/ethnic

background (approximately nine and five percent, respectively); because of the low incidence of

racial/ethnic match of these groups, the remainder of our study analyzes the effects of teacher-

principal racial congruence for these groups jointly.

Constructing Measures of School Leadership and Teacher Relationships

The NYC School Survey data provide approximately 456,000 teacher-year survey

responses across the seven years under study (2011–2012 through 2017–2018). In any given year,

the survey comprises responses to between 20 to 30 items coded on a Likert scale. For this study,

we primarily limited our analysis to items probing teachers' perceptions of school leadership

within their school or relations with peer teachers. After disregarding items that were not

consistently available across the seven-year panel, we arrived at a set of five items related to

school leadership and one related to peer teacher relationships (i.e., "Teachers in the school trust

each other"). Appendix Table A.4 provides a description of all survey items.

As there are multiple survey items probing teachers about their perceptions of school

leadership, we conducted exploratory factor analysis to alleviate multicollinearity and the prospect

of Type II error; such a technique to reduce the dimensionality of a set of variables is common in

survey research aiming to measure aspects of school environment (e.g., Kraft et al., 2016; Loeb et

al., 2005; Ladd, 2011). The Bartlett's sphericity test ($p<0.001$) and Kaiser-Meyer-Olkin Index

($KMO = 0.909$) both indicate sufficient correlation and adequate overlap among the five items

considered in the factor analysis, which ultimately led us to retain one orthogonal dimension of

variation from the school survey item responses that explained about 85 percent of the total item

variance. Visual examination of the scree plot aligned with the Kaiser-Guttman stopping criteria to

suggest a "breaking point" after the first factor, as the items did not capture other meaningful

dimensions. We interpret the singular measure as a measure of "Effective School Leadership"—factor loadings associated with the five items exceeded 0.89, suggesting that all items loaded strongly onto the factor.

The NYC DOE only permits the use of anonymized individual teacher survey responses for the purpose of external research. Therefore, as the teacher survey data are only linkable at the school level, following prior studies using teacher responses to the NYC School Survey (e.g., Kraft et al., 2016) we calculated factor scores for each teacher in each year and then averaged these scores across all teachers within a school to the school-year level. Thus, the averaged factor scores at the school-year level represent school-wide teacher perceptions of school leadership. In addition to the constructed factor measuring effective school leadership, as there was only one item on teacher perceptions of peer teacher relationships, we similarly aggregated individual survey responses measuring teacher relationships to the school-year level to represent the percentage of teachers who agree that teachers trust each other in a specific school and year. As shown in appendix Figure A.1, we then standardized each of these school-year-level averages across all schools to have a mean of zero and standard deviation of one to facilitate comparisons across both measures.

We examined the correlations between the measures of school leadership and teacher relationships with other time-varying school-level characteristics observable in the data (Figure A.2). We find that teacher perceptions of effective school leadership and trust among peer teachers are, in general, significantly correlated with the identified school characteristics, however, the correlations are small in magnitude.

Empirical Strategy

To examine the relationship between the demographic composition of school education staff and teacher turnover, we start with a descriptive approach by exploring year-by-year variation

disaggregated by teacher-principal race congruence and the percentage of peer teachers within a

teacher's school who are of the same race/ethnicity. We build on this crude descriptive analysis by

employing regression methods specified to isolate within-school variation over time, which serves

as the primary identification strategy of this study. Standard errors for all models are adjusted for

clustering at the school-year level to account for the nested nature of the data.

In our first set of regression analyses, we estimate a series of linear probability models

(LPM)[6] expressed as follows:

$$Y_{jst} = \alpha_0 + \alpha_1 Trace_{jst} + \alpha_2 Prace_{st} + \alpha_3 RaceMatch_{jst} + \eta' X_{jst} + \varphi' S_{st} + \lambda_s + \gamma_t + u_{jst}, \quad (1)$$

where the Y_{jst} term represents two separate dichotomous indicators for whether teacher j in school

s during time t (a) transferred schools or (b) exited from the NYC public schooling system the

following year. Teacher turnover is modeled as a function of $Trace_{jst}$, which represents a teacher's

racial/ethnic background (operationalized to distinguish between White, Black, Hispanic, and

teachers of extremely underrepresented racial or ethnic backgrounds)[7]; $Prace_{st}$, which represents

the principal's racial/ethnic background; and $RaceMatch_{jst}$, which represents whether a teacher

and principal share the same racial/ethnic background. In addition, equation (1) controls for other

observable teacher characteristics, represented by the vector X_{jst}, which includes teacher gender,

teaching experience, education level, age, and salary, and observable time-varying school

characteristics, represented by the vector S_{st}, which includes averaged teacher characteristics,

principal characteristics (gender and experience), student enrollment (logged), student attendance

rate, pupil-teacher ratio, average student characteristics (gender, race, free/reduced-price lunch

status, special education status, limited English proficiency status), and—as a measure of school

behavioral climate—the percent of teachers who agreed order and discipline are maintained at their

school on the annual NYC School Survey. To isolate within-school variation over time, we

adjusted for school fixed effects (λ_s), and similarly adjusted for year fixed effects (γ_t) to account

for year-specific factors affecting staff compositions within schools and teacher turnover.

The primary coefficient of interest in equation (1) is α_3, which represents the estimated

effect that teacher-principal race match has on the likelihood teachers depart their school. Based on

theories such as similarity-attraction, self-categorization, and social identity, individuals tend to

gain more utility in a group setting with members of a similar type with regard to demographic

characteristics such as race and ethnicity based on associations with cultural attitudes, beliefs, or

traits (Bednar & Gicheva, 2019; Byrne, 1971; Stangor et al., 1992). Therefore, we hypothesize that

teacher-principal race congruence will be associated with a significantly lower chance that teachers

transfer schools and exit the schooling system. However, it remains unclear whether such benefits

of demographic similarity extend to all teacher subgroups equally or whether the positive effects

experienced from demographic similarity are more salient for racially/ethnically minoritized

teacher groups. To explore this point, we estimate modified forms of equation (1) wherein we

interact $Trace_{jst}$ and $RaceMatch_{jst}$ to test whether teacher-principal race congruence has a

differential effect on the likelihood of turnover for teachers of color.

We similarly explore the extent to which the racial/ethnic composition of peer teachers

within a teacher's school predicts their likelihood of turnover using models expressed as follows:

$$Y_{jst} = \beta_0 + \beta_1 Trace_{jst} + \beta_2 PctSameRace_{jst} + \eta' X_{jst} + \varphi' S_{st} + \lambda_s + \gamma_t + u_{jst}, \qquad (2)$$

where $PctSameRace_{jst}$ represents the percent of teachers within school *s* that are of the same

racial/ethnic background as teacher *j* during time *t*. Here, a significant and negative coefficient of

interest, β_2, would indicate that teachers are less likely to depart their school when there is a larger

share of teachers of the same race or ethnicity. As before, we interact $Trace_{jst}$ and

$PctSameRace_{jst}$ to assess whether the influence of peer teacher demographic composition

significantly differs for particular racial/ethnic subgroups of teachers.

Finally, we use survey-based measures to estimate the predictive relationship between teachers' perception of effective school leadership and positive teacher relationships with teacher turnover using models of the following form:

$$Y_{jst} = \varpi_0 + \varpi_1 Trace_{jst} + \varpi_2 Perception_{st} + \eta' X_{jst} + \varphi' S_{st} + \lambda_s + \gamma_t + u_{jst}. \qquad (3)$$

We estimate equation (3) separately where the term $Perception_{st}$ represents the survey-based measure for either (a) teachers' perception of their principal as an effective school leader or (b) teachers' perception of peer teacher relationships within the school. To the extent that teachers' utility from working in their school is reflected in their perceptions of their principal's leadership style and more positive peer relations, we expect that both factors will be significantly related to the likelihood a teacher departs their school. We also modify equation (3) to interact the perception measure with teacher race/ethnicity to test whether the relationship between effective school leadership practices and positive teacher relationships differentially affect the likelihood teachers of color leave their school.[8]

Results

Before proceeding onto the results from the study's primary analysis, we present descriptive trends in teacher turnover patterns to illustrate the extent to which they differ by teacher race and ethnicity. Each year, the rate of exit was consistently higher than the rate of school transfer, as about 10 percent of all teachers exited from the district while about 5 percent transferred schools. We more closely examine teacher turnover patterns by disaggregating rates based on teacher racial/ethnic subgroup and principal race congruence in Figure 1.[9] Plot (A) captures turnover rates for all teachers in the analytic sample. The subsequent plots differentiate turnover for White, Black, and Hispanic teachers. Notably, the depicted trends in turnover demonstrate that teachers are more likely to remain at their school when their principal is of a similar racial/ethnic background. While about 16 percent of teachers leave their school when their

principal is of a different racial/ethnic background, the average rate of turnover is approximately 4

percentage points lower for teachers in schools led by a principal of a similar race or ethnicity.

[INSERT FIGURE 1 HERE]

However, we find that the pattern in which teachers tend to turnover less when located in schools

with a principal of the same race is confined to Black teachers, as shown in plot (B). In contrast,

post-2013, turnover rates are actually *higher* for Hispanic teachers in schools led by Hispanic

principals—plot (C)—and, to a greater extent, for White teachers in schools led by White

principals—plot (D).

Figure 2 explores descriptive trends in teacher turnover but by teacher racial/ethnic

subgroup and the racial/ethnic composition of peer teachers. Each line represents teacher turnover

rates based on the degree to which the percentage of peer teachers in a school are of the same

race/ethnicity as a teacher. Plot (A) indicates that, overall, teachers leave at lower rates when more

than 75 percent of peer teachers are the same race/ethnicity. However, this pattern varies based on

teacher racial/ethnic background. As shown in plot (B), Black teachers are *more* likely to leave

their school when more than 75 percent of teachers are also Black. To the contrary, Hispanic and

White teachers are less likely to leave their school when more than 75 percent of teachers are the

same race/ethnicity—plots (C) and (D).

[INSERT FIGURE 2 HERE]

Overall, the patterns in Figures 1 and 2 suggest that the demographic compositions of

school leaders and peer teaching staff moderate turnover rates for teachers, but do so differently

for teachers of particular racial/ethnic backgrounds. These descriptive patterns serve as the launch

point for the remainder of the study, which presents results demonstrating estimated associations

between teacher-principal race congruence and teacher turnover after conditioning on the

characteristics of teachers, principals, and the schools in which they work. We then examine

whether an increased presence of peer teachers of the same race predicts lower turnover rates for teachers, and whether such patterns differ for teachers of color. From there, we explore whether reported leadership style and more positive relationships among peer teachers are predictive of turnover rates, specifically for teachers of color.

Principal-Teacher Race Congruence and Teacher Turnover

Table 1 shows the results from multivariate regression models estimating the probability a teacher transfers schools within or exits from the public schooling system by the following year. We first present estimates predicting transfer and exit with school characteristics excluded as model covariates in columns (1) and (5), respectively. As shown, both Black and Hispanic teachers are 1 to 1.5 percentage points more likely to transfer schools but are interestingly 0.3 to 1.5 *less* likely to exit the schooling system than White teachers (p<0.05). Regarding differences in turnover based on principal race, results indicate that teachers are 2.3 percentage points more likely to transfer when working in a school led by a Black principal and 2.1 percentage points more likely to transfer when working in a school led by a Hispanic principal compared to the likelihood of transferring when working in a school with a White principal (p<0.001). Similarly, the likelihood that teachers exit from the public school system are approximately one percentage point higher when working in a school with a Black or Hispanic principal as well.

Many of these differences in teacher transfer patterns are explained by systematic differences across school environments in which teachers and principals of color tend to work. Columns (2) and (6) display corresponding estimates from models that include both controls for observable time variant school characteristics as well as school fixed effects adjusting for fixed school characteristics. Upon controlling for school-related factors, the estimated difference in the probability of transferring schools between Black and White teachers is no longer statistically significant. Hispanic teachers, however, are more likely to transfer than White teachers by 0.3

percentage points after controlling for school characteristics (p<0.05). Furthermore, teachers are 0.9 percentage points more likely to transfer when working in a school led by a Black principal even after adjusting for fixed and observable time-varying school characteristics (p<0.05).

[INSERT TABLE 1 HERE]

The remaining estimates displayed in Table 1 test for differences in transfer and exit patterns among teachers with a principal of the same racial/ethnic background. Across models, the estimated coefficients show consistent evidence that race congruence between teachers and principals is predictive of lower likelihood of transfer and exit. Columns (3) and (7) first show estimates modeling for differences in teacher turnover based on teacher-principal race congruence for all racial/ethnic subgroups combined. According to model estimates, teachers paired with a principal of the same race or ethnicity are 0.5 percentage points less likely to transfer schools and 0.5 percentage points less likely to exit the schooling system (p<0.001), which translates to about a 10 and 5 percent reduction of baseline transfer and exit rates, respectively. When disaggregated by racial/ethnic subgroup—columns (4) and (8)—estimates suggest that the reduced likelihood of transfer associated with teacher-principal race congruence is seemingly concentrated among Black teachers only, as on average the probability that a Black teacher transfers from their school is one percentage point lower when in a school led by a Black principal compared to when they are paired with a principal of a different racial/ethnic background (p<0.01). However, the reduced probability of transfer associated with Black teacher-principal race-match only offsets the predicted 1.1 percentage point increase in transfer associated with teachers teaching in a school led by a Black principal. Conversely, the differential likelihood of exiting the schooling system based on principal-teacher race congruence does not differ across racial/ethnic subgroups.

Demographic Composition of Peer Teachers and Teacher Turnover

Table 2 presents model estimates of the relationship between the racial/ethnic composition of peer teachers within a school and the likelihood of turnover. Columns (1) and (3) present estimates from equation (2) predicting teacher turnover and exit, respectively, from models that condition on observable teacher, principal, and school characteristics. The coefficients on teacher race/ethnicity suggest that Black and Hispanic teachers are significantly *less* likely to turnover and exit compared to their White teacher counterparts when controlling for differences in school characteristics. Notably, the racial/ethnic composition of teaching staff within a school appears to be particularly predictive of the likelihood a teacher transfers within or exits from the schooling system when considered in relation to (as opposed to irrespective of) a teacher's race or ethnicity. In other words, the likelihood a teacher departs from their school is not significantly related to the overall racial/ethnic composition of their school's teaching staff after adjusting for the percentage of same-race teachers in the school; however, the percentage of teachers who are of a similar racial or ethnic background is in and of itself predictive of the likelihood a teacher turns over. The coefficient on percentage of same-race teachers is statistically significant and negative, suggesting that the probability a teacher transfers schools or exits the system is 2.3 and 2.6 percentage points lower, respectively ($p<0.001$) for each percentage point increase in the share of teachers of the same racial/ethnic background within their school.

<center>[INSERT TABLE 2 HERE]</center>

Columns (2) and (4) present estimates for the modified form of equation (2), which interacts the percentage of same-race teachers in a school with a teacher's race/ethnicity. As shown, the predicted relationship between a one-percentage point increase in the same-race teacher composition within a teacher's school and the probability that a teacher transfers is significantly larger for Black teachers (3.5 percentage points; $p<0.001$). In contrast, the interaction terms are not significant when predicting the probability of exiting the system, suggesting that an increased

proportion of teachers of the same race does not differentially predict the probability that teachers of color exit the public school system entirely. In other words, model estimates provide suggestive evidence that the racial composition of peer teaching staff predicts the likelihood of exit uniformly for both White teachers and teachers of color.

School Leadership Style, Teacher Relationships, and Teacher Turnover

Next, we leverage the survey-based measures of school leadership and teacher relationships to predict teacher turnover. Table 3 shows the results of models that include the constructed factor measuring the extent to which a principal demonstrates effective school leadership. Estimates from baseline models presented in columns (1) and (3) consistently indicate that effective school leadership is significantly associated with lower teacher turnover. We find that, on average, a 1-SD increase in the effective school leadership measure is associated with a decrease in probability of transferring schools by 1.2 percentage points (p<0.001) and a decrease in probability of exiting the school system by 0.5 percentage points (p<0.001). Furthermore, results from the interacted model presented in column (2) reveals that the relationship between effective school leadership and likelihood of turnover does not differ systematically among teachers of color, as the interaction terms are not statistically significant at conventional levels.

[INSERT TABLE 3 HERE]

We next model the relationship between the teacher relationships measure and teacher turnover. Table 4 displays the results of models that include the aggregated survey item representing the percent of teachers who agree that teachers within the school trust one another. As shown in the baseline models presented in columns (1) and (3), a higher proportion of teachers who report positive teacher relationships within their school is associated with a decrease in probability of school transfer by 0.6 percentage point (p<0.001) and a decrease in probability of exiting the school system by 0.4 percentage points (p<0.001). When disaggregated, estimates from

the modified interacted model indicate that the predictive relationship between more positive

teacher relationships and teacher transfer is significantly weaker for Black teachers (by 0.3

percentage points) but not significantly different for other teachers of color—column (2).

Similarly, the relationship between more positive teacher relationships within the school and the

probability of exiting the system is attenuated for Hispanic teachers—column (4). While a 1-SD

increase in teachers who agree that teachers trust one another in their school is generally associated

with a 0.5 percentage point decline in exit ($p<0.001$), the predicted likelihood of exiting is only 0.1

percentage points lower for Hispanic teachers ($p<0.05$).

[INSERT TABLE 4 HERE]

Discussion

Our findings augment the extensive body of research documenting the contributors of

teacher turnover and do so by specifically focusing on turnover disparities for teachers of color.

Based on data of public school teachers in NYC, our analyses suggest that, while transfer rates are

higher among teachers of color, the disparity is largely explained by school-level characteristics.

Further, the predicted likelihood teachers of color exit the schooling system entirely is lower than

White teachers after adjusting for differences in fixed and observable time-varying school

characteristics, which runs in contrast to evidence found in prior studies (e.g., Kohli, 2018), likely

due to what may be a comparably less hostile racial climate in NYC schools compared to other

public school systems throughout the United States. However, these results add nuance to findings

from prior research documenting that teachers of color are noticeably more likely to work in

schools that are under-resourced and have higher turnover rates but, despite being more likely to

move schools, tend to leave the workforce at similar rates to White teachers (Achinsten et al.,

2010; Sutcher et al., 2016).

Importantly, our findings shed light on the degree to which a school staff's demographics might affect teacher turnover decisions and affirm turnover patterns hypothesized by prevailing theories such as similarity-attraction and social isolation. According to model estimates, a teacher is about 5 to 10 percentage points less likely to transfer to a new school or exit the schooling system when teaching in a school led by a principal of the same race/ethnicity. Similarly, even after controlling for the student demographic composition within a school, teachers are less likely to leave their school if a larger share of their teacher colleagues are of the same race/ethnicity— this predicted difference in school transfer especially applies to Black teachers. This finding supports prior survey evidence of teacher racial sorting wherein teachers of color tend to remain teaching in schools with a larger share of colleagues of similar racial/ethnic backgrounds (Frankenberg, 2009), and simultaneously adds nuance to emerging qualitative research by providing robust evidence that "groupers" are less likely to leave their school (Bristol, 2020). Moreover, the concentrated effects of demographic similarity with Black teacher peers observed on Black teacher turnover may be suggestive of the salience of similarity attraction and social isolation for Black teachers, likely due to an implicit desire to evade and buttress against instances of anti-blackness in school work environments. Lastly, while more effective school leadership styles and more positive teacher relationships predict a lower likelihood of turnover for the average teacher, effective school leadership appears to more prominently predict teacher turnover but does not do so differently for teachers of color.

Implications for Education Policy and Practice

A long tradition of theoretical research has posited that shared demographic background is associated with increased cohesion and positive outcomes for organizations and its employees (e.g., Bednar & Gicheva, 2019; Byrne, 1971). Our findings lend support for the applicability of these theories to K–12 teachers and schools while adding a layer of complexity to suggest that they

may apply unevenly to specific subgroups of teachers. The K–12 public school system finds itself with a problem requiring a set of solutions that include the diversification of the pipeline for teachers and school leaders as well as more transparent and culturally responsive hiring and leadership practices in schools.

Educators of color are severely underrepresented within the field of education. National estimates suggest that while Black students comprised about 15 percent of the student population in public schools during the 2017–18 academic year, only about 7 percent of teachers and 11 percent of principals were Black in that same year, with even worse representation gaps arising among Hispanics (U.S. Department of Education, National Center for Education Statistics, 2020). The underrepresentation of both teachers and principals of color remains an intertwined and persistent educational challenge that education policymakers and administrators should continue to address.

The challenge for researchers and policymakers is to develop effective ways to diversify the pipeline of school educators and leaders. The demographics of school leadership matter for retention of teachers of color, so, to that end, a promising start to building and sustaining a racial and ethnically diverse teaching workforce would be to specifically bolster initiatives to diversify the principal pipeline. Prioritizing the development of school leaders of color may involve a mix of recruitment and mentoring strategies to reduce barriers of entry into the principalship and create conditions conducive for successful retention. Such strategies may include partnering with local higher education institutions and teacher preparation programs to identify and recruit promising teachers of color into school building leader programs; offering scholarships, loan forgiveness, and paid apprenticeships to students who complete school leader preparation; and creating formalized systems of professional support for aspiring school leaders with philosophies that center the importance of race and cultural inclusion to student learning (Stanley, 2021). Notwithstanding the

forgoing, our study revealed an increased likelihood of teacher transfer associated with Black

principals, which was not entirely related to differences in observable and time-invariant school

characteristics; thus, enhancing diversity of the principalship will require that policymakers and

practitioners contend with the underlying drivers of differences in teacher turnover associated with

principals of color and warrants future research on the matter.

Beyond school leadership, the demographics of peer teaching staff matter for the retention

of teachers of color as well. It can be argued that a cause of high turnover rates often includes a

lack of effective hiring practices (Abbasi & Hollman, 2000). To the extent that district leaders and

school principals espouse the mindset that successful recruitment and retention of teachers of color

are continuous processes, a marginal, one-time hiring of teachers of color may prove to be an

unsuccessful long-term strategy to sustain a diverse teaching workforce. In accordance with best

practices for fostering a culture of inclusion within the workplace, deliberate and transparent hiring

and communication strategies may prove crucial to the retention of minoritized staff as they

provide reassurance of a school's hiring goals and whether they are concretely moving toward an

inclusive and diverse group of personnel (Ferdman, 2013; Scott-Baumann, 2019).

While education policymakers and practitioners increasingly (and rightfully) devote

increased attention to how schools espouse culturally responsive pedagogy and curricula for

students (Acosta, 2018), we argue that less attention is devoted to promoting culturally responsive

supervision of teaching staff and extending a culture of inclusion among peer teachers, practices

that may help attract and maintain a racially diverse teaching staff. In accordance with

recommendations made by the modest literature on culturally responsive leadership and

management in education and other professional settings (e.g., Griffin et al., 2016; Johnson, 2006;

Khalifa et al., 2016), school leaders should play a leading role in maintaining cultural

responsiveness in their schools by articulating a school vision that centers inclusivity for both

teachers and students (Acosta, 2018); recruiting, developing, and retaining teachers that share in

that vision (Stanley, 2021); and facilitating critical professional development that interrogates the

assumptions about race and culture and their effect on both teachers and students within their

classrooms (Kohli et al., 2021; Lisle-Johnson & Kohli, 2020)—and, by extension, education

leadership programs and district education agencies should also work to strengthen pre-service and

in-service school leaders' capacities in these areas (White et al., 2020). Several scholars provide

further recommendations to bolster a diverse teacher workforce in schools that involve school

leaders and teachers collectively examining and revising policies and practices that obstruct the

hiring and retention of a diverse teaching staff, supporting and respecting teacher supportive

communities of practice, and continually acknowledging and dismantling in-group and out-group

divides in professional settings (Andrews et al., 2019; Farinde-Wu et al., 2020; Stanley, 2021).

Implications for Education Research

We note that while school characteristics explain turnover disparities for teachers of color,

there nevertheless remains a lack of understanding of what dimensions of school leadership and

teacher relationships contribute to those disparities. Current and standard survey-based methods

for measuring perceptions of school leadership and teacher relationships arguably do not capture

their nuanced racialized aspects. Researchers should continue to explore and define aspects of

school leadership and teacher relationships that are particularly salient for supporting the inclusion

and retention of teachers of color in schools, especially in contexts where they may be

underrepresented. Advancing our understanding in this area as well as developing suitable metrics

capable of measuring the complexities of school leadership and teacher relationships will be vital

to enhance school leaders' ability to establish and maintain a school environment conducive to

cohesion, collaboration, and inclusivity among diverse staff.

Finally, while the theories described and applied herein are among the most commonly used by scholars studying racial disparities in employee turnover, it is important to note that they do not holistically consider the complexities of race and ethnicity and the effects thereof on interpersonal dynamics within workplace settings. In particular, intersectionality, or the concept of interconnected social identities, remains out of scope of the current study. Future research should further explore the intersectional manner by which staff demographics, perceptions, and interactions affect turnover among teachers of marginalized and underrepresented demographic backgrounds and identities. Furthermore, we argue that the study of teacher turnover is a field that is ripe for the development and application of more critical theories surrounding issues of race, power, and privilege among and between teachers and school leaders. Theoretical advancements and applications in this area could support a more granular understanding of the interpersonal, micro-interactions and the systems of power and privilege they serve to maintain among school staff. More critical insights on the matter could aid researchers in exploring additional solutions and practices to undo behaviors and dismantle systems that thwart the recruitment and retention of a diverse teaching workforce.

At present, firm and consistent evidence suggest that the underrepresentation of educators of color presents dire consequences to the maintenance of the many educational inequities experienced by students of color. Understanding and altering the factors that perpetuate the systemic underrepresentation of teachers of color is thus vital to redress such educational inequities. Taken altogether, the current study along with prior research presents convincing evidence that the demographics of a school's leadership and teaching staff are but one of the many school-related factors that contribute to teacher turnover decisions and do so in nuanced ways that exacerbate the departure of teachers of color from schools and the profession. Just as racial and ethnic representation have profound effects on students of all racial/ethnic backgrounds, they also

have profound impact on the workforce behaviors of teachers themselves. Recognizing the layered

effects that representation has among both teachers and students thus provides renewed and

strengthened reason for the continued diversification of the public school workforce tasked with

serving and educating an increasingly diversifying student population.

Notes

1   Unless otherwise noted, we use the term "teachers of color" to refer to all individuals who are

    not White-identifying. We apply a similar definition when referring to "principals of color,"

    "people of color," or any similar variant.

2   We use the term "Hispanic" in lieu of "Latino/a" or the gender-neutral equivalent "Latinx."

    While we recognize the distinction between the term Hispanic, used to denote Spanish-

    speaking descent, and the terms Latino/a and Latinx, used to denote Latin American origin or

    ancestry, our preference for the term Hispanic stems from its use in the cited literature as well

    as the racial/ethnic categories defined in the administrative and survey data sources used for

    the analysis presented in this study.

3   In NYC, the setting under study, Black and Hispanic teachers tend to have more years of

    teaching experience but lower rates of attainment of Master's or more advanced degrees

    compared to White teachers (see Table 1).

4   We restrict our analytic sample to teachers in "regular" school districts in NYC, which include

    32 community districts across the five regional boroughs.

5   Across all 12,816 school-years, 1,754 unique schools appear in the NYC DOE administrative

    data, 2.58 percent of which were associated with two active principals in a given year. We

    selected one principal at random to serve as the primary principal for our analysis. The

    magnitude and significance of results presented remain robust to sensitivity checks in which

    the alternate principal was selected.

6   We estimate all our models using logistic regression and find the results are qualitatively

similar with respect to magnitude, direction, and statistical significance of marginal effects. We

thus chose to utilize LPM as our preferred modeling approach for the sake of interpretability.

Results for all analyses estimated using logistic regression are available upon request from the

authors.

7   The analyses presented throughout this study distinguish between different racial/ethnic groups

as reflected in available administrative data. Due to small numbers of individuals belonging to

specific racial/ethnic origin categories, we collapse Asian, Pacific Islander, Native American,

Alaskan Native as well as people of two or more races or whose racial/ethnic identity remains

unidentifiable in the data to represent them within the group labeled as extremely

underrepresented background (EUB). This decision is by no means intended to erase the

diverse and individualized experiences of racial/ethnic subgroups and persons or to avoid the

complexities of racial identity, but reflects the limitations presented by statistical analysis with

small subgroup samples.

8   As an auxiliary analysis (presented in Appendix B), we regress teacher turnover on both

measures of school leadership and peer teacher relationships simultaneously, but within

separate subsamples defined by teacher race/ethnicity.

9   For the sake of concision, Figures 1 and 2 present overall turnover rates encompassing both

school transfers and system exits; all regression analyses distinguish between both forms of

turnover.

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Figure 1. Teacher Turnover Over Time By Teacher Racial/Ethnic Subgroup and Principal Race Congruence
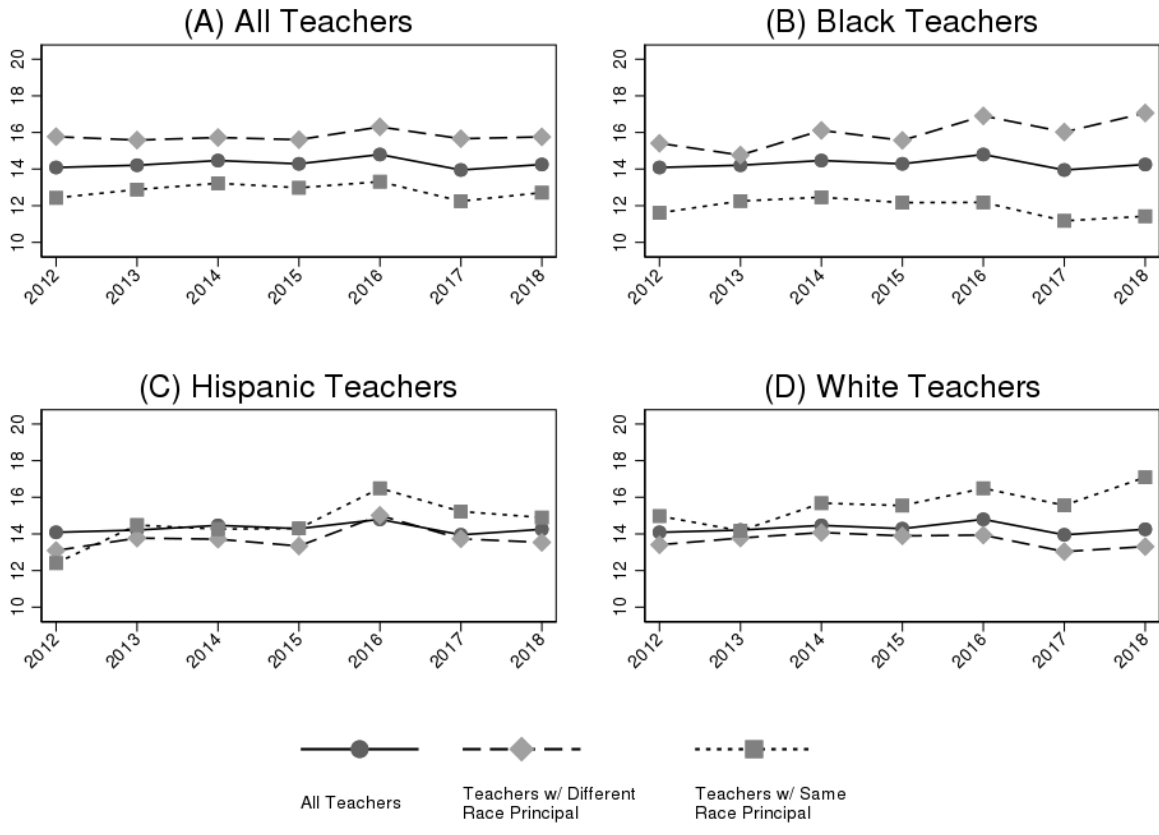
Figure 2. Teacher Turnover Over Time By Teacher Racial/Ethnic Subgroup and Racial/Ethnic Composition of Peer Teachers
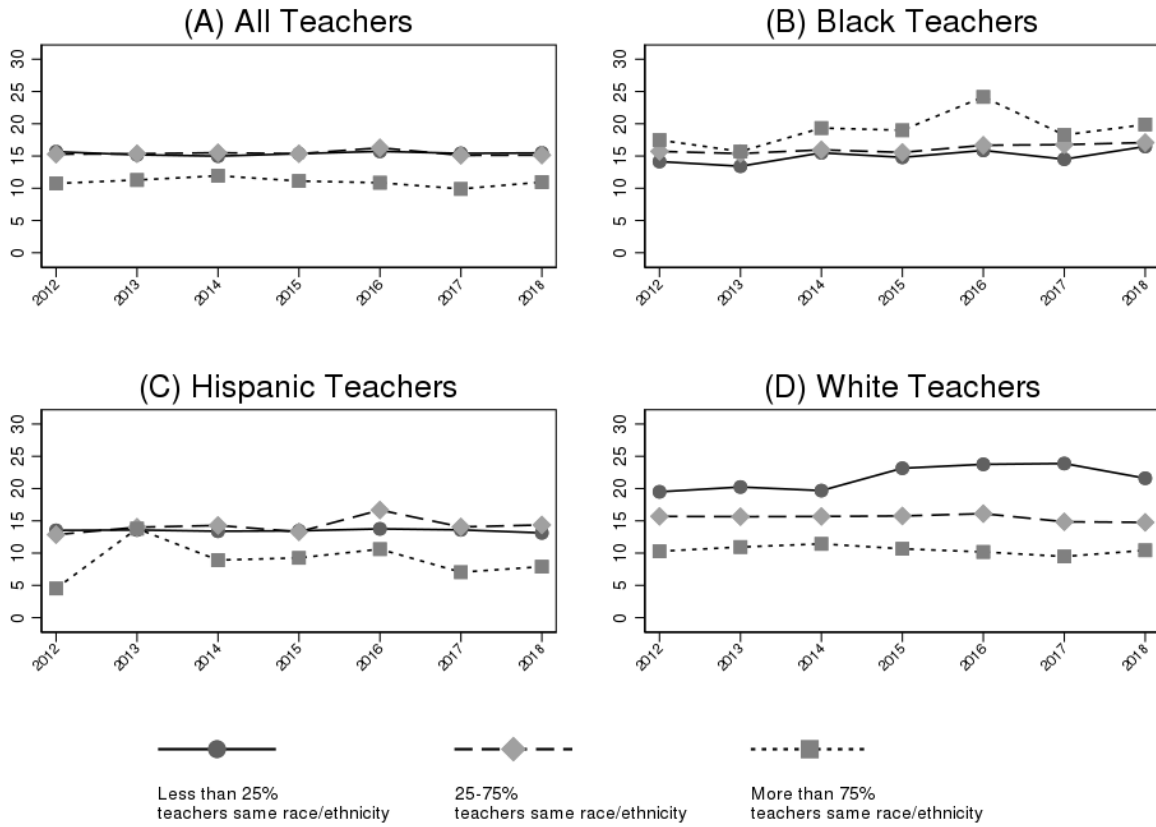
Table 1. Regression estimates predicting teacher turnover and relationship with teacher race, principal race, and teacher-principal race congruence

	Transfer within NYC Schools				Exit from NYC Schools			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Teacher race/ethnicity [BASE=White]								
Black	0.015***	-0.002	-0.003*	0.001	-0.003*	-0.016***	-0.016***	-0.017***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Hispanic	0.010***	0.003*	0.001	0.002	-0.015***	-0.022***	-0.023***	-0.026***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
EUB	0.004***	0.000	-0.002	-0.001	0.001	-0.002	-0.004*	-0.006**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Principal race/ethnicity [BASE=White]								
Black	0.023***	0.009*	0.007	0.011*	0.011***	-0.001	-0.002	-0.003
	(0.001)	(0.004)	(0.004)	(0.004)	(0.001)	(0.004)	(0.004)	(0.004)
Hispanic	0.021***	0.006	0.004	0.004	0.013***	0.006	0.004	0.002
	(0.001)	(0.004)	(0.004)	(0.005)	(0.001)	(0.004)	(0.004)	(0.004)
EUB	0.010***	0.012	0.009	0.011	0.006**	-0.008	-0.010	-0.013*
	(0.002)	(0.007)	(0.007)	(0.007)	(0.002)	(0.006)	(0.006)	(0.006)
Race congruence [BASE=Different]								
Same			-0.005***	-0.002			-0.005***	-0.007**
			(0.001)	(0.002)			(0.001)	(0.002)
Same x Black teacher				-0.010**				0.002
				(0.004)				(0.004)
Same x Hispanic teacher				0.000				0.007
				(0.004)				(0.005)
Same x Teacher from an EUB				-0.001				0.014
				(0.005)				(0.008)
Constant	0.085***	0.069***	0.073***	0.070***	0.126***	0.148***	0.152***	0.154***
	(0.003)	(0.020)	(0.020)	(0.020)	(0.003)	(0.024)	(0.024)	(0.025)
School controls		X	X	X		X	X	X
School fixed effects		X	X	X		X	X	X
Year fixed effects	X	X	X	X	X	X	X	X
Obs. (teacher-year)	455,975	455,975	455,975	455,975	455,975	455,975	455,975	455,975

Notes. Robust standard errors reported in parentheses. "EUB" = "Extremely Underrepresented Background" includes individuals who identify as Asian, Pacific Islander, Native American, Alaskan Native as well as individuals of two or more races or whose racial/ethnic identity remains unidentifiable in the administrative data. All models include vectors of mean-centered individual teacher characteristics, principal characteristics. Models 2, 3, 5, and 6 also include mean-centered school-level averaged teacher characteristics and other time-varying school characteristics. Individual and averaged teacher characteristics not shown include covariates for teacher gender, race, experience, highest degree attained, age, and salary; principal characteristics not shown include covariates for principal gender and experience; other time-varying school-level characteristics include covariates for student enrollment (logged), pupil-teacher ratio, and average student gender, race, free/reduced-price lunch status, special education status, limited English proficiency status, attendance rate, and a survey-based measure of school behavioral climate.
* p<0.05; ** p<0.01; *** p<0.001.

Table 2. Regression estimates predicting teacher turnover and relationship with teacher race and composition of same-race teachers

	Transfer within NYC Schools		Exit from NYC Schools	
	(1)	(2)	(3)	(4)
Teacher race/ethnicity [BASE=White]				
Black	-0.008***	-0.012***	-0.022***	-0.020***
	(0.001)	(0.002)	(0.002)	(0.002)
Hispanic	-0.006***	-0.002	-0.031***	-0.029***
	(0.001)	(0.003)	(0.002)	(0.003)
EUB	-0.011***	-0.012*	-0.015***	-0.024***
	(0.002)	(0.005)	(0.002)	(0.006)
Percent teachers who are Black	-0.007	0.006	-0.014	-0.021
	(0.022)	(0.022)	(0.017)	(0.018)
Percent teachers who are Hispanic	0.027	0.030	-0.023	-0.019
	(0.027)	(0.028)	(0.020)	(0.020)
Percent teachers who are from an EUB	-0.047	-0.041	0.010	0.009
	(0.026)	(0.026)	(0.019)	(0.020)
Percentage same-race teachers	-0.023***	-0.011*	-0.026***	-0.034***
	(0.002)	(0.005)	(0.003)	(0.006)
Percentage same-race teachers x Black teacher		-0.035***		0.019
		(0.010)		(0.011)
Percentage same-race teachers x Hispanic teacher		-0.002		0.018
		(0.011)		(0.014)
Percentage same-race teachers x Teacher from an EUB		-0.015		-0.013
		(0.015)		(0.017)
Constant	0.072***	0.071***	0.153***	0.154***
	(0.020)	(0.020)	(0.024)	(0.024)
School fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Obs. (teacher-year)	455,975	455,975	455,975	455,975

Notes. Robust standard errors reported in parentheses. "EUB" = "Extremely Underrepresented Background" includes individuals who identify as Asian, Pacific Islander, Native American, Alaskan Native as well as individuals of two or more races or whose racial/ethnic identity remains unidentifiable in the administrative data. All models include vectors of mean-centered individual and time-varying average teacher characteristics at the school level, principal characteristics, and other time-varying school characteristics. Individual and averaged teacher characteristics not shown include covariates for teacher gender, race, experience, highest degree attained, age, and salary; principal characteristics not shown include covariates for principal gender and experience; other time-varying school-level characteristics include covariates for student enrollment (logged), pupil-teacher ratio, and average student gender, race, free/reduced-price lunch status, special education status, limited English proficiency status, attendance rate, and a survey-based measure of school behavioral climate.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

Table 3. Regression estimates predicting teacher turnover and relationship with effective school leadership

	Transfer within NYC Schools		Exit from NYC Schools	
	(1)	(2)	(3)	(4)
Teacher race/ethnicity [BASE=White]				
Black	-0.002	-0.002	-0.016***	-0.016***
	(0.001)	(0.001)	(0.002)	(0.002)
Hispanic	0.003*	0.003*	-0.022***	-0.022***
	(0.001)	(0.001)	(0.001)	(0.001)
EUB	0.001	0.001	-0.002	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)
Effective school leadership	-0.012***	-0.012***	-0.005***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Effective school leadership x Black teacher		0.001		-0.001
		(0.001)		(0.002)
Effective school leadership x Hispanic teacher		0.001		0.002
		(0.001)		(0.001)
Effective school leadership x Teacher from an EUB		-0.002		-0.002
		(0.001)		(0.002)
Constant	0.055***	0.055***	0.143***	0.143***
	(0.011)	(0.011)	(0.026)	(0.026)
School fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Obs. (teacher-year)	453,296	453,296	453,296	453,296

Notes. Robust standard errors reported in parentheses. "EUB" = "Extremely Underrepresented Background" includes individuals who identify as Asian, Pacific Islander, Native American, Alaskan Native as well as individuals of two or more races or whose racial/ethnic identity remains unidentifiable in the administrative data. All models include vectors of mean-centered individual and time-varying average teacher characteristics at the school level, principal characteristics, and other time-varying school characteristics. Individual and averaged teacher characteristics not shown include covariates for teacher gender, race, experience, highest degree attained, age, and salary; principal characteristics not shown include covariates for principal gender and experience; other time-varying school-level characteristics include covariates for student enrollment (logged), pupil-teacher ratio, and average student gender, race, free/reduced-price lunch status, special education status, limited English proficiency status, attendance rate, and a survey-based measure of school behavioral climate.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

Table 4. Regression estimates predicting teacher turnover and relationship with peer teacher relationships

	Transfer within NYC Schools		Exit from NYC Schools	
	(1)	(2)	(3)	(4)
Teacher race/ethnicity [BASE=White]				
Black	-0.002	-0.002	-0.016***	-0.016***
	(0.001)	(0.001)	(0.002)	(0.002)
Hispanic	0.003*	0.003*	-0.022***	-0.022***
	(0.001)	(0.001)	(0.001)	(0.001)
EUB	0.001	0.001	-0.002	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)
Teacher relationships	-0.006***	-0.007***	-0.004***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Teacher relationships x Black teacher		0.003*		0.002
		(0.002)		(0.002)
Teacher relationships x Hispanic teacher		0.002		0.004*
		(0.002)		(0.002)
Teacher relationships x Teacher from an EUB		-0.001		-0.001
		(0.002)		(0.002)
Constant	0.054***	0.054***	0.142***	0.142***
	(0.013)	(0.013)	(0.027)	(0.027)
School fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Obs. (teacher-year)	453,296	453,296	453,296	453,296

Notes. Robust standard errors reported in parentheses. "EUB" = "Extremely Underrepresented Background" includes individuals who identify as Asian, Pacific Islander, Native American, Alaskan Native as well as individuals of two or more races or whose racial/ethnic identity remains unidentifiable in the administrative data. All models include vectors of mean-centered individual and time-varying average teacher characteristics at the school level, principal characteristics, and other time-varying school characteristics. Individual and averaged teacher characteristics not shown include covariates for teacher gender, race, experience, highest degree attained, age, and salary; principal characteristics not shown include covariates for principal gender and experience; other time-varying school-level characteristics include covariates for student enrollment (logged), pupil-teacher ratio, and average student gender, race, free/reduced-price lunch status, special education status, limited English proficiency status, attendance rate, and a survey-based measure of school behavioral climate.
* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

Appendix A

Supplementary Figures and Tables

Figure A.1. Probability Density Function of School Context Measures
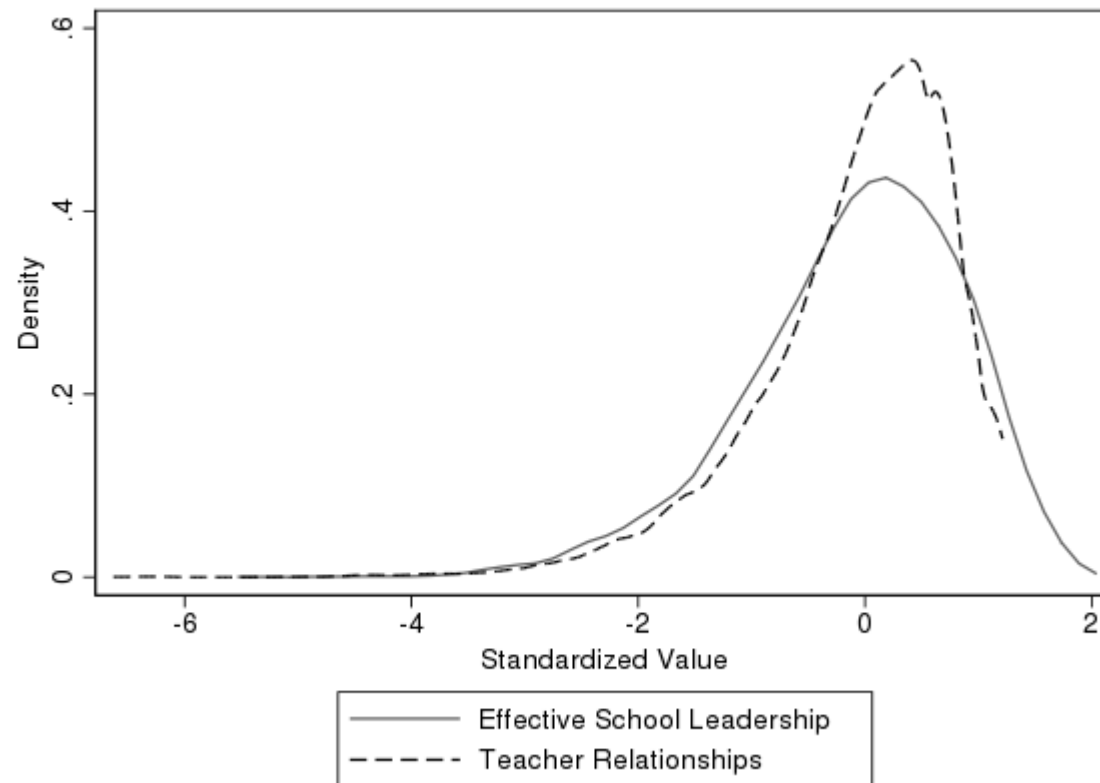
Notes. Graph displays probability density functions of standardized measures of "Effective School Leadership" and percent of teachers who agree that teachers in their school trust each other (i.e., "Teacher Relationships") in a school-by-year data set (n = 11,238). The underlying unit of measurement is based on teachers' responses to the NYC School Survey on a Likert scale.

Figure A.2. Correlations Between School Context Measures and School Characteristics
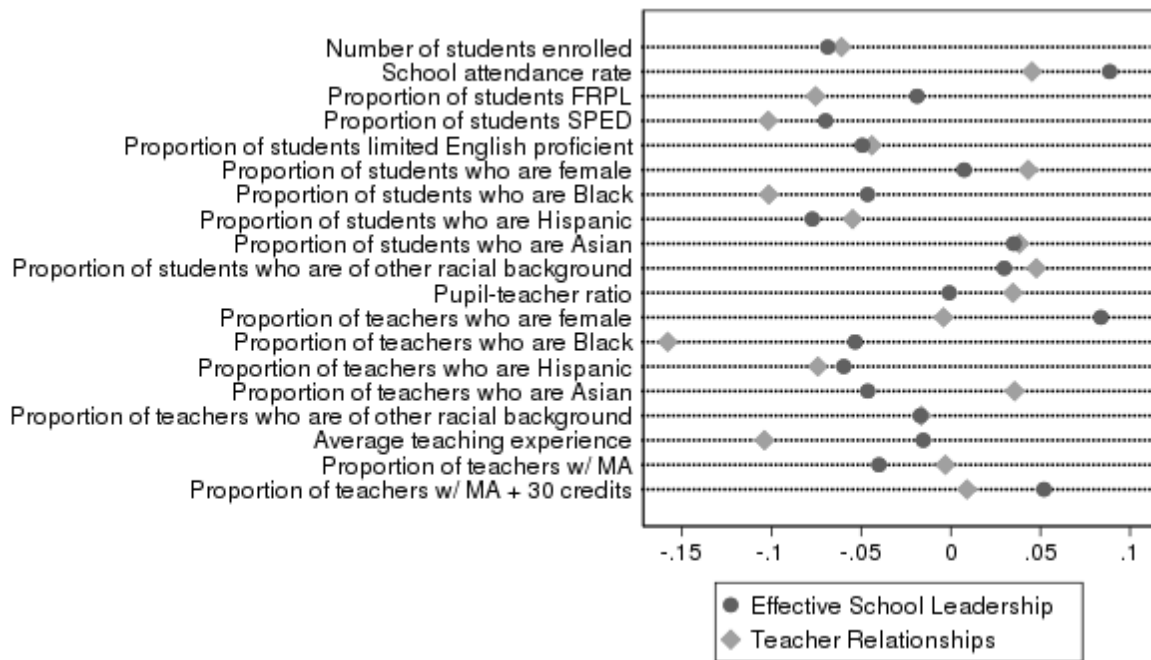
Notes. Graph displays correlation values between school characteristics and unstandardized measure of "Effective School Leadership" as well as school characteristics and percent of teachers who agree that teachers in their school trust each other (i.e., "Teacher Relationships") in a school-by-year dataset (n = 11,238).

Table A.1. Teacher response rates to the New York City Department of Education School Survey

Year	*n*	Average	25th Percentile	75th Percentile
2012	61,980	83	77	97
2013	62,785	83	77	97
2014	63,857	82	74	97
2015	65,361	81	74	98
2016	66,480	82	75	97
2017	67,424	83	77	97
2018	68,088	83	76	97

Notes. "Average" is the overall response rate for the indicated year. "Percentiles" indicate school-level response rates for schools at the 25th and 75th percentile of the school response rate distribution.

Table A.2. Sample means of teacher characteristics, overall and by teacher race/ethnicity

| | All | Teacher Racial/Ethnic Subgroup | | | | |
		White	Black	Hispanic	Asian	PI/NA/AN/M/U
Race/ethnicity						
White	58.56	–	–	–	–	–
Black	17.28	–	–	–	–	–
Hispanic	14.53	–	–	–	–	–
Asian	6.27	–	–	–	–	–
PI/NA/AN/M/U	3.37	–	–	–	–	–
Female	77.78	76.82	80.14	79.53	76.73	76.92
Teaching experience						
Less than 2 years	7.46	7.36	5.33	5.65	9.92	23.32
2–3 years	11.41	11.21	7.92	10.82	14.25	30.05
4–10 years	32.03	33.40	26.05	30.89	35.92	36.48
11–20 years	36.37	35.72	44.75	38.47	31.83	4.18
More than 20 years	12.74	12.32	15.95	14.17	8.08	5.97
Highest level of education						
Bachelor's degree	7.32	6.52	8.28	8.25	8.10	11.11
Master's degree	10.30	9.15	9.28	12.12	11.89	25.28
Master's degree plus 30 credits	82.38	84.33	82.44	79.63	80.01	63.61
Age	41.99	41.44	45.65	42.36	40.15	34.46
Salary ($)	71,637	71,576	74,677	72,067	69,423	58,851
Principal of same race/ethnicity	50.21	62.31	50.11	29.84	8.62	5.37
Teacher-year obs.	455,975	267,028	78,775	66,241	28,573	15,358
Unique teachers obs.	100,076	58,310	16,941	13,319	6,548	4,958

Notes. Based on authors' calculations using New York City Department of Education administrative data between the 2011–12 to 2017–18 academic years. "PI" = Pacific Islander; "NA" = Native American; "AN" = Alaskan Native; "M" = Multiracial; "U" = Unidentifiable racial/ethnic background. See table A.2 for teacher-level sample means of the full set of available school characteristics.

Table A.3. Teacher-level sample means of school characteristics, overall and by teacher race/ethnicity

	All	White	Black	Hispanic	Asian	PI/NA/AN/M/U
Principal Characteristics						
Principal is Black	22.73	15.54	50.11	21.15	18.79	21.64
Principal is Hispanic	16.71	14.54	13.21	29.84	14.53	19.66
Principal is Asian	3.07	2.90	1.81	2.75	8.62	3.54
Principal is PI/NA/AN/M/U	5.02	4.71	5.58	5.00	6.14	5.37
Principal is female	66.92	66.49	67.70	68.21	65.65	67.06
Principal has less than 2 years experience	8.65	8.37	9.47	9.12	8.08	8.35
Principal has 2–3 years experience	16.89	16.47	17.80	17.73	16.20	17.11
Principal has 4–10 years experience	46.86	47.84	44.85	45.65	45.70	47.55
Principal has 11–20 years experience	20.83	20.74	21.14	20.97	21.01	19.72
Principal has more than 20 years	6.77	6.58	6.74	6.53	9.01	7.27
School-Level Teacher Characteristics						
Share of teachers who are Black	0.17	0.12	0.38	0.16	0.14	0.17
Share of teachers who are Hispanic	0.15	0.12	0.14	0.26	0.13	0.16
Share of teachers who are Asian	0.06	0.06	0.05	0.05	0.14	0.06
Share of teachers who are PI/NA/AN/M/U	0.03	0.03	0.03	0.04	0.03	0.07
Share of teachers who are female	0.78	0.79	0.76	0.78	0.75	0.76
Average teacher experience	10.87	10.89	11.26	10.72	10.57	9.89
Share of teachers with Master's/more advanced degree	0.93	0.93	0.92	0.92	0.93	0.92
School-Level Student Characteristics						
Share of students who are Black	0.08	0.07	0.16	0.07	0.07	0.08
Share of students who are Hispanic	0.14	0.13	0.12	0.19	0.12	0.15
Share of students who are Asian	0.05	0.06	0.02	0.03	0.09	0.05
Share of students who are PI/NA/AN/M/U	0.01	0.01	0.01	0.00	0.01	0.01
Share of students eligible for free or reduced-price lunch	0.82	0.80	0.86	0.86	0.81	0.83
Share of students receiving special education services	0.18	0.18	0.20	0.19	0.16	0.19
Share of students with limited English proficiency	0.15	0.14	0.12	0.21	0.18	0.17
Other School Characteristics						
Student enrollment	946.23	1019.78	721.93	877.67	1078.85	868.22
Pupil-teacher ratio	15.13	15.32	14.64	14.71	15.99	14.68
Attendance rate	0.91	0.92	0.90	0.91	0.91	0.91
Share teachers who agree:						
"At this school, order/discipline are maintained"	0.78	0.80	0.73	0.77	0.79	0.77
Teacher-year obs.	455,975	267,028	78,775	66,241	28,573	15,358
Unique teachers obs.	100,076	58,310	16,941	13,319	6,548	4,958

Notes. Based on authors' calculations using New York City Department of Education administrative data between the 2011–12 to 2017–18 academic years. "PI" = Pacific Islander; "NA" = Native American; "AN" = Alaskan Native; "M" = Multiracial; "U" = Unidentifiable racial/ethnic background.

Table A.4. School context measures and factor loadings

		Effective School Leadership
Eigenvalue		4.23
Percent of variation explained		84.58
Conceptual Factor	*Survey Item*	
Effective School Leadership	School leaders communicate a clear vision for this school	0.93
	The principal is an effective manager who makes the school run smoothly	0.92
	The principal understands how children learn	0.93
	The principal knows what's going on in my classroom	0.92
	The principal participates in instructional planning with teams of teachers	0.89
Teacher Relationships	Teachers in the school trust each other	–

Notes. Loadings produced using varimax rotation following factor analysis. Resulting factors are orthogonal (pairwise uncorrelated) across teachers within years.

Appendix B

Modeling Link Between School Leadership, Peer Teacher Relationships, and Teacher

Turnover Separately by Teacher Race/Ethnicity

As an auxiliary approach, we estimated models simultaneously predicting the relationship between both measures for effective school leadership and teacher relationships and teacher turnover, but within subsamples defined by teacher racial/ethnic background. As shown in Table B.1, effective leadership significantly predicts a lower likelihood of turnover for teachers across all racial/ethnic groups, with the exception of exits for Hispanic teachers and teachers of extremely underrepresented racial/ethnic backgrounds. We find that, on average, a 1-SD increase in the effective school leadership measure is associated with a decline in teacher transfer rates across all subgroups between 0.9 to 1.2 percentage points. Notably, effective leadership more strongly predicts declines in transfer for Hispanic teachers—column (5). Conversely, more positive peer relationships do not consistently significantly predict declines in teacher turnover when controlling for effective school leadership. White teachers—column (1)—and teachers of an extremely underrepresented racial/ethnic background—column (8)—were the only subgroups to display significant declines in turnover in the presence of more positive teacher relationships.

Table B.1. Regression estimates predicting teacher turnover and relationship with effective school leadership and peer teacher relationships, by teacher race/ethnicity

Teacher Race/Ethnicity:	White		Black		Hispanic		EUB	
	Transfer	Exit	Transfer	Exit	Transfer	Exit	Transfer	Exit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Effective school leadership	-0.010***	-0.004**	-0.009**	-0.006*	-0.012***	-0.001	-0.009**	-0.004
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Teacher relationships	-0.003*	-0.002	-0.004	-0.002	-0.001	-0.002	-0.002	-0.008*
	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
Constant	0.048***	0.099***	0.020	0.086	-0.015	0.058	0.060	0.220***
	(0.013)	(0.029)	(0.030)	(0.044)	(0.022)	(0.050)	(0.037)	(0.035)
School fixed effects	X	X	X	X	X	X	X	X
Year fixed effects	X	X	X	X	X	X	X	X
Obs. (teacher-year)	265,373	265,373	78,338	78,338	65,954	65,954	43,631	43,631

Notes. Robust standard errors reported in parentheses. "EUB" = "Extremely Underrepresented Background" includes individuals who identify as Asian, Pacific Islander, Native American, Alaskan Native as well as individuals of two or more races or whose racial/ethnic identity remains unidentifiable in the administrative data. All models include vectors of mean-centered individual and time-varying average teacher characteristics at the school level, principal characteristics, and other time-varying school characteristics. Individual and averaged teacher characteristics not shown include covariates for teacher gender, race, experience, highest degree attained, age, and salary; principal characteristics not shown include covariates for principal gender and experience; other time-varying school-level characteristics include covariates for student enrollment (logged), pupil-teacher ratio, and average student gender, race, free/reduced-price lunch status, special education status, limited English proficiency status, attendance rate, and a survey-based measure of school behavioral climate.

* $p<0.05$; ** $p<0.01$; *** $p<0.001$.