WORKPLACE SUPPORT AND DIVERSITY IN THE MARKET FOR PUBLIC SCHOOL TEACHERS

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Abstract

Mentoring, and to a greater extent support from high-level administrators, has been shown to decrease worker turnover in general, but little is known about its differential impact on minority workers. Utilizing four waves of the Schools and Staffing Survey, we find that administrative support is most strongly associated with retention for minority teachers working in schools where minorities are underrepresented. This effect is pronounced for teachers new to the profession and those in schools with more students from low-income families or located in rural areas. The results indicate that workplace support is essential in maintaining or growing minority representation in relatively less-diverse organizations.

1. INTRODUCTION

Although there is general agreement on the importance of promoting diversity and inclusiveness in the workplace, it is less clear how to do so successfully. In theory, targeted mentoring and workplace support can help make organizations more diverse (see, e.g., Athey, Avery, and Zemsky 2000), but the literature offers little empirical evidence of the ways in which mentoring may have differential impacts on minority workers. In this paper we focus on public school teachers in the United States, asking whether providing more workplace support (holding other workplace conditions constant) can aid in the retention of minority teachers and can ameliorate the difference in turnover rates between white and minority teachers. We further investigate whether minority teachers benefit more from workplace support in relatively nondiverse schools.

Differential turnover rates and impacts of administrative support are rooted in social identity theory. Our empirical model is based on a theory of turnover, in which the likelihood of changing employers is negatively related to the utility derived from one's current job. Utility increases, but with diminishing returns, from administrative support and from the closeness of one's racial or ethnic identity to that of coworkers. We treat social identity and support as nonseparable in the utility function and consider the case when administrative support matters more for those who are considered outsiders to the social group. In our context, minority teachers who teach in nondiverse schools derive less utility from the social setting than their white colleagues. An increase in administrative support therefore has a greater marginal impact on their utility and thus turnover, given that utility has diminishing returns from overall support.

Using data from four consecutive waves of the Schools and Staffing Survey (SASS), we first confirm the established result that teachers are more likely to stay at their current school if they perceive higher levels of support from the administration. However, when we look at minority and white teachers separately, we uncover a novel pattern in teacher turnover that is consistent with social identity theory. The relationship between administrative support and retention is strongest for minority teachers employed at schools where minorities are underrepresented. Perceived support from parents follows a similar but less clear-cut pattern. Support from coworkers has a less clearly defined role in aiding retention. The relationships we uncover are most pronounced for teachers who are relatively new to the profession and in schools located in rural areas or with more students from low-income families. Our results are robust to a variety of different specifications.

Turnover is costly for any organization, but turnover among teachers has particularly strong policy implications. There is evidence that teacher turnover has negative impacts on student achievement. Hanushek's (1997) review of a large set of studies that use a value-added methodology suggests a positive link between teacher experience and student performance. Using data on fourth- and fifth-grade students in New York City, Ronfeldt, Loeb, and Wyckoff (2013) show that teacher turnover is associated with lower math and reading scores, and even students whose teachers did not change jobs are affected negatively by high turnover at the school. Jackson and Bruegmann (2009) find peer effects in teacher performance, which implies that losing effective teachers has negative spillover effects on those teachers who remain at the school. Kraft (2015) shows evidence that losing inexperienced but effective teachers through seniority-based

layoffs necessitated by district budget cuts has negative effects on student achievement, an argument also made by Boyd et al. (2011a).

Retention of minority teachers in schools where they are underrepresented is especially important. Although schools with a small percentage of minority teachers also tend to have smaller fractions of minority students, there tend to be more minority students per minority teacher in these less-diverse schools. The presence of minority teachers may then help close the achievement gap between white and black students,[1] and there could be additional role model effects.

Numerous studies have examined how teacher, student, and school characteristics are related to teacher turnover.[2] Using data on teachers and schools in Texas, Hanushek, Kain, and Rivkin (2004) observe that white teachers are more likely to exit schools with a higher fraction of minority students, whereas minority teachers are less likely to leave a school the higher the fraction of minority students. Across a variety of different data sources, workplace support from the administration has been shown to play an especially important role in retention (Boyd et al. 2011b; Grissom 2011; Ladd 2011).

Far less attention has been paid to the interaction of teacher characteristics, such as race, and factors related to the school's administration. Previous studies of teacher turnover (e.g., Ladd 2011) include a rich set of controls for working conditions, teacher characteristics, and school characteristics, but no interactions between administrative support and teacher or school variables.[3] Grissom (2011) uses SASS data to show that principal effectiveness is especially strongly correlated with teacher satisfaction and turnover in schools with a high fraction of minority students or students eligible for free or reduced-price lunch, but this relationship is not investigated separately for minority and nonminority teachers. Hanushek, Kain, and Rivkin (2004) show that turnover is lower among black and Hispanic teachers when they are employed at schools with a higher fraction of minority students, but their study does not incorporate factors related to the school's administration. Two exceptions are Grissom and Keiser (2011), who find that minority teachers report higher levels of job satisfaction and have lower turnover rates if their principal is also a minority, and Grissom, Nicholson-Crotty, and Keiser (2012), who show that male teachers are more likely to change jobs when working under a female principal.

2. MOVING ACROSS SCHOOLS VERSUS LEAVING THE PROFESSION

In this study we focus on teachers who stay in the profession and examine the choice to remain at one's current school or to change employers within the same occupation. Teachers who continue teaching at their current school are commonly referred to as

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1. Using random assignment of students and teachers to different-sized classrooms, Dee (2004) finds that there are gains in math and reading scores when students are taught by an own-race teacher. Further, there is evidence that subjective evaluations of students by teachers are higher when the teacher and student share the same race (Ehrenberg, Goldhaber, and Brewer 1995; Dee 2005). Fairlie, Hoffmann, and Oreopoulos (2014) examine a similar issue in a higher education setting. In their study of one community college where the fraction of minority instructors is about 16 percent and minority students constitute 21 percent of the student body, they find that the performance gap between white and minority students is smaller in classes taught by a minority instructor.
2. Grissom, Viano, and Selin (2015) offer an extensive review of the literature.
3. Ladd's (2011) focus is on differences by school level in the factors related to teacher mobility, so she shows separate estimates for elementary, middle, and high schools in North Carolina.

"stayers." "Movers" are defined as teachers who continue teaching but at a different school. Finally, "leavers" are teachers who are not in a teaching occupation when observed in a follow-up survey.

Although many previous studies do not differentiate between moving to another school and leaving the teaching profession, others have emphasized how important it is to make this distinction (Hanushek, Kain, and Rivkin 2004; Kukla-Acevedo 2009; Grissom, Viano, and Selin 2015; Feng and Sass 2016). Using multinomial choice models and two different datasets, Kukla-Acevedo (2009) and Ladd (2011) find that administrative practices are more closely related to the likelihood of moving than of leaving relative to staying, especially for elementary and middle school teachers. More generally, the distinction between occupational changes and job changes within an occupation has long been emphasized by labor economists (e.g., Neal 1999). Previous studies, such as Gibbons et al. (2005), have modeled occupation-switching as part of a process in which workers learn about their ability and their areas of comparative advantage. If workplace support enhances learning about one's ability, it may even be the case that it is associated with higher probability of occupation changes, particularly among workers with low levels of labor market experience.

Teachers who leave the profession often do so for personal reasons, such as retirement, pregnancy, or health. Dolton and van der Klaauw (1999) study exits separately by destination (nonteaching sector or nonwork) and by whether the departure was voluntary. They find that different factors drive each type of move. Stinebrickner (2002) also finds that different factors play a role for going into a new occupation compared to leaving the labor force. The results of these studies are an important indication that leavers should not all be grouped together, but the SASS does not offer information that is detailed enough to allow us to distinguish between the different categories of exits. Further complicating the analysis, the time period covered by the data we use includes the Great Recession, when alternative options outside of teaching, shown to be an important factor for the decision to leave (Dolton and van der Klaauw 1999), changed considerably.

The Teacher Follow-Up Survey (TFS), which is based on a subsample of teachers who responded to the SASS and is administered a year later, collects information on the main reason for moving or leaving the teaching profession. Responses commonly given by leavers in the 2012–13 TFS are retirement (23 percent of leavers) or "other personal life reasons (e.g., health, pregnancy/childcare, caring for family)" (17 percent). These turnover decisions are relatively unlikely to be affected by personnel management practices such as workplace support. Stinebrickner (2002) uses longitudinal data of high school graduates to show that changes in family circumstances are commonly the main reason for teachers leaving the profession. At the same time, most movers in the 2012–13 TFS report the main reason for moving to be location (24 percent), dissatisfaction with the administration (12 percent), or specific desire to teach at their new school (12 percent). These responses lead us to believe that the decision to move is considerably more likely to be influenced by school-level factors than the decision to leave.

In summary, we differentiate between movers and leavers and focus the analysis on the former because we believe the SASS data are better suited to analyze job changes within teaching and because workplace support is more likely to play a role in the decision to move. In the analysis that follows we exclude leavers from the sample and

estimate binary choice models of turnover measured as moving to a different school, but we verify the robustness of our results to estimating a multinomial choice model that includes leaving the profession as an outcome.

3. THEORETICAL FRAMEWORK

Turnover in the labor market is often modeled as a process in which workers compare the utility associated with their current job to that of the next best alternative. When own-race and the race of one's coworkers enter a worker's utility function, they will be important determinants of retention.

Race mismatch between an individual and her coworkers is important in social identity theory, where a person gains more utility in a group setting if the other members of the group are of a similar type. Strunk and Robinson (2006) provide evidence that teachers in particular seek to work with other same-race colleagues to preserve their social identity, and Cannata (2010) finds social identity to play a role in the initial application process. This is important because the social networks formed at work are thought to play a large role in the transmission of knowledge. Isolation from these networks and their benefits can disadvantage the minority group.

Social identity theory is related to isolation theory. Theories of isolation or being in a numerical minority predict higher turnover for workers in the minority group. In a study of workers at a large national chain, Leonard and Levine (2006) find that turnover is significantly greater for black and Hispanic workers when there are more white coworkers and fewer coworkers of the same race or ethnicity.

Workplace support is also important for turnover. Boyd et al. (2011a) study the importance of a wide range of teacher and school characteristics for the retention of teachers in New York City and show perceptions of the school's administration to be the most important factor. Grissom (2011) and Ladd (2011), among others, have also shown administrative support to play a central role in decreasing turnover for teachers.

Our contribution is to incorporate the interaction between social identity and administrative support. Using utility representation, we can express the probability of moving for individual j as

$$Pr(Move_j) = Pr[U(\alpha_j, P_j) \leq \bar{U}],$$

where α_j measures the level of administrative support for worker j; P_j is the proportion of same-race coworkers; and $\bar{U}$ represents the expected utility of the next best available job.[4]

The well-documented connection between administrative support and turnover is consistent with the assumption that $\frac{\partial U(\alpha_j, P_j)}{\partial \alpha_j} > 0$. Social identity and isolation theories predict that $\frac{\partial U(\alpha_j, P_j)}{\partial P_j} > 0$. Most standard utility functional forms incorporate diminishing returns to administrative support and to the fraction of the group with the same race or ethnicity but we further impose the assumption that $\frac{\partial U(\alpha_j, P_j)}{\partial \alpha_j \partial P_j} \leq 0$.[5] That is, administrative support has less of an effect for employees with many same-race coworkers or, conversely, it is even more important for a minority teacher who is part of a numerical

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4. Alesina and La Ferrara (2000) introduce a similar utility function, but in their model the parameter α_j measures a person's distaste for socializing with other-race individuals.

5. A simple example of such utility function is $U = (\alpha_j + P_j)^{1/2}$.

minority. The marginal impact of an increase in administrative support will then be larger for an individual when the proportion of workers of a different race is larger.

Empirically, we estimate a linear probability model for worker j in school s at time t:

$$Pr(Move_j) = X_j\beta_1 + Z_{st}\beta_2 + \beta_3\alpha_j + \beta_4 M_j + \beta_5(\alpha_j \times M_j) + \gamma_s + \nu_t, \tag{1}$$

where X_j is a vector of worker characteristics, Z_{st} are time-varying school and principal covariates, and M_j is an indicator for minority status. The parameters γ_s and ν_t represent school- and survey-year fixed effects, respectively. The assumption that $\frac{\partial U(\alpha_j, P_j)}{\partial \alpha_j} > 0$ corresponds to $\beta_3 < 0$. We estimate the model in equation 1 separately for schools with low and higher levels of racial and ethnic diversity. Then β_4 should be positive at non-diverse schools when $\frac{\partial U(\alpha_j, P_j)}{\partial P_j} > 0$. Finally, the cross-partial derivative being negative implies that $\beta_5 < 0$ at schools where minority teachers are greatly underrepresented. The next section describes the data we use in the estimation of the empirical model in equation 1, and the results are presented in section 5.

4. DATA

We use the 1999–2000, 2003–04, 2007–08, and 2011–12 waves of the SASS, conducted by the National Center for Education Statistics (NCES). A new sample of schools is selected each year using a stratified sampling design; school administrators complete a school and a principal questionnaire. The SASS includes both public and private schools but we focus our analysis on the public schools in the data. The NCES assigns a unique time-invariant identification number to each school, which makes it possible to link observations for schools surveyed multiple times. About 19 percent of public schools in the data appear in multiple waves.

Teachers within each sampled school are also stratified and sampled at random. The sampled teachers complete a separate teacher questionnaire. A follow-up survey administered at the beginning of the following academic year collects information from the principal on whether each of the teachers in the sample remained at the same school, continued teaching at another school, or left the teaching profession. This follow-up survey allows us to examine what factors are related to teacher turnover.[6] As discussed in section 2, we exclude movers from the sample.[7]

From the school questionnaire, we use data on the racial and ethnic composition of students and all teachers, including those not sampled; the fraction of students approved for free or reduced-price lunches under the National School Lunch Program;

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6. Preferably, turnover information would be collected from teachers rather than from administrators. A subset of the teachers who are SASS respondents are interviewed at the beginning of the following academic year for the TFS and are asked to report their employment status. Comparing weighted teacher and principal responses from the 2005 TFS shows that 97.5 percent of teachers reported as stayers by their principal also self-reported as stayers; the fraction of teachers correctly classified as stayers is 99 percent if leavers are excluded from the sample. Principals identify movers correctly 79.6 percent of the time, but this number increases to 87 percent if leavers are not taken into account. Principals are correct in identifying leavers 69 percent of the time, but 25 percent of the teachers whom principals classify as leavers self-report to be movers. We use principals' responses rather than information from the TFS because the TFS has considerably fewer respondents and sample selection is nonrandom, disproportionately sampling movers and leavers.

7. A small fraction of teachers is on shorter-term leave (about 1 percent), remain at their current school but in a nonteaching position (less than 0.5 percent), are deceased (fewer than 0.1 percent) or have unknown status (less than 0.25 percent); they are also excluded from the analysis.
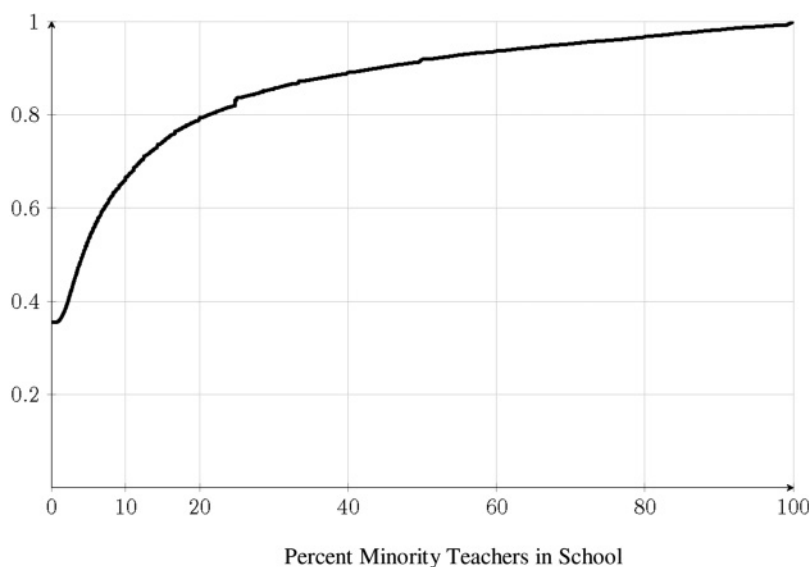
Figure 1. Cumulative Distribution of the Fraction of Minority Teachers per School

the size of the school and the student–teacher ratio; and for some specifications, the school's location based on the NCES "urban-centric" classification system.[8] Information that we use from the principal questionnaire includes race and ethnicity, gender, education, experience as principal and as teacher, and tenure as principal at the current school. The teacher questionnaire provides information on teachers' gender, race, ethnicity, education, years of teaching experience, subject and grade assignment, tenure, union membership, and school-related annual earnings.

In our study we define "minority" as nonwhite or Hispanic.[9] Figure 1 shows the distribution of the fraction of minority teachers at public schools sampled in the 1999, 2003, 2007, and 2011 waves of the SASS. There are no minority teachers in 37 percent of the schools in the data.[10]

For the purposes of our analysis, we define "low-minority" schools to be those that employ 10 percent or fewer minority teachers, which includes over two thirds of the surveyed schools. "High-minority" schools are defined as those where 15 percent or more of the teachers are minority, which constitutes the top quartile of the distribution. The use of the term "high-minority" is relative here because 15 percent minority is not a high number in absolute terms, but these schools are fairly diverse compared with most public schools in the United States. Schools where the fraction of minority teachers is

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8. The system was introduced in 2006. It is based on the proximity of the school's location to an urbanized area and has four major categories: city, suburban, town, and rural.

9. There are not enough minority teachers in the surveyed schools to conduct the analysis separately for each race and ethnicity. There are no Asian teachers at more than 75 percent of the schools; the case is similar for Native American teachers. The 75th percentile of the distribution of the share of Hispanic teachers is 3 percent, and the corresponding number for the share of black teachers is 5 percent.

10. The share of minority teachers is derived from the school questionnaire, which is usually completed by the principal. About 4 percent of teachers in the sample who self-report as nonwhite or Hispanic work at schools where the reported share of minority teachers is zero, suggesting that in some cases administrators may not be aware of a teacher's minority status. Most of these teachers self-report as Native American or Hispanic; only 1 percent of black teachers are observed at schools where the share of minority teachers is recorded as zero.

between 10 and 15 percent are excluded from most of the analyses, but in section 5 we examine the robustness of the results to using alternative cutoffs. Furthermore, we restrict our analysis to full-time teachers.

Our final sample includes 114,120 public school teachers at 21,860 unique schools.[11] Combining all waves of the SASS, only 1,570 of the teachers appear as a unique observation within a school; the modal number of sampled teachers from a given school is three and the median is four, but 5 percent of schools have fifteen or more teachers in the final estimation sample, accounting for 17 percent of teachers in the data. Appendix table A.1 shows descriptive statistics at the teacher level for the variables used in the analysis for low-minority (columns 1 and 2) and high-minority (columns 3 and 4) schools. We use the SASS teacher weights in the calculation of the means and standard deviations. Columns 1 and 3 show descriptive statistics for minority teachers, and columns 2 and 4 summarize the variables for white non-Hispanic respondents. It is evident from table A.1 that over a one-year period, between 92 and 94 percent of nonleavers stay at the same school. The most likely stayers are nonminority teachers in low-minority schools.

Measures of Perceived Support

Surveyed teachers are asked a series of questions about their perception of various working conditions. Responses are given on a 4-point Likert scale, with 1 corresponding to "strongly agree" and 4 to "strongly disagree," but we reverse the scales so that higher numbers correspond to higher satisfaction with a given working condition. We select eight of the available variables to measure perceived support from the administration, from other teachers, and from parents. The first four measures align most closely with the concept of support from the principal: "The school administration's behavior toward the staff is supportive and encouraging"; "My principal enforces school rules for student conduct and backs me up when I need it"; "The principal knows what kind of school he or she wants and has communicated it to the staff"; and "In this school, staff members are recognized for a job well done." The next three statements correspond most closely to teacher cooperation and support: "Rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes"; "Most of my colleagues share my beliefs and values about what the central mission of the school should be"; and "There is a great deal of cooperative effort among the staff members." Finally, support from parents is measured by responses to the statement "I receive a great deal of support from parents for the work I do."

Coefficients of correlation between the support measures are shown in table 1. Each of the administrative support measures tends to be most highly correlated with the other administrative support measures (correlations between 0.50 and 0.61), slightly less highly correlated with the teacher support variables (correlations between 0.26 and 0.51), and least strongly correlated with perceived parental support (correlation coefficients ranging from 0.18 to 0.25). Similarly, teacher support measures are most strongly correlated with other teacher support variables, and least strongly correlated with parent support. Based on our interpretation of the underlying survey questions, the correlations in table 1, and results from principal component analysis, we group administrator,

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11. All sample sizes in the paper are rounded to the nearest ten as per NCES restricted-use data requirements.

Table 1. Correlations Between Survey Measures of Support

	Supportive Administration	Principal Enforces Rules	Principal Communicates	Staff Recognized	Teachers Enforce Rules	Colleagues Share Beliefs	Cooperation	Parent Support
Supportive administration	1							
Principal enforces rules	0.59	1						
Principal communicates	0.57	0.61	1					
Staff recognized	0.57	0.50	0.55	1				
Teachers enforce rules	0.35	0.46	0.42	0.41	1			
Colleagues share beliefs	0.26	0.29	0.37	0.35	0.51	1		
Cooperation	0.39	0.38	0.45	0.51	0.47	0.53	1	
Parent support	0.18	0.22	0.18	0.25	0.25	0.21	0.24	1

teacher, and parent support into three distinct measures but also explore the possibility that principal and teacher support measure the same concept and should be grouped together. We use principal component analysis to group the support measures; the factor loadings are shown in Appendix table A.2. We construct a combined school support measure that incorporates perceived administrative and teacher support, as well as two separate support indices.[12] We standardize each of the variables we construct to have a mean of 0 and standard deviation of 1 in the sample; because parent support is based on a single survey question, we leave it as a 4-point scale.

Ideally, we would like to also have an objective measure of the support received by each teacher in the sample so that we can compare the roles of perceived and actual support, but the SASS does not offer such measures. Ladd (2011) shows that perceptions of working conditions are more predictive of turnover intentions than actual departure rates, but perceived principal effectiveness is related to actual turnover and to students' subsequent math test scores. In the interpretation of our results, we emphasize that we uncover a novel relationship between turnover and perceived support, rather than actual principal effectiveness. Perceptions of support are important for policy because the most direct way to change them is by actually providing more support.

Figure 2 shows histograms comparing the distributions of administrative, teacher, and parent support reported by minority and nonminority teachers at less and more diverse schools. One observation that stands out is that conditional on the type of school, perceived support does not differ much by race and ethnicity. Teachers at nondiverse schools report slightly higher levels of support. The distributions are generally left-skewed, with high fractions of teachers indicating high or very high support levels.

As further evidence that the levels of perceived support are similar for minority and nonminority teachers at nondiverse schools, and to explore in more detail the reliability of the support measures at the school level, in table 2 we show intraclass correlation coefficients for these measures. In particular, we estimate random effect models of the form

$$Support_{js} = \mu + u_s + e_{js}$$

12. We verified that our results are robust to including the support measures separately in the model or to excluding subsets of them and find that all administrative support variables have a similar relationship with turnover for the different groups of teachers we consider.
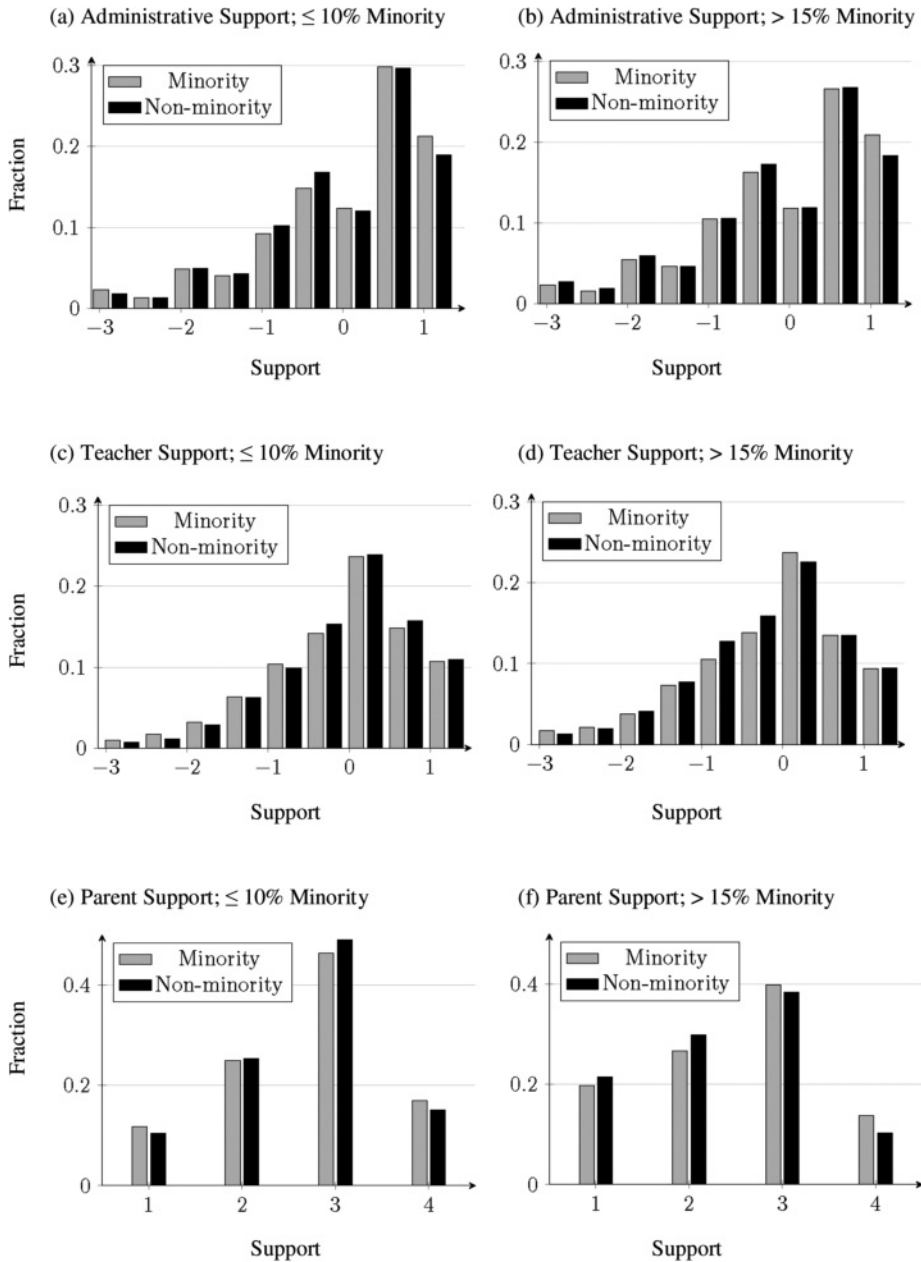
Figure 2. Distribution of the Support Measures

for teacher j at school s and use the estimated variances of u_s and e_{js}, σ_u^2 and σ_e^2 respectively, to calculate and report $\sigma_u^2/(\sigma_u^2 + \sigma_e^2)$. We would expect the intraclass correlation to increase when minority teachers are excluded from the sample if these teachers report very different levels, but table 2 shows this is not the case at low-minority schools. We do see a slight increase at more diverse schools, suggesting race- or ethnicity-based differences in perceived support at such schools. The intraclass correlations are around

Table 2. Intraclass Correlations for Support Measures

	≤10% Minority		>15% Minority	
School support	0.217	0.218	0.186	0.224
Administrative support	0.203	0.204	0.179	0.210
Teacher support	0.192	0.193	0.158	0.193
Parent support	0.124	0.126	0.131	0.173
N	83,890	79,890	30,230	18,240
Sample	All	Nonminority	All	Nonminority

Notes: The table shows the ratio $\sigma_u^2/(\sigma_u^2 + \sigma_e^2)$ where σ_u^2 and σ_e^2 are, respectively, the estimated variances of u_s and e_{js} in the random effects model $Support_{js} = \mu + u_s + e_{js}$. Each cell in the table represents the results from a separate regression model. Sample sizes are rounded to the nearest 10.

0.2 (slightly lower for parent support), providing evidence that the measures are reliable but at the same time have enough within-school variation to allow us to estimate models with school fixed effects. We next examine how turnover is related to perceived support, particularly for minority teachers working at schools where few of their coworkers share their minority background.

5. EMPIRICAL ANALYSIS

As discussed in section 2, we examine turnover as the decision to move to a different school because we model workplace fit rather than occupational choice. Furthermore, leaving the profession is often driven by factors, such as retirement or pregnancy and child rearing, that are less likely to be influenced by workplace support than by personal considerations. We begin by examining descriptively how the relationship between turnover and perceived support differs for white and minority teachers at different points of the support distribution. We estimate local polynomial regressions of an indicator for moving to a different school on the measure of administrative support. The smoothed values from these regressions and corresponding 95 percent confidence intervals are shown in figure 3, where the smoothing is performed separately for four groups: minority and white teachers at schools with few minorities (figure 3a), and minority and white teachers at schools with a relatively high fraction of nonwhite or Hispanic teachers (figure 3b).

For all four groups, the probability of moving is strictly decreasing in perceived support. It is also evident from figure 3a that the difference in turnover between minority and white teachers at low-minority schools shrinks as support increases. At low levels of support, minority teachers at low-minority schools are close to 4 percentage points more likely to move than their nonminority coworkers; when support is very high, the difference in the probability of moving decreases to about 1 percentage point. It can also be seen from figure 3a that the convergence is gradual—the solid line that represents minority teachers is steeper than the dashed line representing nonminority teachers for all levels of support above −2.8.

Figure 3b repeats the analysis for the schools with a higher fraction of minority teachers. The difference in average turnover between minority and white teachers at high-minority schools is less than a percentage point for all values of support above −2.6, or more than 95 percent of the sample. Furthermore, the slopes of the two curves

(a) ≤ 10% Minority Teachers in School

(b) > 15% Minority Teachers in School
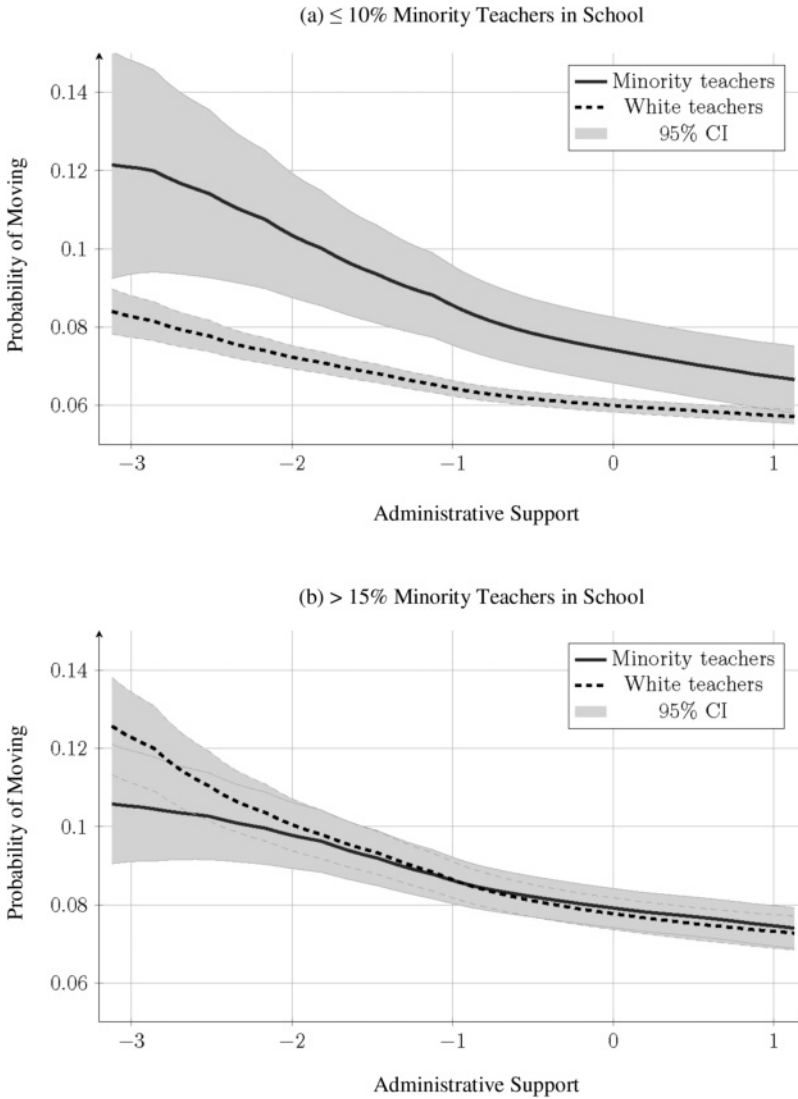
Notes: Smoothed values of a local polynomial regression of a binary variable equal to 1 for movers and 0 for stayers on the measure of perceived administrative support; Epanechnikov kernel and bandwith equal to 1. Leavers are excluded from the sample.

Figure 3. Administrative Support and Teacher Mobility

are very similar. Comparing the curves representing minority teachers in figure 3a and figure 3b suggests that the relationship between workplace support and the probability of moving is more strongly negative for minority teachers in schools where they are underrepresented. Conversely, the curve for white teachers is steeper in figure 3b than in figure 3a, suggesting that support matters more for retaining nonminority teachers in high-minority schools compared with white teachers with predominantly white coworkers. Considering all four curves in figure 3 reveals that turnover decreases fastest with workplace support for minority teachers at low-minority schools.

To estimate the relationship between turnover and support, we estimate a linear probability model in which the outcome is a binary indicator equal to 1 for movers and 0 for stayers, excluding leavers from the sample.[13] All support measures are interacted with teacher minority status to uncover any differential relationships by race or ethnicity. We include school fixed effects in the model in order to account for unobserved time-invariant school characteristics that may be simultaneously correlated with the level of administrative support and teachers' decision to move.[14] Additional controls include the teacher and principal characteristics from Appendix table A.1, as well as time-varying school characteristics. We also include indicators for teacher education, grades, and main subject taught. The models also include interactions between teacher and principal minority status and teacher and principal gender because Grissom and Keiser (2011) and Grissom, Nicholson-Crotty, and Keiser (2012) find that race and gender congruence between teachers and their principal are related to teacher turnover. We account for common shocks at the state-year level by clustering the standard errors.

The linear probability model is our specification of choice because with many schools in the data and often a small number of teachers per school, including school fixed effects in a nonlinear model, such as logit or probit, may lead to bias due to the incidental parameters problem. We verified that with state-by-year fixed effects, the linear probability, binary logit, and multinomial logit model with leaving the profession as an additional outcome, all produce similar marginal effects.

Table 3 shows estimation results when the sample is split into schools with 10 percent or fewer minority teachers (columns 1–4) and schools with more than 15 percent minority teachers (columns 5–8).[15] Support from parents enters each specification. The models in columns 1 and 5 include the composite measure of school support that combines support from the administration and from coworkers. This variable is negatively related to turnover, but at nondiverse schools the relationship is stronger for minority teachers—if school support increases by one standard deviation, the probability of a teacher moving decreases by 2 percentage points for minority and 1.3 percentage points for nonminority individuals. The pattern is reversed at more diverse schools—a standard deviation decrease in support is associated with 2.2 percentage point decrease in turnover for white teachers and 1.6 percentage point decrease for nonwhite or Hispanic teachers.

Administrative support is associated with lower mobility for all groups, but matters the most for minority teachers at schools with relatively few other nonwhite teachers. The model in column 2 shows that at nondiverse schools, the magnitude of the relationship between perceived principal support and turnover is almost twice as large

13. We do not use survey weights in the estimation. Given that our analysis focuses on the subsample of 4,000 minority teachers at low-minority schools, and probability weights in the SASS often exceed 200, the variability of our estimates for minority teachers in nondiverse schools increases substantially when we include weights. Outliers in terms of low selection probability can have excessive influence on the results, and we prefer to avoid the possibility that such outliers bias the coefficient estimates. Arguably, weights are not necessary when the models include school fixed effects and a rich set of other covariates on which the sample stratification is based.

14. Our results do not change much if we replace the school fixed effects with state-year or district-year indicators.

15. Alternatively, we can identify how the school's level of diversity affects the relationship between support and turnover by estimating a model with a triple interaction between support, teacher minority status, and the fraction of minority teachers at the school. Such models yield similar results, but we prefer to split the sample because estimating the models separately for low- and higher-minority schools makes the interpretation of the results more straightforward compared with the interpretation of the triple interaction results.

Table 3. Support and Teacher Mobility

	Dependent Variable: Moved to a Different School							
	≤10% Minority (N = 83,890)				>15% Minority (N = 30,230)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Nonminority × School support	−0.013*** (0.001)				−0.022*** (0.003)			
Minority × School support	−0.020*** (0.004)				−0.016*** (0.003)			
Nonminority × Administrative support		−0.013*** (0.001)		−0.012*** (0.001)		−0.022*** (0.003)		−0.019*** (0.003)
Minority × Administrative support		−0.025*** (0.004)		−0.030*** (0.006)		−0.018*** (0.003)		−0.021*** (0.003)
Nonminority × Teacher support			−0.009*** (0.001)	−0.003** (0.001)			−0.015*** (0.002)	−0.006** (0.002)
Minority × Teacher support			−0.007 (0.004)	0.009 (0.006)			−0.007** (0.003)	0.004 (0.003)
Nonminority × Parent support	−0.004*** (0.001)	−0.004*** (0.001)	−0.005*** (0.001)	−0.004*** (0.001)	−0.001 (0.002)	−0.002 (0.002)	−0.003 (0.002)	−0.001 (0.002)
Minority × Parent support	−0.010* (0.005)	−0.010* (0.005)	−0.014*** (0.005)	−0.011** (0.005)	−0.004 (0.003)	−0.004 (0.003)	−0.006** (0.003)	−0.004 (0.003)

Notes: Results from linear probability model. The sample is limited to teachers who remained at the same school or continued teaching at a different school. All specifications include school fixed effects; the teacher, principal, and school characteristics listed in Appendix table A.1; indicators for teachers' education, grades, and main subject taught; and interactions between teacher and principal minority status and teacher and principal gender. The errors are clustered at the state–year level. The sample sizes are rounded to the nearest 10.

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

for minority than it is for nonminority teachers, and the difference is highly statistically significant. One standard deviation increase in administrative support is associated with a 2.5-percentage point decrease in the probability that a nonwhite or Hispanic teacher moves. The coefficient estimate decreases even further to −0.03 when we hold perceived teacher support constant (column 4). This relationship is not only statistically but also economically significant, given that only about 8 percent of minority teachers move in a given year. As a comparison, the corresponding decrease in the turnover rate for white non-Hispanic teachers at mostly white schools is 1.2–1.3 percentage points. Consistent with what we observe in figure 3, we find the relationship between administrative support and turnover differs little by minority status at more diverse schools, where one standard deviation increase in support is associated with about a 2-percentage point decrease in the probability of moving.

The models in columns 3 and 7 of table 3 show results for the relationship between support from other teachers and turnover. This relationship is negative for all teachers but is not statistically significant for minority teachers at nondiverse schools (column 3). The magnitude is largest for white non-Hispanic teachers at relatively high-diversity schools, where one standard deviation increase in perceived teacher support decreases turnover by 1.5 percentage points. Overall, it is evident that support from other teachers matters less for turnover than support from the principal, and this becomes especially clear when administrative and teacher support are included jointly in the model (columns 4 and 8). While including teacher support does not attenuate the relationship between turnover and administrative support, the reverse is not true. The magnitude of the coefficient on teacher support decreases to −0.003 in column 4 and −0.006 in

column 8 for nonminority teachers, and becomes positive but not statistically significant for minority teachers when support from the principal is held constant.

The positive relationship between teacher support and turnover for minority teachers is at odds with the theory that support should be associated with lower mobility. One plausible explanation is that the variable we use measures a concept different from teacher support. For example, conditional on support from the principal, agreement with the statement that "Rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes" may mean there are problems related to student discipline at the school. Another explanation for why teacher support and cooperation are in some cases associated with higher mobility can be inferred from open-ended responses in the 2012 TFS to the question that asks teachers to provide their reason for moving. Responses include the statements "I took a transfer in order to ensure that a colleague would not be transferred" and "One teacher needed to volunteer to relocate for one year. I volunteered."

Support from parents, which enters all models in table 3, is associated with lower probability of turnover. Similar to support from the administration, the relationship is strongest for minority teachers at low-minority schools, for whom one standard deviation increase in parental support decreases the probability of moving by about 1 percentage point on average. Additional coefficient estimates from some of the specifications are shown in Appendix table A.3. Because the model includes school fixed effects, school and principal characteristics measure the impact of changes over time, which in most cases are not substantial. The estimated coefficients for these variables are noisy and typically not statistically different from zero and are not shown. Consistent with the findings in Grissom and Keiser (2011), minority teachers, particularly at low-minority schools, have lower turnover rates when supervised by a minority principal. We do not find a statistically significant difference in turnover rates based on gender congruence between the teacher and principal. The relationship between salary and the probability of moving is negative but not statistically significant—this result is consistent with the findings in Hanushek et al. (2004) and Scafidi, Sjoquist, and Stinebrickner (2007), who provide evidence that salary plays a relatively small role in the decision to move to another school.

Appendix table A.4 verifies the robustness of the main results to estimating a multinomial logit model.[16] The estimated relative risk ratios in columns 2 and 4 and their statistical significance align with the findings in columns 4 and 8 of table 3. Columns 1 and 3 of table A.4 suggest that for minority teachers in nondiverse schools, the decision to leave the profession is driven by different factors from the decision to move. The social isolation theory we discuss in section 3 ignores issues such as intrinsic motivation that are likely to play an important role for selection into or out of teaching. The results for leaving the teaching profession in columns 1 and 3 of table A.4 have important policy implications and should be investigated further in future research.

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16. The estimated model includes a set of state-by-year indicators rather than school fixed effects. Because there are many schools in the data and typically a small number of teachers per school, including school fixed effects in a nonlinear model may lead to bias.

Robustness of the Results to Redefining Diversity

The robustness of the main results to using alternative cutoffs for splitting the sample by the share of minority teachers at a school is explored in Appendix table A.5. First, the results in column 1 exclude from the sample of nondiverse institutions schools that report no minority teachers; the coefficient estimates are comparable to those in column 4 of table 3. Column 2 includes only the schools that report no minority teachers. As discussed in section 4, this sample includes a small fraction of teachers with self-reported minority status. The estimated relationship between administrative support and the probability of moving is 3.1 percentage points higher for nonwhite or Hispanic teachers in this group. The sample of schools that report a nonzero share of minority teachers is split into four groups of approximately equal sizes and the results for each of these groups are shown in the remaining columns of table A.5. These results suggest that administrative support matters more for minority teachers' turnover the less diverse their school is, and the difference in the estimated coefficients by race and ethnicity shrinks as diversity increases. It should be noted that the most diverse group includes schools with 23 percent or more minority teachers. Restricting the sample further to more diverse schools results in small sample size and noisy coefficient estimates in the presence of school-level fixed effects. The coefficient on parent support for minority teachers also becomes less negative as the level of diversity increases, but because its magnitude is smaller and standard errors are fairly large, we cannot reject the null hypothesis that the coefficients are equal to zero across the specifications in columns 2–6. No clear-cut pattern emerges for the estimated coefficients of teacher support.

Appendix table A.6 further shows that the results are robust to redefining the minority variable to focus on black teachers rather than grouping all nonwhite or Hispanic individuals together. As we point out in section 4, the representation of other minority groups is too low to conduct the analysis separately for them. We split the sample into schools with fewer than and more than 10 percent black teachers; just over 10 percent of schools report having more than 15 percent black teachers among their staff, so we lower the cutoff for more diverse schools in order to increase the sample size and accuracy of the estimates. Table A.6 shows similar trends to what we observe in table 3—administrative and parent support matter more for black than for nonblack teachers at nondiverse schools. The relationship between support and turnover does not differ by race in more diverse schools. When administrative and parent support are held constant, teacher support has a positive but not statistically significant relationship with the probability of moving for black teachers in both types of workplaces.

Results by Subgroup

It is well known that turnover is considerably higher among teachers who are new to the profession. Among teachers in the data (including leavers) with five or fewer years of experience in the profession, 78 percent remain at the same school over the course of one academic year. The corresponding fraction is 87 percent for more experienced teachers, where separations are much more likely to include retirements. Whereas only 5 percent of more experienced teachers move to a different school, 11 percent of teachers

Table 4. Turnover Results by Subgroup

	Dependent Variable: Moved to Different School					
Sample	Experience ≤5 (1)	Experience >5 (2)	High % NSLP (3)	Low % NSLP (4)	Town/Rural (5)	Urban (6)
	Panel A. ≤10% Minority Teachers in School					
Nonminority × Administrative support	−0.018*** (0.004)	−0.009*** (0.001)	−0.016*** (0.002)	−0.008*** (0.002)	−0.011*** (0.002)	−0.013*** (0.002)
Minority × Administrative support	−0.055*** (0.018)	−0.025*** (0.006)	−0.036*** (0.010)	−0.026*** (0.007)	−0.035*** (0.007)	−0.024*** (0.008)
Nonminority × Teacher support	−0.005 (0.004)	−0.002* (0.001)	−0.0005 (0.002)	−0.004*** (0.002)	−0.003* (0.002)	−0.002 (0.002)
Minority × Teacher support	−0.003 (0.016)	0.016*** (0.005)	0.005 (0.009)	0.012* (0.007)	0.011 (0.008)	0.008 (0.008)
Nonminority × Parent support	−0.009** (0.004)	−0.002 (0.001)	−0.006*** (0.002)	−0.002 (0.002)	−0.005*** (0.001)	−0.001 (0.002)
Minority × Parent Support	0.009 (0.012)	−0.010* (0.005)	−0.004 (0.008)	−0.016** (0.007)	−0.016** (0.008)	−0.007 (0.007)
N	19,380	64,510	33,240	50,650	51,140	32,750
	Panel B. >15% Minority Teachers in School					
Nonminority × Administrative support	−0.029*** (0.008)	−0.018*** (0.003)	−0.018*** (0.004)	−0.019*** (0.004)	−0.019*** (0.005)	−0.018*** (0.004)
Minority × Administrative support	−0.016** (0.008)	−0.017*** (0.003)	−0.020*** (0.004)	−0.020** (0.008)	−0.021*** (0.005)	−0.021*** (0.004)
Nonminority × Teacher support	−0.007 (0.007)	−0.001 (0.003)	−0.006* (0.004)	−0.005 (0.005)	−0.006 (0.004)	−0.006* (0.003)
Minority × Teacher support	0.006 (0.007)	−0.0004 (0.004)	0.006* (0.003)	−0.007 (0.009)	0.003 (0.005)	0.004 (0.004)
Nonminority × Parent support	−0.005 (0.006)	−0.001 (0.003)	−0.0004 (0.003)	−0.003 (0.004)	−0.001 (0.004)	−0.001 (0.003)
Minority × Parent support	−0.016** (0.008)	−0.004 (0.004)	−0.005 (0.004)	−0.003 (0.008)	−0.001 (0.005)	−0.006 (0.004)
N	8,950	21,280	22,660	7,570	12,010	18,220

Notes: Results from linear probability model. The sample is limited to teachers who remained at the same school or continued teaching at a different school. All specifications include school fixed effects; the teacher, principal, and school characteristics listed in Appendix table A.1; indicators for teacher's education, grades, and main subject taught; and interactions between teacher and principal minority status and teacher and principal gender. The errors are clustered at the state–year level. The sample sizes are rounded to the nearest 10. NSLP = National School Lunch Program.

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

with five or fewer years of experience do so. Because turnover is lower among teachers with more experience, we next investigate whether minority teachers with fewer than 5 years of experience respond to workplace support differently compared to those with more experience.

We show estimation results in the first two columns of table 4 when the sample is split into teachers with five or fewer years of experience and individuals with more experience. Panel A shows results for nondiverse schools, and panel B shows results for schools with a relatively high fraction of minority teachers. The magnitudes of the estimated coefficients for administrative support in panel A are about twice as large for new teachers compared with the results in column 2. One standard deviation increase in administrative support decreases the probability of moving by 5.5 percentage points

for a new minority teacher and by 1.8 percentage points for a new white non-Hispanic teacher. The corresponding decrease is between 1.6 and 1.8 percentage points for three of the four groups in panel B (schools with a relatively high level of diversity), with only new nonminority teachers responding more strongly to administrative support. We also observe in panel A that the positive coefficient on teacher support for minority teachers at nondiverse schools is driven by individuals with more than five years of experience but this group's mobility decreases more in response to support from parents.

It is possible that the relationship we find between support and minority status is driven by school resources rather than, as we argue, by the fraction of other minority teachers at a given school. The racial and ethnic distribution of a school's workforce is highly correlated with the racial and ethnic distribution of its students, and also correlated with parental income. As Appendix table A.1 shows, the fraction of minority students, the fraction of students approved for free or reduced-price lunch, and the family poverty rate in the school's ZIP Code are all considerably higher in schools with a relatively high fraction of minority teachers. It is also likely that low-minority schools tend to have more resources, both financial and in terms of parental involvement. This is in line with the summary statistics in table A.1 showing higher levels of satisfaction with parental support in low-minority schools.

If the racial and ethnic composition of teachers is only acting as a proxy for the school's resources, then we should see a less pronounced relationship between support and turnover for minority teachers in a subsample of lower-resource schools. To investigate whether this is the case, we split the estimation sample based on whether the school's fraction of students approved for free or reduced-price lunch is higher or lower than the sample median in a given survey year and show the results in columns 3 and 4 of table 4.

The estimates for nondiverse schools in panel A suggest that support matters more for the turnover of both white and minority teachers in less-affluent schools compared with the results for schools with fewer free or reduced-price lunch eligible students presented in column 4. Administrative support is equally negatively correlated with moving for white and minority teachers at more diverse schools, regardless of whether these schools are drawn from the lower end of the distribution of parental income.

Finally, in columns 5 and 6 of table 4 we split the estimation sample by whether the school is located in a small town or rural area (column 5) or in a big city or its suburbs (column 6). The coefficient on administrative support is more negative in the rural subsample when looking at low-minority schools. Minority teachers who work in schools in less densely populated areas with few minority coworkers are more likely to take administrative support into account when deciding whether to move. The coefficient on the interaction between the administrative support measure and the minority indicator is −0.035 in column 5, whereas the corresponding coefficient in the subsample of low-minority schools in urban areas is −0.024. Support from parents is also more important for minority teachers at low-minority schools in more geographically isolated locations compared with minority teachers in urban low-minority schools. The relationship between administrative support and turnover does not depend on the school's location in the sample of more diverse schools (panel B).

Table 5. Distribution of the Ratio of Minority Students per Minority Teacher

	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
≤10% Minority teachers in school	3	10	28	61	105.5
>15% Minority teachers in school	9.3	15.6	23.9	36.3	52.2

Notes: Distribution of the number of minority students per minority teacher at the schools in the sample. The ratio is calculated as the number of nonwhite or Hispanic students divided by the number of nonwhite or Hispanic full-time or part-time teachers plus 1 to avoid dividing by 0 for the schools with no minority teachers.

6. CONCLUSION

Workplace support has been shown to decrease turnover for public school teachers of all demographic backgrounds. In this study, we document a more nuanced result, namely, that the effect of support is strongest for minority teachers in schools where minorities are underrepresented. Using four waves of data from the nationally representative Schools and Staffing Survey, we show that support from the school's administration reduces the likelihood of moving to a different school for all teachers but the relationship is especially pronounced for nonwhite or Hispanic teachers at schools where 10 percent or fewer of all teachers are also nonwhite or Hispanic. Focusing on teachers who are new to the profession strengthens the result.

Concerns over the higher turnover rates of minority teachers have been expressed in the literature (e.g., Achinstein et al. 2010). The findings we present are particularly relevant given that it has been found that turnover is higher for minority teachers who teach in less diverse schools (Hanushek, Kain, and Rivkin 2004), and a similar trend of higher turnover for minority workers in nondiverse organizations has been documented in other labor market settings (Leonard and Levine 2006). Table 5 shows that there tend to be more minority students per minority teacher in less-diverse schools, which further underscores the importance of retaining these teachers. For example, the median number of minority students per minority teacher is twenty-eight in less-diverse schools and slightly lower, twenty-four, in more diverse schools. The ratio grows to two to one at the 90th percentile. Our results suggest that one way to increase diversity through retaining current minority employees is by providing more workplace support.

This work has important policy implications for principal staffing. If a school's goal is to increase the diversity of its staff, then placing principals with a demonstrated history of providing workplace support, especially to minority teachers, can increase diversity through retention. The implications for increasing diversity in organizations are even broader if our results are shown to be applicable in other labor market settings. One limitation of the paper is that the data provide only a measure of perceived, rather than actual, workplace support. Having both available would be more informative but results in studies such as Ladd (2011) affirm the usefulness of measures of teachers' perceptions of their working conditions.

Another limitation is that we do not observe where most of the teachers in the study move to, so it is difficult to assess the full benefit of retaining minority teachers at their current school. Although there are documented benefits of increasing diversity in the workplace, some of these teachers may move to harder-to-staff schools. Figure 4

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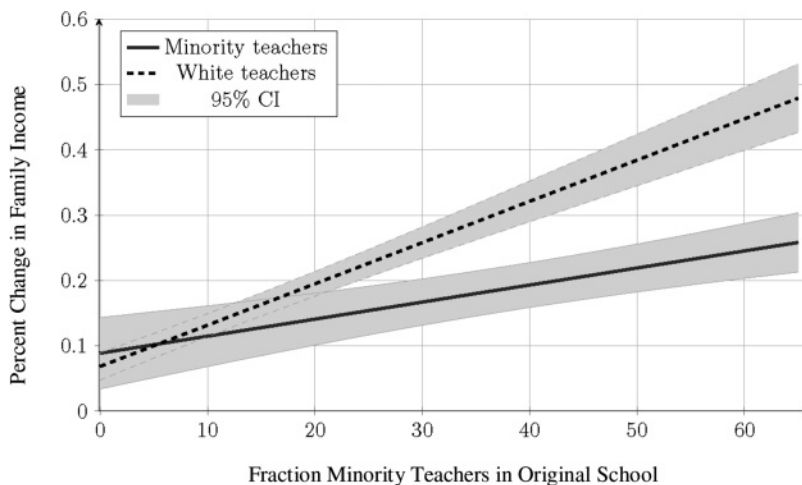
Notes: Predicted values based on coefficient estimates and standard errors from the regression model $\%\Delta FamInc = \beta_0 + \beta_1 MinorityTeacher + \beta_2 FractionMinority + \beta_3 (MinorityTeacher \times FractionMinority) + \alpha_{1999} + \alpha_{2003} + \alpha_{2007} + \varepsilon$. The sample consists of 3,320 teachers from the main estimation sample who were followed in the Teacher Follow-up Survey and indicated they moved to a different school. $\%\Delta FamInc$ is the percent change in average family income in the ZIP Code of the school where a teacher works. It is calculated as $\%\Delta FamInc = (FamInc_{TFS} - FamInc_{SASS})/FamInc_{SASS}$, with average family income based on the 2000 Census. Sample sizes are rounded to the nearest 10.

Figure 4. Percent Change in Average Family Income in School ZIP Code for Movers

offers crude evidence that teachers who move tend to go to schools in more affluent areas, nonminorities more so than minorities, especially if they leave a school with a high fraction of minority staff. The figure shows that for the 3,320 teachers in our sample who are followed in the TFS and report moving, the 2000 Census mean family income in the ZIP Code of the school in which they work is, on average, higher after the move. The predicted increase is small, about 10 percentage points, for respondents who leave schools with low fraction of minority teachers. It is more pronounced for teachers who leave more diverse schools, particularly if they are white. The trends in figure 4 are an indication that even minority teachers who leave schools with nondiverse staff tend to move to schools in areas where families have more resources, which provides some evidence that these teachers do not go to schools where they can serve more disadvantaged students.

The SASS data do not allow us to link retention of minority teachers in nondiverse schools to student performance, but it is important for future research to examine how administrators' support for teachers from underrepresented minority groups translates to student achievement, especially for minority students. It is also essential to understand better the mechanism through which supportive principals help retain minority teachers in nondiverse schools, whether it is through improving teaching effectiveness, fostering a more accepting climate, or implementing other policies that have a differential impact on nonwhite or Hispanic teachers.

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APPENDIX A: ADDITIONAL DATA

Table A.1. Summary Statistics for Schools and Staffing Survey (SASS) Sample

	≤10% Minority Teachers		>15% Minority Teachers	
	Minority	Nonminority	Minority	Nonminority
	(1)	(2)	(3)	(4)
Stay at current school	0.92	0.94	0.92	0.92
Move to different school	0.08	0.06	0.08	0.08
School support	0.15 (0.98)	0.13 (0.96)	0.04 (1.04)	−0.03 (1.03)
Administrative support	0.14 (0.98)	0.08 (0.97)	0.02 (1.02)	−0.03 (1.04)
Support from other teachers	0.12 (1.00)	0.17 (0.96)	0.05 (1.05)	−0.02 (1.02)

Table A.1. Continued.

	≤10% Minority Teachers		>15% Minority Teachers	
	Minority (1)	Nonminority (2)	Minority (3)	Nonminority (4)
Parent support	2.70 (0.90)	2.73 (0.86)	2.50 (0.97)	2.37 (0.95)
Teacher characteristics				
Female	0.74	0.75	0.76	0.75
School-related yearly earnings (2011 dollars)	$54,896 ($16,942)	$55,492 ($17,020)	$55,697 ($15,703)	$56,660 ($17,013)
Union member	0.79	0.80	0.75	0.74
Years of experience	12.57 (9.35)	14.58 (9.73)	12.1 (9.32)	13.52 (9.84)
Years of tenure	7.11 (7.63)	8.74 (8.38)	6.45 (7.05)	7.11 (7.42)
Principal characteristics				
Minority	0.13	0.06	0.57	0.37
Female	0.45	0.40	0.57	0.53
Years of experience as principal	7.59 (6.83)	8.19 (7.09)	6.96 (6.37)	7.15 (6.34)
Years principal at current school	4.34 (4.47)	4.77 (4.93)	3.84 (4.28)	3.99 (4.21)
Years of teaching experience	13.23 (7.03)	12.86 (6.79)	13.33 (7.09)	13.37 (7.14)
Currently teaching	0.01	0.02	0.01	0.02
Has graduate degree	0.42	0.43	0.38	0.4
School characteristics				
% teachers of racial/ethnic minority	4.82 (3.13)	2.64 (2.98)	52.73 (25.41)	35.37 (21.02)
% students approved for NSLP	36.37 (26.56)	31.67 (23.76)	67.60 (27.68)	56.80 (28.78)
Total enrollment in school	839.30 (616.48)	737.32 (552.63)	948.63 (716.89)	976.22 (748.74)
Students per FTE teacher	15.45 (4.47)	14.91 (4.23)	15.82 (4.36)	15.93 (4.47)
% students of racial/ethnic minority	34.11 (25.77)	20.18 (21.14)	84.51 (19.66)	71.34 (25.30)
Minority student-to-teacher ratio	77.48 (94.60)	56.75 (68.02)	28.35 (16.98)	34.37 (19.81)
Charter school	0.02	0.01	0.03	0.03
Poverty rate in school ZIP Code	7.96 (6.27)	6.84 (4.98)	17.31 (10.44)	13.01 (8.99)
Share of schools by location				
City	0.23	0.14	0.54	0.46
Suburb	0.40	0.36	0.27	0.30
Town	0.13	0.17	0.08	0.09
Rural area	0.24	0.33	0.11	0.15
% Schools by level				
Elementary	0.61	0.62	0.68	0.63
Secondary	0.35	0.33	0.27	0.33
Combined	0.04	0.05	0.04	0.05
Number of observations	4,000	79,890	11,990	18,240

Notes: Data for 21,860 public schools. The sample includes teachers from the 1999, 2003, 2007, and 2011 waves of the SASS who remained in teaching the following year. Standard errors are shown in parentheses. The statistics are calculated using SASS teacher weights. The sample sizes are rounded to the nearest 10. FTE = full-time equivalent; NSLP = National School Lunch Program.

Table A.2. Factor Loadings from Principal Component Analysis

	School Support	Administrative Support	Teacher Support
Supportive administration	0.38	0.51	
Principal enforces rules	0.39	0.50	
Principal communication	0.41	0.51	
Staff recognized	0.40	0.48	
Teachers enforce rules	0.36		0.57
Colleagues share beliefs	0.32		0.59
Cooperation	0.37		0.58
Eigenvalue	3.74	2.7	2.01
Cronbach's α	0.85	0.84	0.74

Note: The reported results are for the first factor from separate models.

Table A.3. Additional Coefficient Estimates from the Main Model

	(1)	(2)	(3)	(4)
Minority teacher	0.022	0.025	0.010	0.011
	(0.015)	(0.015)	(0.012)	(0.012)
Nonminority teacher × Minority principal	−0.017**	−0.017**	−0.005	−0.005
	(0.009)	(0.009)	(0.011)	(0.011)
Minority teacher × Minority principal	−0.030*	−0.030*	−0.017*	−0.017*
	(0.018)	(0.018)	(0.010)	(0.010)
Female teacher	−0.009***	−0.009***	−0.012***	−0.013***
	(0.002)	(0.002)	(0.005)	(0.005)
Female principal	0.007	0.007	0.0003	0.0003
	(0.005)	(0.005)	(0.011)	(0.010)
Female teacher × Female principal	−0.001	−0.001	−0.007	−0.007
	(0.005)	(0.005)	(0.009)	(0.009)
Teacher characteristics				
Ln(salary)	−0.008	−0.008	−0.015	−0.015
	(0.006)	(0.006)	(0.011)	(0.011)
Union member	−0.007**	−0.007**	−0.003	−0.004
	(0.003)	(0.003)	(0.005)	(0.005)
Tenure	−0.002***	−0.002***	−0.003***	−0.003***
	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Experience	−0.005***	−0.005***	−0.005***	−0.005***
	(0.0004)	(0.0004)	(0.001)	(0.001)
Experience squared	0.00012***	0.00012***	0.00010***	0.00010***
	(0.00001)	(0.00001)	(0.00002)	(0.00002)

Notes: Additional coefficient estimates from the models in table 3.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table A.4. Multinomial Logit Results

	≤10% Minority		>15% Minority	
	Leave	Move	Leave	Move
	(1)	(2)	(3)	(4)
Nonminority × Administrative support	0.814***	0.813***	0.773***	0.820***
	(0.015)	(0.015)	(0.024)	(0.029)
Minority × Administrative support	0.952	0.689***	0.822***	0.818***
	(0.066)	(0.046)	(0.032)	(0.033)

Table A.4. Continued.

	≤10% Minority		>15% Minority	
	Leave	Move	Leave	Move
	(1)	(2)	(3)	(4)
Nonminority × Teacher support	1.004	0.950***	0.967	0.902***
	(0.018)	(0.019)	(0.031)	(0.032)
Minority × Teacher support	0.883*	1.107	0.965	0.997
	(0.060)	(0.083)	(0.036)	(0.043)
Nonminority × Parent support	0.947***	0.924***	0.946**	0.950*
	(0.019)	(0.018)	(0.025)	(0.028)
Minority × Parent support	0.995	0.845**	0.974	0.936
	(0.070)	(0.057)	(0.035)	(0.039)
N	89,440		33,250	

Notes: The base outcome is continuing to teach at the same school. The presented coefficients are relative risk ratios. All specifications include the teacher, principal, and school characteristics from the main model; indicators for teacher's education, grades, and main subject taught; and interactions between teacher and principal minority status and teacher and principal gender. State-by-year fixed effects are included as dummy variables. All errors are clustered at the state-year level.

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

Table A.5. Support and Turnover at Schools with Different Levels of Diversity

	Dependent Variable: Moved to Different School					
	(1)	(2)	(3)	(4)	(5)	(6)
Nonminority × Administrative support	−0.011***	−0.012***	−0.005**	−0.016***	−0.019***	−0.018***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Minority × Administrative support	−0.026***	−0.043***	−0.034***	−0.026***	−0.019***	−0.020***
	(0.007)	(0.011)	(0.012)	(0.009)	(0.006)	(0.003)
Nonminority × Teacher support	−0.002	−0.004**	−0.002	−0.001	−0.006**	−0.005
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)
Minority × Teacher support	0.008	0.014	0.023**	0.004	−0.008	0.005*
	(0.006)	(0.011)	(0.010)	(0.009)	(0.007)	(0.003)
Nonminority × Parent support	−0.002	−0.006***	−0.002	0.00004	−0.002	−0.001
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Minority × Parent Support	−0.011*	−0.013	−0.010	−0.009	−0.009	−0.002
	(0.006)	(0.011)	(0.010)	(0.007)	(0.006)	(0.003)
N	46,130	37,760	21,420	21,580	21,460	21,530
% Minority teachers	(0,10]	0	(0,3.85]	(3.85,8.871]	(8.871,23.0768]	(23.0768,100]

Notes: All specifications include school fixed effects and all covariates from the main models. The errors are clustered at the state–year level. The sample sizes are rounded to the nearest 10.

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.

Table A.6. Support and Turnover for Black Teachers

	Dependent Variable: Moved to Different School	
	≤10% Black	>10% Black
	(1)	(2)
Nonblack × Administrative support	−0.013***	−0.023***
	(0.001)	(0.003)
Black × Administrative support	−0.023**	−0.023***
	(0.010)	(0.006)

Table A.6. Continued.

	Dependent Variable: Moved to Different School	
	≤10% Black	>10% Black
	(1)	(2)
Nonblack × Teacher support	−0.004***	−0.0001
	(0.001)	(0.003)
Black × Teacher support	0.004	0.006
	(0.009)	(0.005)
Nonblack × Parent support	−0.004***	−0.001
	(0.001)	(0.003)
Black × Parent support	−0.024***	−0.002
	(0.008)	(0.005)
N	102,010	21,720

Notes: The specifications include school fixed effects and all covariates from the main models. The errors are clustered at the state–year level. The sample sizes are rounded to the nearest 10.

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