



The Role of Effective Principals in Reducing Teacher Turnover in Disadvantaged Schools

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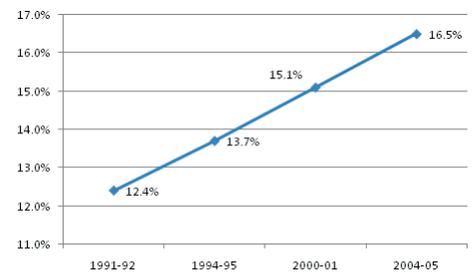
Introduction

Rates of turnover among public school teachers in the U.S. are substantial. Among all teachers, national estimates indicate that 16.5% of teachers left their schools between the 2003-04 and 2004-05 academic years, the most recent time period for which data are available.¹ Fewer than half of entering first-year teachers will remain in the same school by the end of their fifth year.

Four facts about this high rate of teacher turnover make it an important area for policy and research attention. First, data over time suggest that the trend is moving in the wrong direction. As Figure 1 shows, annual turnover rates nationally increased by 4 percentage points (or about 33%) between 1991 and 2005. Second, turnover is expensive. The U.S. Department of Labor places the cost of replacing a departed teacher at 30% of his or her salary, on average.² Excessive turnover thus diverts funds away from school budgets that could be allocated to more productive uses. Third, teacher turnover negatively impacts students. The typical school with a high rate of teacher turnover must continually replace exiting teachers with teachers who are new to the profession, which is a problem because research consistently shows that teachers are least effective at the beginning

of their careers.³ Also, constant churning among school staff promotes organizational instability and limits curricular cohesiveness across grades.⁴

FIGURE 1: ANNUAL RATES OF TEACHER TURNOVER NATIONALLY



Source: Boe, Cook, & Sunderland, 2007.

Fourth, teacher turnover is concentrated in schools with the largest numbers of minority and low-income students. In one survey of teachers in California, teachers were nearly three times more likely to report that turnover was a serious problem in their schools if the school was majority African American or Latino.⁵ Similarly, a study of teacher mobility in Texas similarly found that teachers in schools in the highest quartile of poverty were 15% more likely to turnover than teachers in schools in the lowest quartile.⁶ Given the effects of teacher turnover on student achievement, these patterns have



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* For more detail on the analysis presented here, see Grissom, J.A. (2009). *Can good principals keep teachers in the hardest-to-staff schools? Linking principals, working conditions and teacher satisfaction and turnover*. University of Missouri Working Paper.

¹ Boe, E., Cook, L., & Sunderland, R. (2007). *Trends in the turnover of teachers from 1991 to 2004: Attrition, teaching area transfer, and school migration (2007-DAR2)*. Philadelphia, PA: University of Pennsylvania.

² Alliance for Excellent Education. (2005). *Tapping the potential: Retaining and developing high-quality new teachers*. Washington, DC: Author.

³ See for example Rivkin, S., Hanushek, E., & Kain, J. (2005). Teachers, schools and academic achievement. *Econometrica*, 73(2), 417-458.

⁴ Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, 38(3), 499-534.

⁵ Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, 80(3), 44-70.

⁶ Hanushek, E., Kain, J., & Rivkin, S. (2004). Why public schools lose teachers. *Journal of Human Resources*, 39(2), 326-354.

profound implications for equity of educational opportunity. That is, schools with the highest rates of teacher turnover are the very schools that would benefit the most from a stable staff of experienced teachers. Identifying strategies for lowering teacher turnover—both for the average school and for disadvantaged schools in particular—that are effective, politically tenable, and not prohibitively expensive is of critical importance for education policy.

In pursuit of this goal, I conducted an analysis of national data from the Schools and Staffing Survey (SASS) and Teacher Follow-up Survey (TFS), both products of the National Center for Education Statistics, to better understand the factors that influence public school teachers' satisfaction and turnover decisions. In particular, I sought to examine the impact of working conditions (quality of school facilities or availability of school resources, e.g.) on teacher work decisions and the degree to which differential working conditions in schools with large numbers of disadvantaged students might drive the relationship between student characteristics and teacher turnover.

A large body of work in public administration suggests that organizational management is central to worker job satisfaction and retention, yet most prior studies of staff turnover in schools have ignored the role of the principal as a determinant of teacher working conditions. Thus, the effectiveness of the school principal was a key variable considered in this study.

SASS and TFS are nationally representative companion surveys that track teachers over two-year increments. The data sets allow for the pairing of comprehensive data on teacher attitudes, demographic characteristics and practices to information (collected by SASS) on their work decisions in the following year (collected by TFS), allowing the analyst to observe one-year turnover for most teachers. The analysis presented here takes advantage of data from approximately 31,000 regular full-time teachers in 6,300 non-charter public schools nationwide.⁷

Traditionally Hard-to-Staff Schools Differ from Other Schools

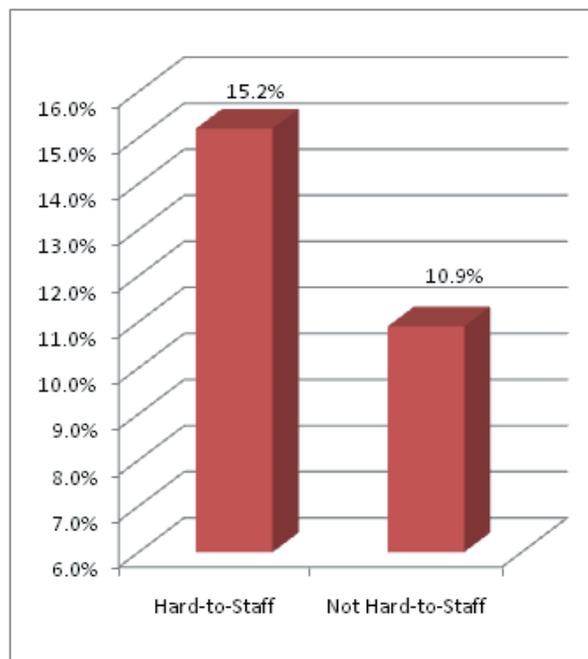
The first step in this investigation was to examine whether schools traditionally facing the greatest staffing challenges, i.e. those with the largest numbers of disadvantaged students, systematically differ from other schools. To facilitate this investigation, a school was defined as traditionally hard-to-staff if it fell into the highest quartile of fraction black students, fraction Hispanic students, or fraction of students

eligible for free or reduced-price lunches, a common marker for student poverty. Three categories of variables were considered: basic school characteristics, characteristics of the teachers, and measures of school working conditions.

There are large differences in the kinds of schools that meet this hard-to-staff definition and the kinds of teachers they employ. Hard-to-staff schools disproportionately are larger and more likely to be located in urban areas. In fact, over 60% of urban schools fall into this category, compared to approximately 30% of suburban and rural schools. Their teachers are seven times more likely to come from racial minority (black or Hispanic) groups themselves and somewhat less likely to hold regular teaching certificates or Master's degrees. Also, their average teaching experience is lower (12.8 years vs. 14.1 years).

Unsurprisingly given previous research, teachers in hard-to-staff schools report lower job satisfaction (3.4 vs. 3.6 on a 4-point Likert scale), and they are substantially more likely to leave their positions after one year. One-year turnover rates in the hard-to-staff schools are approximately 15%, compared to 11% in the comparison schools. These four percentage points translate into a 36% differential. As a result, disadvantaged schools have larger numbers of first-year teachers: 7.3% of the teaching workforce, compared to just 5.5% in non-hard-to-staff schools.

FIGURE 2: TEACHER TURNOVER RATES FOR HARD-TO-STAFF AND OTHER SCHOOLS



Source: Author's calculations.

⁷ Note that this sample does not represent all public school teachers; thus the turnover estimates presented here will differ from the ones presented in Figure 1, which included data from part-time teachers, long-term substitutes, and charter school teachers, all of whom have higher turnover probabilities than the regular full-time non-charter teachers analyzed here.

Differences in Working Conditions for Hard-to-Staff Schools

Significant differences in working conditions for teachers also were observed between the two types of schools. Multiple measures were considered, including salary, average class sizes, administrators and professional staff per student, fraction of school capacity in use, and library books per student. I also measured quantity of professional development and whether it was in the subject area taught. Teacher survey responses were used to measure degree of cooperation among staff, the amount of policy influence the teachers have within the school, and the amount of support teachers receive from parents. Each of these measures was averaged at the school level to mitigate the concern that individual teacher evaluations might be influenced by teacher satisfaction. An index of principal effectiveness also was created using factor analysis based on six evaluative responses given by teachers regarding their principals. These included responses to such statements as “The principal lets staff members know what is expected of them,” and “The principal enforces school rules for student conduct and backs me up when I need it.” This index was analyzed for reliability, standardized and, again, aggregated to the school level.

TABLE 1: DIFFERENCES IN TEACHER WORKING CONDITIONS BETWEEN TRADITIONALLY HARD-TO-STAFF AND OTHER SCHOOLS

| | Hard-to-Staff | Not Hard-to-Staff |
|--|---------------|-------------------|
| Principal effectiveness (average) | -0.04 | 0.04** |
| Average class size | 14.88 | 14.48** |
| Administrators per student | 0.004 | 0.003*** |
| Professional support staff per student | 0.004 | 0.003*** |
| Fraction building capacity filled | 0.867 | 0.834*** |
| No library in school | 0.046 | 0.026** |
| Library books per student | 21.22 | 25.66*** |
| Average workshops attended (last 12 months) | 4.05 | 3.53*** |
| Fraction of teachers that did some professional development in subject taught in last year | 0.86 | 0.83*** |
| Staff cooperation (average) | 3.22 | 3.27*** |
| Teacher policy influence (average) | -0.099 | 0.092*** |
| Parental support (average) | 2.45 | 2.85*** |
| Teacher base salary (\$), all teachers | 43986 | 44422 |
| Teacher base salary (\$), first-year teachers only | 33629 | 32482* |

Asterisks indicate statistically significant differences at the * 0.10-level, ** 0.05-level, and *** 0.01-level.

Table 1 displays differences in working conditions between the two school types. Consistent with the hypothesis that differences in working conditions may drive the associations between student characteristics and teacher satisfaction and turnover, schools with large numbers of disadvantaged students fare worse on many measures. Their classes are larger, their schools have less free space, and they are less likely to have a library. Disadvantaged schools have fewer library books per student. They also report less staff cooperation, less school policy influence for teachers, and less support from parents. In addition, hard-to-staff schools systematically are supervised by lower-rated principals.

There are three areas in which teachers in hard-to-staff schools appear at first blush to do better than their colleagues in other schools. The first is in the area of administrators and professional staff per student, of which they employ substantially more. While larger administrative and support staffs may be resources for teachers that provide them with assistance, they also may be indicative of greater bureaucracy, which previous work has linked to greater dissatisfaction.⁸ The second is professional development. Teachers in hard-to-staff schools receive more professional development as measured by workshops attended and are more likely to report doing professional development directly in their subject areas. The third is teacher pay. While there are not differences in average base salary across the two school types, this average does not take into account that teachers in hard-to-staff schools have less experience and less education, both of which determine pay on the single salary schedule. When base salary is compared for first-year teachers only, it becomes apparent that teachers in hard-to-staff schools make about \$1,150 per year more than similarly situated teachers in other schools. Though not shown, similar differentials occur throughout the teaching career.

Do Principal Effectiveness and Other Working Conditions Explain Teacher Satisfaction and Turnover?

While teachers in schools with the largest numbers of minority and low-income students make larger salaries, the higher turnover rates in these schools suggest that these pay differences are too small to compensate them for the less desirable working conditions they face in those schools. Previous work has suggested that while pay is important to teachers, it may not be as important as characteristics of the school environment.⁹ As a result, estimates of how much pay would have to be increased to keep teachers in the hardest-to-staff schools have been prohibitively high for most districts.¹⁰

⁸ Eller, W., Doerfler, C., & Meier, K. (2000). *Teacher turnover in Texas: Problems and prospects*. College Station, TX: Texas A&M University.

⁹ Horng, E. (in press). Teacher tradeoffs: Disentangling teachers' preferences for working conditions and student demographics. *American Educational Research Journal*.

¹⁰ See for example Imazeki, J. (2004). *Teacher salaries and teacher attrition*. *Economics of Education Review*, 24(4), 431–449.

If differences in working conditions are driving teacher satisfaction and turnover in significant ways, however, there is good news for schools and districts, since many of these variables can be targeted at the local level without (necessarily) large investments of funds. To evaluate the degree to which working conditions matter for satisfaction and turnover—apart from the impact of student and teacher characteristics—a series of satisfaction and turnover models were estimated using standard multivariate regression techniques. An important feature of these models was the inclusion of a district fixed effect, which holds constant all unobserved characteristics of the school district in which the teacher works. This rigorous design intentionally makes comparisons between schools within the same district.

Selected coefficients from these regressions are shown in Table 2. School characteristics, such as level and location, and teacher characteristics, including race and education level, were included in the analyses but omitted from the table.

Three regressions each for satisfaction and turnover were run. The results are similar for the two variables. In Table 2, the

first and fourth columns show the results of including school and teacher characteristics but not working conditions, first for satisfaction, then for teacher turnover. As expected, for both dependent variables there are negative relationships between the fraction of African American, Hispanic and free or reduced lunch students and teacher satisfaction and retention. All three variables are statistically significant in the satisfaction regression, while only fraction African American is significant in the turnover regression. In general, however, these results are consistent with the conclusion that teachers are more dissatisfied and more likely to leave schools with larger disadvantaged populations.

The second and fifth columns add the average principal effectiveness score as an explanatory variable. There are two important conclusions to draw from these two models. First, principal effectiveness is an important predictor of both satisfaction and turnover. A one standard deviation increase in the principal effectiveness score is associated with a gain of about one-fourth of a point (one-third of a standard deviation) on the four-point satisfaction measure. This increase in effectiveness also is associated with a 1.4 percentage point decrease in the probability that a teacher

TABLE 2: TEACHER SATISFACTION AND TURNOVER AS A FUNCTION OF PRINCIPAL EFFECTIVENESS AND OTHER WORKING CONDITIONS (SELECTED COEFFICIENTS)

| Dependent Variable: | Teacher Satisfaction | | | Teacher Turnover | | |
|--|----------------------|-----------|-----------|------------------|-----------|----------|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| Fraction black students | -0.400*** | -0.289*** | -0.267*** | 0.154*** | 0.135*** | 0.076* |
| Fraction Hispanic students | -0.427*** | -0.285*** | -0.219 | 0.057 | 0.047 | 0.039 |
| Fraction free/reduced price lunch students | -0.188** | -0.141** | -0.088 | 0.030 | 0.038 | 0.017 |
| Working Conditions | | | | | | |
| Principal effectiveness | | 0.249*** | 0.186*** | | -0.014*** | -0.012* |
| Average class size | | | -0.004 | | | -0.002 |
| Administrators per student | | | -1.947 | | | -1.053 |
| Professional support staff per student | | | 1.988 | | | -0.913 |
| Fraction building capacity filled | | | -0.183*** | | | -0.008 |
| No library in school | | | 0.025 | | | -0.069 |
| Library books per student | | | 0.001** | | | -0.000 |
| Average workshops attended (last 12 months) | | | 0.017* | | | -0.001 |
| Fraction of teachers reporting in-subject PD | | | -0.062 | | | -0.018 |
| Staff cooperation (average) | | | 0.144*** | | | -0.027** |
| Teacher policy influence (average) | | | 0.033** | | | 0.005 |
| Parental support (average) | | | 0.098*** | | | -0.023** |
| In (Teacher base salary) | | | 0.028 | | | -0.015 |
| Constant | 3.806*** | 3.787*** | 2.876*** | 0.102*** | 0.101 | 0.483 |
| Observations | 345000 | 34070 | 31340 | 34410 | 33980 | 31250 |
| R ² | 0.234 | 0.262 | 0.270 | 0.232 | 0.227 | 0.224 |

Models include district fixed effects. Some school and teacher characteristics not shown. Estimates adjusted using SASS probability weights. Sample sizes rounded due to NCES non-disclosure rules. Asterisks indicate statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

turns over, which is large given that average turnover is 13% for this sample. Second, including principal effectiveness as an explanatory variable attenuates the coefficients on the race and poverty variables. For example, the coefficient on fraction African American students in the satisfaction models falls from -0.40 to -0.29, a decrease of 28%. While the variable is still statistically significant, the inference to be drawn is that a significant portion of the observed relationship between the fraction of black students in a school and teacher dissatisfaction can be attributed to the relatively less effective principals that are allocated to schools with large numbers of black students. A similar pattern holds for turnover.

The third and sixth columns include the other working conditions measures. The coefficients on student characteristics attenuate further; in fact, student poverty no longer is statistically associated with teacher satisfaction when working conditions are included. Turnover shows no significant relationship with fraction Hispanic or fraction free or reduced lunch, and the coefficient for fraction African American is just one-half the size it was when no working conditions variables were included.

Note, however, that while the working conditions variables are jointly significant in both columns 3 and 6, few of the variables are independently significant, particularly in the turnover regressions. The two notable exceptions are staff cooperation and parental support, both of which are strongly associated with greater satisfaction and a greater probability that a teacher stays in the school next year. Teacher base salary is not statistically significant, but this result is a by-product of the district fixed effects modeling strategy and should not be interpreted to mean that pay does not influence satisfaction or turnover.¹¹

Principal Effectiveness Matters Even More in Hard-to-Staff Schools

Given the large impact of principal effectiveness on the satisfaction and turnover decisions of teachers, next I investigate the degree to which this association may be stronger or weaker in the most disadvantaged schools. In schools with lower quality working conditions, perhaps the importance of principal effectiveness is magnified, with strong principals finding intangible ways to support and reward teachers who must work in more difficult environments.

To test for a differential effect, I estimate a version of the main regressions that replaces the student demographic characteristics with the hard-to-staff variable created for the differences-in-means analysis shown in Table 1, then

includes other school and teacher characteristics, principal effectiveness, and an interaction between the principal measure and the hard-to-staff variable. A statistically significant coefficient on the interaction term would indicate that principals have differential impacts on teacher satisfaction and work decisions across hard-to-staff and non-hard-to-staff schools.

TABLE 3: DIFFERENTIAL PRINCIPAL EFFECTS IN HARD-TO-STAFF SCHOOLS

| | <i>Dependent Variable:</i> | |
|---|----------------------------|------------------|
| | Teacher Satisfaction | Teacher Turnover |
| Hard-to-Staff | -0.158*** | 0.029** |
| Principal Effectiveness | 0.216*** | -0.002 |
| Hard-to-Staff x Principal Effectiveness | 0.059** | -0.020* |
| Constant | 3.399*** | 0.329 |
| Observations | 34640 | 34540 |
| R ² | 0.261 | 0.225 |

*Models include district fixed effects plus all school and teacher variables (not shown). Estimates adjusted using SASS probability weights. Sample sizes rounded due to NCES non-disclosure rules. Asterisks indicate statistical significance: * p<0.10, ** p<0.05, *** p<0.01.*

The results shown in Table 3 support the hypothesis. In the satisfaction regression, the interaction term is positive and significant, suggesting that principal effectiveness has a greater effect on teacher satisfaction in challenging environments than it does in other schools.

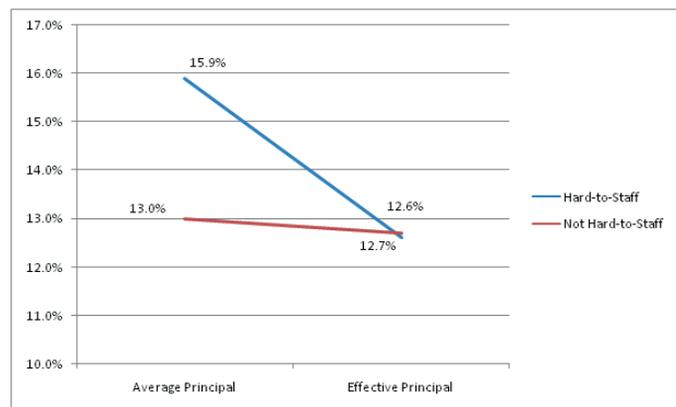
Perhaps more importantly from a policy perspective, a similar pattern is observed for teacher turnover. The interaction term is negative and significant at the 0.10-level. As with satisfaction, the coefficients suggest that teacher turnover is impacted more by the quality of the principal in a hard-to-staff school than in a non-hard-to-staff school. In fact, the size of the coefficients suggest that a moderate increase in principal effectiveness is enough to offset the turnover differential between hard-to-staff schools and other schools, as defined by student characteristics.

Figure 3 illustrates this moderating effect by defining an average principal to be one with a mean effectiveness rating and an effective principal to be one with an effectiveness rating 1.5 standard deviations above the mean. A difference of this size is large but not unreasonably large; approximately 40% of principals will fall between these two ratings. While differences in turnover in schools not defined as hard-to-staff are almost zero for the two types of principals, the differences

¹¹ The reason is that the district fixed effect holds district-level factors constant, including the single salary schedule. Within a district, any teacher's pay will be a function of experience and education, both of which are included in the model. Thus there is little variation left over with which to estimate the impact of higher pay on the dependent variables.

for hard-to-staff schools are sizable, with effective principals estimated to have teacher turnover rates approximately 3.3 percentage points lower than average principals in similar schools. This difference would be even more pronounced if a comparison was made between an effective principal and one scoring below the mean effectiveness rating.

FIGURE 3: TEACHER TURNOVER VARIES BY PRINCIPAL EFFECTIVENESS IN HARD-TO-STAFF SCHOOLS



Source: Author's calculations. Average is defined as scoring at the mean for the principal effectiveness rating variable. Effective is defined as being 1.5 standard deviations above the mean.

Discussion and Conclusion

Schools with larger numbers of minority and low-income students employ teachers with lower rates of job satisfaction and higher propensities to leave the school. This study indicates that lower-quality working conditions in disadvantaged schools explain a significant portion of these two relationships. This finding is important because it suggests that policymakers may be able to stem the exodus of teachers from hard-to-staff schooling environments by improving the work environments in those schools. Facilities quality, parental support and other working conditions for teachers are amenable to district action. Addressing working conditions may be more cost-effective than other strategies that have been suggested for lowering turnover, such as substantially increasing teacher pay.

The effectiveness of the supervising principal is especially important to teacher satisfaction and retention, particularly in hard-to-staff schools. While the observational nature of this study makes it impossible to draw causal conclusions, the analysis does suggest that a strategy of allocating the best principals to the neediest schools might be an effective strategy for

school districts to address teacher staffing challenges. Based on the descriptive analysis presented here, there is little evidence that districts systematically employ such a strategy currently.

In light of these results, future work should delve further into the connection between school leadership and teacher retention. While it is useful for policy to know that good principals matter, much more useful would be to know precisely what characteristics of principals and their management styles and characteristics predict higher satisfaction and lower turnover so that those strengths might be developed in other administrators through educational leadership programs or in-service training.

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