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The distribution and mobility of effective teachers: Evidence from a large, urban school district

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ABSTRACT

Using 7 years of student achievement data from a large urban school district in the south, this study examines the sorting of teachers' value-added effectiveness estimates by student demographics and considers factors that may contribute to such sorting. We find that students in schools in the highest quartile of minority enrollments have teachers with value-added estimates that are about 0.11 of a student-level standard deviation lower than their peers in schools in the lowest minority quartile. However, neither teacher mobility patterns nor between-school differences in teacher qualifications seems responsible for this sorting. Though the highest minority schools face higher teacher turnover, they do not disproportionately lose their highest value-added teachers, nor are teachers with high value-added systematically migrating to lower-minority schools. Instead, teachers in the highest minority schools have lower value-added on average, regardless of experience. We find suggestive but inconclusive evidence that teachers' improvement rates differ by minority-enrollment quartile.

1. Introduction

It is well-established that low-income students and students of color are disproportionately taught by teachers with weak observable qualifications, including limited experience and low academic proficiency (Betts, Rueben, & Danenberg, 2000; Clotfelter, Ladd, & Vigdor, 2005; Lankford, Loeb, & Wyckoff, 2002). However, research has also repeatedly shown that observable teacher characteristics, including experience and academic proficiency, are poor predictors of teachers' impact on student learning (Aaronson, Barrow, & Sander, 2007; Clotfelter, Ladd, & Vigdor, 2007; Rivkin, Hanushek, & Kain, 2005). As a consequence, policy attention has turned toward addressing inequities in students' access to *effective* teachers. Spurred by federal initiatives like the Teacher Incentive Fund and Race to the Top grant competitions, states and districts are increasingly focused on improving disadvantaged students' access to teachers who demonstrate high value-added as measured by their students' achievement gains

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(Denison, 2010; Sawchuck, 2011; Zelinski, 2010). What is less well-understood, however, is the extent to which the distribution of teacher value-added mirrors that of teacher qualifications. In other words, are the teachers of disadvantaged students actually less effective at raising student achievement, on average, than the teachers of more-advantaged students? The *Vergara vs. State of California* (2014) ruling, for example, which overturned California's teacher tenure statutes, drew on evidence about the sorting of teacher qualifications, but did not discuss the mixed evidence about the sorting of teachers' effectiveness in terms of value-added.

As important as understanding the extent of teacher sorting is the question of how this sorting occurs. Existing evidence suggests several possible mechanisms, even within school districts that share a common salary schedule. Insofar as teachers prefer to teach students who receive more academic support outside of school, schools serving more-affluent or advantaged students may have a larger pool of teacher applicants and thus be able to select those who at least appear most qualified. Moreover, within-district transfer restrictions that favor teachers with more seniority may exacerbate this pattern (Boyd et al., 2010). Second, if more-advantaged schools have lower turnover, as numerous studies have suggested (Falch & Strom, 2005; Feng, 2010; Hanushek, Kain, & Rivkin, 2004; Scafidi, Sjoquist, & Stinebrickner, 2007), they may be able to identify hiring needs more quickly and thereby select teachers earlier in the year, again yielding greater access to the strongest applicants (Liu & Johnson, 2006). In addition, more-affluent or well-resourced schools may provide better opportunities for mentoring and professional growth (Johnson et al., 2005), creating an environment in which teachers improve more rapidly over time (Sass et al., 2012).

In this paper, we use 7 years of teacher–student linked panel data from a large, urban district in the southern United States to examine not only the distribution of teacher value-added by school demographics, but also the relationship between teachers' value-added and their probability of leaving their current school, as a function of school demographics. In addition, we examine the extent to which higher-value-added teachers who change schools within the district move to schools with a smaller share of minority students. We find that teachers in schools with a higher share of minority students have lower value-added estimates than their counterparts, but that teacher mobility patterns do not seem to be driving this pattern. Moreover, among teachers who switch schools, we find little evidence that value-added is linked to characteristics of the destination school relative to the sending school. Cross-sectional comparisons within year suggest no differential experience effects by minority enrollment quartile, though longitudinal models suggest that improvement rates may differ among quartiles.

1.1. Background and context

1.1.1. Evidence about the sorting of teacher value-added

As noted above, studies in numerous settings have found that *teachers' qualifications*, such as their experience, standardized test scores, licensure test pass rates, preparation experiences, and college competitiveness, are not equally distributed among schools, and that schools serving a larger share of poor, minority, or low-performing students are often staffed by teachers with weaker qualifications along some or all of these dimensions (Betts et al., 2000; Clotfelter et al., 2005; Clotfelter, Ladd, Vigdor, and Wheeler, 2007; Lankford et al., 2002; Loeb & Reininger, 2004). Yet studies that have estimated the relationship between teachers' value-added have found sorting patterns that are less stark and more diverse than the qualifications literature might suggest.

In a study of elementary school teachers in the Los Angeles Unified School District, Buddin (2010) found that a difference of one standard deviation in school achievement levels corresponded to a difference of about 0.04 of a standard deviation in average teacher value-added, suggesting very small average differences among schools.

In a two-state study, Sass, Hannaway, Xu, Figlio, and Feng (2012) examined the sorting of teacher value-added among elementary schools in Florida and North Carolina. They found an average difference of 0.02–0.04 of a standard deviation of teacher value-added between high-poverty and low-poverty schools in North Carolina, favoring the low-poverty schools. They found a similar pattern in reading in Florida, though sorting in mathematics in Florida appeared to favor higher-poverty schools. Moreover, they found that these differences were driven by a higher concentration of the weakest teachers in high-poverty schools, and that effects of experience were more positive in high-poverty than in lower-poverty schools.

Focusing also on North Carolina, but on high schools, Mansfield (2010) found that teacher value-added was modestly higher in high-achieving than in low-achieving schools, though the differences accounted for less than 1% of the variation in students' achievement levels. In a study of three districts and a charter management organization in four states, Steele, Baird, Engberg, and Hunter (2014) reported that teachers in grades 4 through 8 were sorted between schools in ways that slightly favored disadvantaged students, but within schools in ways that gave disadvantaged students less access to teachers with higher value-added. However, the particular sorting patterns varied considerably among districts.

Using data from 10 large districts across 7 states, Glazerman and Max (2011) found that students in higher-performing or higher-income middle schools had slightly better access to top-quintile teachers on average, but as in other multi-site studies, the pattern differed by district. In elementary schools, they found a similar overall sorting pattern in terms of school-level student performance, but not in terms of family income levels in the schools. An even larger study of 29 school districts across the nation showed small differences in teacher value-added favoring more-advantaged students, though patterns again varied among districts (Isenberg et al., 2013). In this case, access to high value-added teachers was found to be less equitable between than within schools, on average.

Taken together, these studies suggest that teacher sorting patterns may indeed restrict the access of students from disadvantaged backgrounds to high-value-added teachers, but perhaps less so that the evidence on the sorting of teacher qualifications would suggest. Moreover, the particularities of the sorting patterns appear to vary among districts.