

Attracting and Retaining Teachers in High-Need Schools:
Do Financial Incentives Make Financial Sense?

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Abstract: This study synthesizes what we know and do not know about policies to attract and retain teachers in high-need schools and assesses the relative cost-effectiveness of two types of policies. Research consistently shows that teacher quality is likely to be lower in schools with higher proportions of students from disadvantaged backgrounds. This pattern is likely a result of several factors but the most well-documented is teachers' mobility choices within and across districts. Although there are numerous programs across the country intended to attract and retain highly-skilled teachers in high-need schools, there is very little assessment of their effectiveness. Given the lack of evidence on specific interventions, I use the results from existing studies of teacher mobility and attrition to compare the effect of salary incentives and induction or mentoring programs. Although financial incentives are arguably the most straightforward policies for states and districts to adopt, high-need schools may be better served if policymakers and researchers devoted more attention to more cost-effective alternatives.

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I. Introduction

The distribution of educational resources has been the subject of academic, legal and political discussions for years. Much of the focus has been on the equity of resources across districts but there is a growing awareness of the inequities that also exist across schools, within districts, particularly in the distribution of teachers. For example, the federal *No Child Left Behind* Act required that all states must submit a plan for ensuring “that poor and minority children are not taught at higher rates than other children by inexperienced, unqualified, or out-of-field teachers” (ESEA, Section 1111(b)(8)(C)). Although NCLB’s ‘highly-qualified teacher’ requirements (requiring that all core subjects must be taught by a ‘highly-qualified’ teacher) have received more widespread attention, the equity plan requirement specifically recognizes that even if all teachers are highly qualified, states must remain vigilant about how novice and out-of-field teachers are distributed across schools. This concern is consistent with a growing number of studies that have now established that schools with arguably the highest needs (that is, the highest levels of students in poverty, minorities, low-performers, etc.) typically have teachers with the least experience and education and who are least likely to be certified. Although some of this variation is due to differences across districts (i.e., higher-need districts have less qualified teachers than other districts), it is becoming clear that just as much, if not more, of the variation is due to differences within districts (i.e., within districts, higher-need schools have less qualified teachers than other schools).

Concern over the problems of high-need *schools* in attracting and retaining teachers has already led a number of states and districts to adopt policies designed to entice teachers to these schools, including salary bonuses, housing assistance, and loan forgiveness. In addition, recent research has suggested that reforms to seniority-driven transfer rules are also needed (Levin,

Mulhern and Schunck, 2005). However, there has been very little assessment of these programs and little is known about their effectiveness, let alone which policies are most *cost* effective.

This study synthesizes what we know and do not know about policies to attract and retain high-quality teachers in high-need schools, and assesses the relative cost-effectiveness of different policies. In the next section, I summarize the literature on the distribution of teacher quality, measured in various ways, and use data from the Schools and Staffing Survey to illustrate the pattern on a national level. Unsurprisingly, we see a fairly consistent trend that the least qualified teachers are more likely to be found in schools with higher concentrations of high-need students. This distribution of teachers across schools has been largely attributed to teacher mobility and the problems that high-need schools have with recruiting and retaining teachers. Section III summarizes the research on teacher mobility choices, confirming that teachers, in general, are more likely to leave when they teach in schools with higher levels of disadvantaged students, although it is less clear that the teachers who move are also the most qualified. These schools also have a harder time attracting new teachers to replace those who leave. Section IV briefly explores institutional and political factors that may also contribute to the observed distribution of teachers.

The final two sections summarize what we do and do not know about policies intended to attract and retain teachers in high-need schools. Given the lack of evidence on specific interventions, I use the results from existing studies of teacher mobility and attrition to compare the effect sizes of two types of policies, salary incentives and induction or mentoring programs. Although financial incentives are arguably the most straightforward policies to adopt, this comparison suggests that high-need schools may be better served if policymakers and researchers devoted more attention to more cost-effective alternatives.

II. Distribution of teacher quality

Any exploration of how teacher quality is distributed across schools must begin with a more basic question: what do we mean by teacher quality? Much of the quantitative research has defined teacher quality by ability to improve student outcomes on standardized exams. Although some argue that there are important aspects of good teaching that may not be reflected in higher test scores (such as a teacher's ability to build students' self-esteem or personal responsibility), we do have limited evidence that a teacher's impact on student test scores is correlated with more subjective evaluations of her effectiveness (e.g., Jacob and Lefgren, 2005). Perhaps more problematic is that a teacher's ability to improve student performance on tests is often not directly observable. Instead, researchers frequently use teacher characteristics as indirect proxies for teacher quality. The National Council on Teacher Quality (2006) recently reviewed the research on the attributes of effective teachers (in terms of improving student outcomes) and concluded that the first few years of experience, subject area knowledge, a teacher's level of literacy (often measured by scores on standardized exams), and selectivity of undergraduate college are all well-correlated with teaching effectiveness, while advanced degrees and experience beyond the first few years are not. They also concluded that education courses and traditional certification may add some value but the benefits appear to be relatively small and do not justify excluding from the classroom individuals who lack these credentials. The studies included in the analysis here all use one or more of the measures that are most correlated with effectiveness.¹

¹ Arguably the best measure of teacher effectiveness is a direct measure of the impact on student performance. See McCaffrey, et al (2003) for a discussion of these 'value-added' measures. Unfortunately, the data requirements to calculate value-added measures of teacher effectiveness far exceed the capacity of all but a few states, although a number of states are currently developing data systems that may allow this type of analysis in the future.

The numerous studies documenting the distribution of teachers across schools can be categorized by the scope of their samples.² One set of studies examines the distribution of schools within one large district, such as Philadelphia (Summers and Wolfe, 1976) or New York City (Iatorola and Stiefel, 2003). Another set of studies analyzes how teachers are distributed within several large districts (Owen, 1972; Peske and Haycock, 2006). And a third set of studies analyzes the distribution across all schools within a state (Betts, Rueben and Danenberg, 2000 (California); Lankford, Loeb and Wykoff, 2002 (New York); Clotfelter, Ladd and Vigdor, 2005 (North Carolina)).³ In every study, schools with higher proportions of low-income, minority and/or low-performing students are also more likely to have higher proportions of less-qualified teachers.

Lankford, Loeb and Wykoff (2002) specifically compare the variance of teachers between regions, between districts within regions, and between schools within districts. They find that for every measure of teacher quality, variance between regions explains relatively little, and that variance between schools within districts is generally larger than the variance between districts within regions. In fact, when the New York City region is excluded, variance within districts explains over two-thirds of the total variance for most of the measures (the main exception being the competitiveness of college, for which the variance is more evenly distributed).⁴

² The studies cited here explicitly analyze the distribution of at least one teacher characteristic that captures teacher quality. I do not include additional studies, many listed in Rubenstein, Schwartz and Stiefel (2006), that examine the distribution of teacher salaries (which is largely a proxy for the distribution of teacher education and experience) or per-pupil spending across schools.

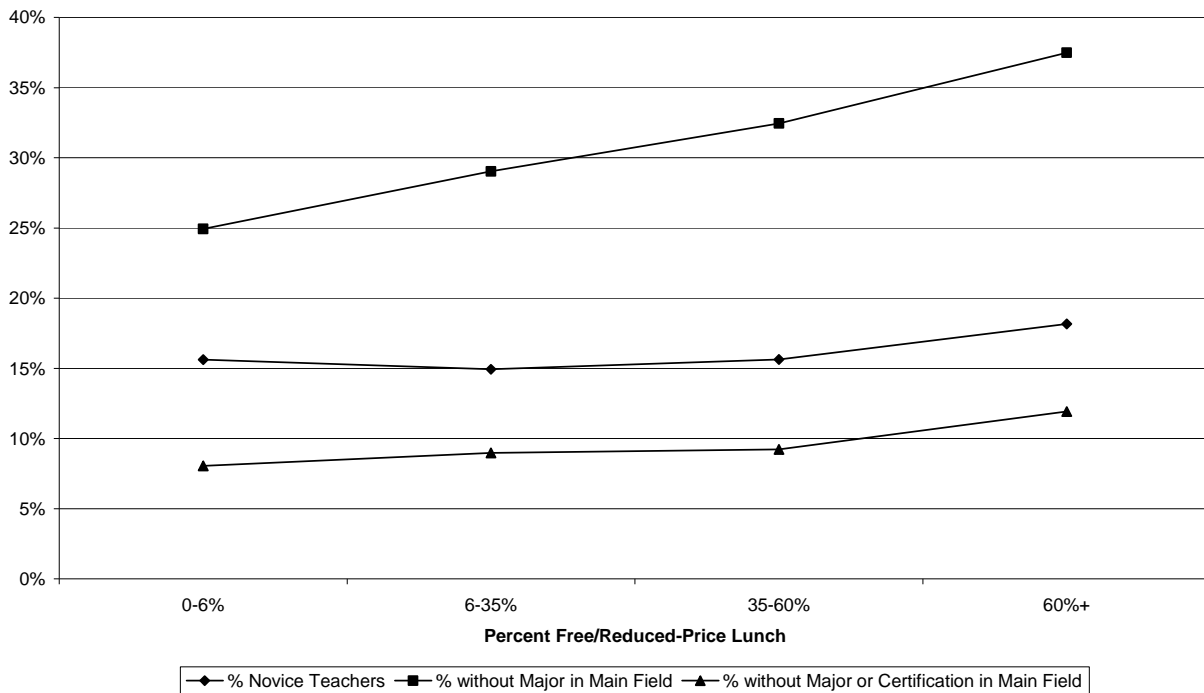
³ In addition to these studies, primarily conducted by academics and other researchers, the Department of Education required that every state submit a teacher-equity plan by July 2006. These plans were supposed to include data on teacher quality in schools with high and low proportions of poor and minority students. Unfortunately, many states' reports did not actually contain the required data (see EdTrust, 2006).

⁴ Ginsburg, Moskowitz and Rosenthal (1981) also use data from New York and find smaller disparities within districts than between districts. However, they use much coarser measures of teacher quality (i.e., median teacher education and experience) and data from 1976-77, prior to many reforms of the state's school finance system.

The Schools and Staffing Survey (SASS) can also be used to examine the distribution of at least a few teacher characteristics across the country. The SASS is a national sample of schools and teachers with data collected in 1987-88, 1990-01, 1993-94, 1999-2000 and 2003-04. The SASS surveys teachers, principals, schools and districts, and covers public, private and Bureau of Indian Affairs/tribal schools. For each wave, a Teacher Follow-up Survey (TFS) was conducted the following year and surveyed all teachers who had left their job at the end of the previous year, plus a sample of teachers who stayed.

The SASS collects data on a wide range of topics, including teacher and principal workload and perceptions, compensation, and district hiring practices, and is thus quite useful for providing a general picture of the teaching profession across the country. Although the measures of teacher 'quality' are fairly limited, the SASS does provide data on teacher experience, certification and academic preparation. For example, Lippmann, Burns and McArthur (1996) use the 1987-88 wave of the SASS and show that urban and high-poverty schools have more novice teachers (teachers with less than three years of experience) while Wayne (2002) uses the 1993-94 wave to examine the disparities in the selectivity of teachers' undergraduate colleges in high- and low-poverty schools. Figure 1 shows the distribution of novice teachers and teachers without either a major or certification in the main field of assignment, using data from the 1999-2000 wave of the SASS. Consistent with the state-level studies, teacher quality is lower in schools with the highest percentages of students in poverty, as measured with the percent of students eligible for the federal free and reduced-price lunch program.

Figure 1
Distribution of Teacher Experience and Preparation, by School Poverty
1999-2000 Schools and Staffing Survey



III. Which schools do teachers choose?

Although the research is in general agreement that the distribution of teacher quality tends to disadvantage high-need schools, it is harder to pinpoint the specific factors that drive this distribution. Certainly, the observed inequities are a result of a dynamic process of hiring, mobility, and attrition within the teacher labor market. But there are many aspects of this process, some amenable to policy influence and others less so, that may be contributing to observed differences in the characteristics of teachers across schools. Specifically, Lankford, Loeb and Wykoff (2002) suggest four plausible explanations: differences in 1) the preferences of school-area residents; 2) the efficiency of hiring practices; 3) the political power wielded by specific schools; and 4) teacher preferences. Research on the first three of these factors is fairly limited. We know much more about the role of teacher preferences and how they impact where

teachers choose to teach. In this section, I summarize the literature on teacher mobility and attrition, and first job choices; in the next section, I briefly discuss other factors that may impact the distribution of teachers across schools.

Teacher mobility can affect the within-district distribution of teachers in two ways. The most direct effect is when high-quality teachers transfer from schools with more high-need students to schools with fewer high-need students, within the same district. A more indirect effect occurs when more teachers leave relatively high-need schools for other districts or jobs, leaving these schools with more vacancies to fill (often with newer, less-qualified teachers). The bulk of the research on teacher attrition and mobility focuses on teachers leaving a district and thus can only inform us about the latter, indirect effect.⁵ For comprehensive reviews of this research, see Guarino, et al (2006) and Allen (2005). These district-level studies are generally in agreement that teachers are more likely to leave schools and districts (either for other teaching jobs or for other occupations) with higher concentrations of poor, minority and/or low-performing students, with lower salaries, and with worse working conditions (e.g., less administrative or mentor support, less autonomy, etc.).

While these studies may or may not distinguish between teachers who leave for other districts and those who leave teaching entirely, they cannot account for teachers who switch schools within a given district. Fortunately, a small, and growing, number of studies specifically analyze teacher movement within districts. Lankford, Loeb and Wyckoff (2005) focuses on

⁵ This focus is due partly to data restrictions (i.e., state-level administrative data on teachers may only allow researchers to follow teachers when they switch districts but not when they switch schools within a district), and partly to an interest in district-level policy variables such as salaries (i.e., many of these studies are interested in identifying whether teachers are responsible to salary differences but since most districts pay teachers on a district-wide salary schedule, there is very little within-district salary variation for teachers with a given level of education and experience).

transfers within New York City⁶ while Lankford, Loeb and Wyckoff (2002), Hanushek, Rivkin and Kain (2004), Feng (2005), and Scafidi, Sjoquist and Stinebrickner (2007) utilize data from all schools in New York, Texas, Florida and Georgia, respectively. Finally, Shen (1997), Ingersoll (2001) and Luallen (2006) use the Schools and Staffing Survey to examine school-level transfers in a national sample (although no distinction is made between transfers within or between districts). As with the research on *inter*-district mobility, these *intra*-district studies also are in general agreement on certain behaviors. Specifically, relative to teachers who stay, teachers who move to different schools within the same districts are more likely to have started in schools with higher levels of poor, minority and/or low-performing students. Not surprisingly, teachers who transfer then generally move to schools with lower percentages of these student characteristics.

Most of the afore-mentioned studies compare the characteristics of the schools or districts out of which teachers transfer, to the schools or districts where teachers stay. Thus, those studies do not provide direct evidence that teachers move from higher-poverty schools to lower-poverty schools but indicate that teachers in higher-poverty schools are more likely to transfer than teachers in lower-poverty schools. This would not necessarily worsen the distribution of teacher quality if, for example, teachers simply moved to other high-need schools. These studies also have little to say about the quality of teachers who move. Note that in order to claim that teacher mobility worsens the within-district distribution of teachers, we must know 1) whether higher-need schools are losing more teachers to lower-need schools *and* 2) that the teachers who leave are of higher quality than their replacements.

⁶ Murnane (1981) and Greenberg and McCall (1974) also analyze teacher movement within a single large district; however, the data used in those studies is now over three decades old. Given the changes in the teacher labor market and educational reforms across the country, it is likely that their findings are not as applicable today and I exclude them from this discussion.

As evidence of the first condition, Lankford, Loeb and Wyckff (2002) and Hanushek, Rivkin and Kain (2004) specifically compare the characteristics of the schools that teachers in New York and Texas (respectively) move to and from, and find that teachers who transfer *do* generally move to schools with fewer students who are poor, minority and/or low-performing. However, whether the teachers who move or exit are higher quality than their replacements is less clear. Boyd, Lankford, Loeb and Wyckoff (2005a) find some evidence that in New York, more-qualified teachers *are* more likely to leave teaching or move between schools and districts. However, in more recent analysis using value-added measures, Boyd, et al (2007) find that teachers who transfer within New York City actually are somewhat *less* effective than those who do not move. It is unclear whether the discrepancy arises because of the difference in the teacher quality measures used (the earlier work used teacher characteristics such as scores on the New York certification exam while the later work uses value-added measures of teacher quality), or the difference in the sample (the earlier work included all teachers in New York while the later focused only on New York City and used a more recent time period). The story is complicated even further when, in the later work, the authors also find that among teachers who do transfer, those who are less effective are more likely to move to schools with higher concentrations of minority and low-performing students.

Using the limited teacher quality measures in the SASS, the 2000-2001 Teacher Follow-up Survey indicates that teachers who move within a district are more likely to be novice teachers, and less likely to have a major or certification in their main teaching assignment or to have attended a selective college, relative to teachers who do not move. On the one hand, this might mean that teachers who transfer to other schools in the same district are somewhat less qualified than teachers who stay put. On the other hand, these data are also not inconsistent with

the often-heard complaint that hard-to-staff schools serve as ‘training grounds’ for new teachers (who may be more qualified by other measures) who then leave as soon as they are able.

Whether teachers who leave are significantly better or worse than teachers who stay, they must be replaced. In higher-need schools, the replacements are more likely to be novice teachers (since fewer experienced teachers wish to transfer in). The net impact of turnover on the distribution of teachers will thus also depend just as much on the quality of new incoming teachers who are hired. Indeed, Boyd et al. conclude that while teacher mobility does contribute to the skewed distribution of teachers across schools, it is secondary to the initial matching of teachers and schools. In related work, Boyd et al. (2005b) focus specifically on the first jobs of teachers and find that teachers show a strong geographic preference in where they choose to work. In particular, New York teachers tend to take jobs within 20 miles of where they went to high school. There is also a connection to the area where they attended college, though the link is much weaker. When teachers do take jobs far from where they grew up, they still work in familiar environments; for example, a teacher who grew up in the suburbs is far more likely to take a job in a suburban district than one in an urban setting. These geographic preferences are not necessarily unique to teachers; people in many occupations end up working in relative proximity to where they grew up. But because the need for teachers is geographically distributed more equally than other occupations (e.g., computer programmers may be able to ‘cluster’ in certain areas but schools must be everywhere), and urban districts are generally larger and employ more teachers than other districts, the end result is that urban and rural districts have a harder time recruiting teachers.

Reininger (2006) extends the New York work by using the National Educational Longitudinal Study of 1988 to explore geographic preferences in a national sample and shows

that this not a New York phenomenon. Reininger also establishes that teachers are more likely than other college graduates to stay local and these preferences further disadvantage students in the highest-need locations. However, neither study examines whether these preferences differ for teachers of different quality. If high-quality teachers are more or less likely to move farther, this could mitigate/exacerbate the distribution of teacher quality.

IV. Additional Factors in the Distribution of Teachers

The studies discussed in the previous section have consistently found that schools with the highest levels of poor and non-white students have the hardest time recruiting and retaining teachers. This undoubtably contributes to the skewed distribution of teacher quality within districts. Note that this does not necessarily mean that teachers are responding directly to student characteristics; teachers need not be transferring out of high-poverty schools because they simply don't like poor children. Student characteristics may well be correlated with other aspects of the job (such as low administrative support or crumbling buildings) that drive teachers away but that are unobservable or omitted from analyses.

It is also important to keep in mind that although teacher choices clearly contribute to the inequitable distribution of teacher characteristics across schools, they are only one part of the story. Although more research on these issues is sorely needed, a small number of recent studies have highlighted the importance of the institutional and political roadblocks that prevent high-need schools and districts from staffing their schools with the high-quality teachers they require. The work reviewed in the previous sections suggests that teachers prefer to work in schools with fewer high-need students. To the extent that district hiring and assignment policies make it easier for teachers to act on those preferences, there may be larger disparities in the distribution

of teachers across schools. For example, a recent report from the New Teacher Project (Levin, Mulhern and Schunck, 2005) examines union contract provisions and their contribution to the staffing problems in several urban districts. One interpretation of their findings is that transfer and reassignment policies can worsen inequities within districts because they allow teachers who may start out at high-need schools to then transfer to other positions in the district (though, as discussed previously, it is not clear that these transferring teachers are always more effective than those who stay).

These transfer regulations also disadvantage high-need schools in how they affect the timing of hiring new teachers. In an earlier report (Levin and Quinn, 2003), NTP researchers surveyed a handful of urban districts and discovered that these districts are often waiting until late in the summer (or even after the beginning of the school year) to make hiring offers, largely because of state and district policies that slow down the process. This is consistent with national data as well: according to the 1999-2000 Schools and Staffing Survey, in schools with the highest proportions of students in poverty, 47.1% of all newly hired teachers are hired in the second half of the summer or after the beginning of the school year; this drops to 41.7% in schools with the lowest proportions of students in poverty. This late hiring can lower the overall quality of new hires in these districts because the most qualified individuals drop out of the applicant pool earlier, as they are more likely to have attractive alternatives. Furthermore, Liu and Johnson (2006) point out that late hiring not only affects the district's ability to hire the most qualified individuals, but among teachers who *are* eventually hired, late hiring compromises a teacher's ability to find a school that is a good fit, which in turn can lead to higher turnover.

Levin and Quinn (2003) highlight three specific problems that contribute to this late hiring: a) notification requirements that allow outgoing teachers to wait until far into the summer

before letting districts know that they will not be returning in the fall; b) the timeline of state budget processes which often mean that districts do not know their budget allocations until July or later; and c) within-district transfer rules that give incumbent teachers first priority for openings. This last issue may be particularly salient for the distribution of teachers within districts; only 71.2% of principals in high-poverty schools feel that they have “a great deal of influence” over the hiring of new teachers in their schools, compared to 83.2% for principals in more affluent schools.

However, recent work by Koski and Horng (2007) suggests that transfer policies may not be a problem in all districts. Using data from union contracts in a large sample of California districts, Koski and Horng do not find that the restrictiveness of transfer rules (in terms of how much preference must be given to internal candidates) has any measurable impact on the distribution of novice or credentialed teachers within districts. This result is clarified in follow-up interviews with human resource administrators: in many districts, administrators follow the letter of the contract language but have found ways to get around the contract provisions and still staff schools as they see fit. While this would seem to contradict the conclusions of the New Teacher Project, the two studies are not entirely inconsistent in that the California districts where administrators still considered the contracts most binding were large urban districts, similar to the districts in the NTP study. Thus, it may be that while contract provisions do not pose a constraint for the majority of districts, they may still be exacerbating problems with teacher quality in the large districts that educate the majority of the most disadvantaged students.

It is also important to note that when states or districts attempt to make changes to internal policies governing the placement of teachers, they are often met with resistance from either teachers unions or parents (or both). For example, California recently passed legislation to

give principals in low-performing schools the power to stop bad teachers from transferring into their schools. Although the legislation passed, it was strongly opposed by teachers' unions (Rauh, 2006). Prince (2002a) lists several additional examples from districts across the country where attempts to change teacher transfer policies were met with stiff union resistance.

V. Policy responses

The research discussed in the previous sections makes it clear that the distribution of teacher quality across schools, and particularly within districts, is the result of a complex and multi-faceted process. It follows that if policymakers hope to equalize the distribution, it will require reforms on multiple fronts. Schools and districts not only need the resources to create incentives for teachers to *choose* high-need schools, but they also need reforms in the institutions and environments within which teachers work.

Several states, and many more individual districts, have already adopted policies aimed specifically at attracting and retaining teachers in high-need schools (see Loeb and Miller, 2006; and Prince, 2002b). Unfortunately, the effectiveness of these policies has rarely been analyzed directly. In this section, I discuss the policy options and review what we do, and do not, know about their efficacy. Although there are numerous policies that can have some impact on recruitment and retention of highly-qualified teachers overall (such as programs to encourage individuals to choose teaching as a career), I focus here on policies targeted at attracting and retaining teachers in high-need schools.

Financial Incentives

The most common policy variable found in the literature on teacher choices is salary. While there is general agreement that teachers *will* respond to differences in wages, the effects are fairly small. That is, in order to have a noticeable effect on teacher retention, any salary increases would have to be quite large. Moreover, since almost all districts pay teachers according to district-wide salary schedules (i.e., a given teacher's salary is the same regardless of where she teaches within the district), virtually all of the evidence on wage effects has come from studies of inter-district transfers and attrition out of the teaching profession. In the few papers that analyze school-level transfers, and conduct regression analysis that controls for student characteristics (these include Scafidi, et al, 2007; Ingersoll, 2001; Smith and Ingersoll, 2004), wage effects are never statistically significant at conventional levels. Thus, we know that large increases in salaries at the district level may slow the loss of teachers district-wide, but we do not have clear evidence how bonuses or differential salaries for teachers in specific *schools* might impact mobility within a district.

Nevertheless, at least a few states have implemented programs to give more money to teachers in high-need schools; according to Loeb and Miller (2006), in 2005 there were seven states with programs that used salary to attract and/or retain teachers in hard-to-staff schools.^{7,8} An additional twenty-two states offer targeted fiscal incentives in the form of housing assistance, tuition and/or school fee support, or loan assumption. These programs vary widely in the magnitude of the incentives, as well as in the requirements that teachers must fulfill in order to qualify. For example, some salary incentives are designed as one-time (or multi-year) bonuses

⁷ It should be noted that although many states have recently passed reforms to increase teacher salaries, many of those increases have been intended as across-the-board raises for all teachers in the state. Although such comprehensive raises may assist with attraction and retention in the state overall, it is unlikely that they will much improve the distribution across schools within the state.

⁸ The seven states with programs in 2005 were Arkansas, California, Hawaii, Kentucky, Louisiana, and New York (Miller and Loeb, 2006). Other states have also had targeted programs at other points in time but did not in 2005 (for example, North Carolina's program, assessed in Clotfelter et al, 2006, ran from 2001-02 to 2003-04).

while others permanently increase a teacher's base pay; some are only for teachers in shortage subject areas or for teachers who agree to a minimum amount of time in the high-need school; and some states define hard-to-staff as schools with certain student characteristics (e.g., thresholds for poverty) while others target schools based solely on performance on state accountability measures.⁹

To this author's knowledge, the only study that rigorously evaluates a specific fiscal policy designed to attract and retain teachers in high-need schools is Clotfelter, et al's (2006) assessment of North Carolina's bonus program.¹⁰ In 2001-02, North Carolina adopted a policy that promised annual bonuses of up to \$1800 to math, science and special education teachers who agreed to teach in schools with high levels of low-income or low-performing students. Clotfelter, et al, find that the program did reduce turnover rates, particularly among math and middle school teachers, and the program seems to have been particularly effective among teachers with more than ten years of experience. Furthermore, the researchers ascertained through surveys that many teachers did not fully understand the program and this may have reduced its effectiveness; for example, although the bonus remained in place for a given teacher even if the school did not remain eligible (e.g., test scores improved above the threshold performance), many teachers thought the bonus was contingent on school eligibility. This could have affected their decision to stay or transfer.

Much more research is needed to assess the effectiveness of fiscal incentive policies, especially in-kind transfers (such as housing or tuition assistance), about which we know virtually nothing. Also, the results of Clotfelter, et al, appear at odds with the research on

⁹ See Prince (2002b) for an excellent review and discussion of various types of financial incentives and the characteristics of good programs.

¹⁰ Although there are a small handful of studies evaluating other programs designed to attract and/retain teachers (such as Liu, Johnson and Peske's 2004 analysis of the Massachusetts Signing Bonus), none of those programs were specifically targeted to attract and retain teachers in high-need schools.

teacher mobility, which has found much smaller small and/or insignificant effects of salary. It may be that teachers respond differently to specific bonus programs than district-wide salary increases; for example, teachers may appreciate that the bonus program not only gives financial incentives but that it gives explicit recognition that teachers are working in a more challenging environment.

Mentoring and Induction Policies

A number of researchers have found that mentoring and induction programs have a positive impact on teacher retention. For example, Reed, Reuben and Barbour (2006) find that in California, Beginning Teacher Support and Assessment (BTSA) programs¹¹ reduced the probability of transfer and exit among new teachers in the early 1990's, while Smith and Ingersoll (2004) use data from the 1999-2000 SASS and find that mentoring and support for new teachers is correlated with a lower probability of leaving the profession. On the other hand, Smith and Ingersoll find weaker evidence that mentoring alone affects the probability that new teachers will transfer to a new school. However they note that induction 'packages' that include mentoring, collaboration with other teachers, involvement with an external network of teachers, a reduced teaching load and the assistance of a teacher's aide, substantially reduce the probability of leaving *or* transferring.¹²

Mentoring and induction may be a particularly important policy tool given that teachers in the highest-poverty schools are currently slightest less likely to have mentors or induction

¹¹ While BTSA programs vary from district to district, they are typically two-year programs for new teachers that include extra support such as counseling, assessment, and mentoring or assistance from more experienced teachers.

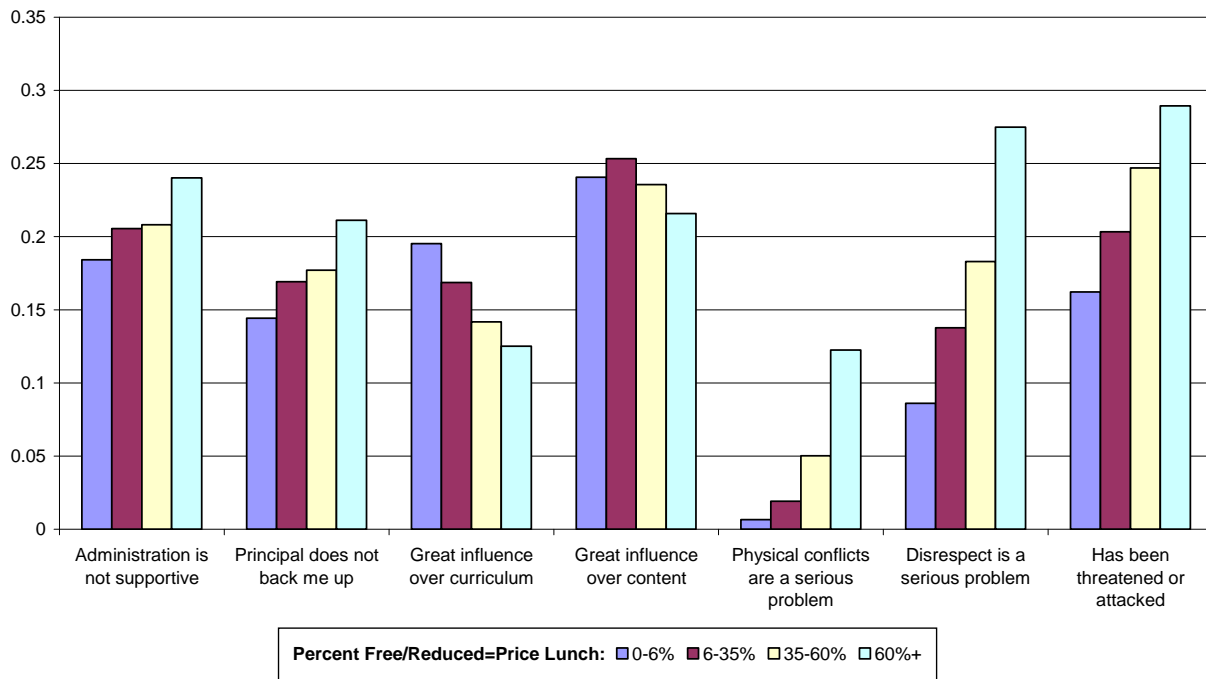
¹² It is worth noting that Luallen (2006) finds that teachers who engage in high levels of professional development activities are *more* likely to transfer to other schools in the same district, which he attributes to enhanced networking. However, his measure of professional development differs from the induction policies studied by Reed, Reuben and Barbour or Smith and Ingersoll in that it is not focused on new teachers and does not include mentoring or additional classroom resources.

programs in their first year, according to the 1999-2000 SASS. This is consistent with Johnson et al (2004), who find a large gap in the presence of mentors for new teachers in high- and low-poverty schools in Florida, Massachusetts and Michigan.

Working Conditions

The literature is very clear that teachers move away from schools with poor working conditions, such as less autonomy, higher rates of student behavioral problems and less support from administration. See Guarino, et al (2006) for an excellent summary of this research. Using data from the 1999-2000 Schools and Staffing Survey, Figure 2 shows that teachers in the highest poverty schools were more likely to disagree with statements about administrative support, less likely to feel that they have a high degree of influence over their classrooms, and more likely to see student behavior as a serious problem.

Figure 2
Teacher Assessment of Working Conditions, By School Poverty
1999-2000 Schools and Staffing Survey



Although working conditions likely play the largest role in teacher job satisfaction, it is far from straightforward to adopt policies that legislate conditions such as greater teacher autonomy and administrative support. Some states and districts are trying; for example, recent legislation in California provides significant additional resources for low-performing schools if they reduce class sizes, increase the number of school counselors, provide additional time for teachers to collaborate, and improve training for teachers and principals. Better training for principals may be particularly important since many of the complaints about working conditions could be interpreted as issues of poor leadership. However, there is little research to assess how such policies affect teacher job choices.

Hiring and Transfer Policies

The work by the New Teacher Project suggests that reforms to improve hiring practices could help disadvantaged schools. The New Teacher Project advocates removing disincentives for teachers to notify districts early of their intention to resign or retire; moving up within-district transfer timelines and reducing the preference given to internal applicants; promoting earlier and more predictable budgets, as well as protecting the highest-need schools from budget surprises; and reforming HR systems for processing applicants. Superintendents in individual districts around the country have tried to adopt some of these reforms but have generally had little success (Prince, 2002a). Most recently, in direct response to the NTP study, California passed legislation that allows principals in low-performing schools to reject teachers who want to transfer into their schools from other schools in the district. It also sets an April 15 deadline for teacher transfer decisions; after that, schools are free to hire other applicants. It will be at least a few years before we will be able to assess whether these changes have any impact on the distribution of teachers across California schools but good evaluation of these reforms seems particularly important in light of Koski and Horng's recent findings that transfer rules may actually have little effect on the distribution of teachers in most districts.

VI. Cost Effectiveness

Even without strong evidence of their effectiveness, fiscal incentive policies are popular with policymakers because they are relatively straightforward and fairly easy to legislate at the state level. But it may be that other policy options would be more cost-effective. That is, might districts be able to 'buy' better retention rates with the same amount of money spent differently? To begin answering this question, I compare the reduction in attrition among new teachers (measured by the change in the probability that a new teacher will leave a school or district)

associated with a salary increase, to the reduction in attrition associated with the adoption of an induction program for new teachers. Given the lack of evidence on the effectiveness of specific state policies (and the general lack of good data to do such analysis), I draw on existing studies of teacher mobility. The top panel of Table 1 summarizes the estimated effect of salary increases on teacher mobility from several of the studies discussed above.¹³ As noted earlier, there is very little research on teacher transfers within districts; thus, the effects shown in Table 1 apply to the probability of transfer to another district, or the probability that a teacher leaves a particular school but without accounting for where she goes (i.e., no distinction is made between inter- or intra-district transfers).¹⁴ All of the estimates are for relatively new teachers. From the table, it is clear that the effects of salary increases are quite small; on average, an increase of roughly \$4000 will only reduce the probability of transfer by at most a few percentage points (and in most cases, substantially less).

The effects of induction or mentoring, shown in the bottom panel of Table 1, are noticeably larger. Reed, Reuben and Barbour (2006) find that in California, Beginning Teacher Support and Assessment Programs, which include a variety of support services for new teachers, reduce the probability of inter-district transfers among new teachers by five percentage points for teachers with multiple-subject certifications. Ingersoll and Smith find that a basic induction program (which includes only mentoring and ‘supportive’ communication from their administrators) has no impact on transfers between schools, but when a seminar for beginning teachers and collaboration with other teachers is added in, the impact goes up to eight percentage points. When extra resources such as teacher aides and fewer course preparations are also added,

¹³ This is clearly a small and selected sample of the many mobility studies that have been done. For ease of comparison, I only include studies that a) use relatively recent data (no later than early 1990’s), b) estimate similar models (hazard or multinomial logit) and c) provide conversions of the coefficients into marginal salary effects.

¹⁴ I focus on the estimates for transfers. In some papers, the estimates for exits out of the teaching profession are larger; in others, the estimates are smaller. But in none are these differences particularly large.

the impact goes up to twelve percentage points. However, these last interventions can also add significantly to the cost.

Although the cost of induction programs varies, California's BTSA program provides a useful example. In 2005-06, the state provided \$3,675 for each first-year BTSA teacher and districts provide an additional \$2000 (typically in the form of the time that more experienced teachers spend with the new teachers). In contrast, using the same data, a salary increase of \$5675 would have a somewhat smaller impact on turnover. Although the difference in the turnover rate is only about a percentage point, the cost difference is magnified substantially when one considers that induction programs are a one-time investment per teacher, while salary increases of any magnitude are generally built permanently into a teacher's salary for the rest of her career. Even if the impact on retention is similar, the induction program appears to be the better deal.

VII. Conclusion

It is clear that the distribution of teacher quality disadvantages schools with the neediest students. It is also clear that this distribution is driven largely by teacher preferences, aided by institutional constraints that may hinder the ability of principals and superintendents to hire the people they want. What is far less clear is whether policies and reforms intended to help reduce inequities in the teacher distribution are actually effective. The Department of Education has required that all states report the "steps that the State educational agency will take to ensure that poor and minority children are not taught at higher rates than other children by inexperienced, unqualified, or out-of-field teachers, and the measures that the State educational agency will use to evaluate and publicly report the progress of the State educational agency with respect to such

steps.” (ESEA Section 1111(b)(8)(C)). But much more research is needed to determine what the most effective ‘steps’ might be. In particular, assessment of policy effectiveness requires more than a simple accounting of whether money was spent but must ask whether schools look any different *because* of the policy.

In addition to more research on the overall effectiveness of policies to attract and retain teachers in high-need schools, it is also important for researchers to consider *cost*-effectiveness. That is, when faced with several different options, it would be helpful for policymakers to understand the cost differences as well as simply whether or not they work. Salary and other financial incentives may be more straightforward than other options but it may be significantly cheaper to ‘buy’ the same results with, say, well-designed mentoring programs, better leadership training for principals or more time for teachers to collaborate.

Although the existing literature indicates that salary incentives are likely not the most cost-effective option for attracting and retaining teachers in high-need schools, there are at least two important caveats. First, almost all of the existing studies of teacher mobility and attrition identify the effect of salary by using cross-district variation in salary schedules. It is possible that teachers respond differently to differences in base salary levels than to bonuses that are specifically intended to compensate for the increased challenges associated with particular assignments. This would be consistent with the results from the North Carolina bonus program, which reduced turnover substantially more than the previous literature would have suggested. On the other hand, policies that give bonuses to individual teachers within a district are often politically more difficult to adopt, and likely more vulnerable to budget cuts, than increasing salary levels for all teachers in a district.

The second caveat is that the effectiveness of any particular policy, whether financial incentives, induction programs or any other intervention, depends critically on how it is designed and implemented. For example, the mix of services in an induction program appears to affect retention rates. Or, as discussed in Clotfelter et al (2006), the effectiveness of a bonus program may depend on whether teachers fully understand whether they are eligible. In North Carolina, there was also much skepticism that the program would be funded consistently, likely reducing the effectiveness of the program (Clotfelter et al, 2006). To maximize the return on any policy investment, policymakers should heed the lessons from other states that have adopted similar policies.

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Table 1

Author	Sample	Type of Transition	Simulated Increase in Salary	Percentage Point Reduction in Turnover
Feng, 2005, Ch. 3	1993- 2003 Baccalaureate and Beyond (national, beginning teachers)	transfer districts	\$8,000	0.18
Feng, 2005, Ch. 4	1997-2002 FL (beginning teachers)	transfer districts	\$5,000	<.001
Feng, 2005, Ch. 4	1997-2002 FL (beginning teachers)	leave school (any reason)	\$5,000	<.001
Reed, Reuben and Barbour, 2006	1991-1995 CA (beginning teachers)	transfer districts	\$4,400	3
Scafidi et al, 2007	1994-2000 GA (beginning teachers)	leave school (any reason)	\$4,674	0.88
Hanushek, Kain and Rivkin, 2004	1993-1996 TX (all teachers with controls for experience)	transfer districts	10%	1.2 (<3 yr exp) 1.1 (3-5 yrs)

Author	Sample	Type of Transition	Type of Program	Percentage Point Reduction in Turnover
Smith and Ingersoll, 2004	1999-2000 SASS (1st year teachers)	transfer schools	basic induction	no effect
			induction + collaboration	6
			full package: induction, collaboration, network, extra resources	12
Reed, Reuben and Barbour, 2006	1991-1995 CA (new teachers)	transfer districts	Beginning Teacher Support and Assessment	5