How Unique are Urban Districts' Challenges with Recruiting/Retaining Math Teachers?— A Comparison with Suburban Districts

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Research for this paper was supported by MetroMath: The Center for Mathematics in America's Cities, a Center for Learning and Teaching funded by the National Science Foundation under Grant #ESI0333753. Any opinions, finding, and conclusions or recommendations expressed in this paper are those of the authors, and do not necessarily reflect the views of the National Science Foundation. Aubrie Swan and Deena Khalil participated in this research project as MetroMath graduate student fellows. MetroMath Fellows Tom Cain and Peter Herbst also participated during the initial planning of this project.

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ABSTRACT

Previous articles that we have written describe the challenges encountered by eight urban districts in recruiting and retaining secondary mathematics teachers, as well as the strategies these districts have used to address these challenges. This paper compares and contrasts urban and suburban experiences with these issues. The three suburban districts added to the original study are located near urban districts in the sample and, thus, draw on the same pool of teachers. They also average nearly 15,000 students – the same size as some of our urban districts, so they may have some of the same advantages and disadvantages of scale that urban districts have. We expected to find that the staffing challenge to be somewhat less severe in suburban districts and for suburban districts to have certain competitive advantages in the competition for talent, and indeed much of our findings confirmed these expectations. However, expanding our analysis to include suburban districts has broadened our understanding of the mathematics staffing challenge and has revealed that many aspects of the challenge are not unique to urban settings. In the suburban districts, the staffing challenge was indeed less severe and supply of teachers was adequate, which allowed administrators to fill math positions with satisfactory candidates. However, administrators did need to worry about the quality of the math teacher pool, and did not always fill their positions with the teachers that had all of the qualities they sought. Finding appropriate teachers was challenging, but suburban administrators weren't exerting themselves as much as their urban counterparts. Our research finds four sets of factors that often exacerbate the staffing challenge in both urban and suburban districts: geography, policy factors, organizational factors, and administrators' own views of teacher quality and the unique characteristics teachers needed in order to succeed in an urban or suburban setting. Other factors, including socioeconomic status and administrators' decisions, also shaped the nature of each district's staffing challenge and influenced its capacity to meet the challenge. Together, these factors often: (1) restricted district flexibility; (2) made it difficult to hire early, when the pool was largest and of highest quality; (3) reduced districts' competitiveness in terms of hiring teachers; and (4) reduced the number of candidates who were viewed as acceptable.

INTRODUCTION

Policymakers, educational administrators, and the public all understand that the quality of the teaching force is essential to improving student achievement, and research supports this notion (Nye, Konstantopoulos, & Hedges, 2004; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004; Sanders & Rivers, 1996). Recent research has also documented large disparities between the qualifications of teachers in schools serving low-income students and students of color and those of teachers in schools serving high-income and white students (Lankford, Loeb, & Wyckoff, 2002; Peske & Haycock, 2006). At the same time, several national reports have pointed to the need to increase the pool of highly qualified mathematics teachers as a way to improve mathematics education and, thus, the United States' economic competitiveness (Glenn Commission, 2000; National Academy of Sciences, 2007). Recognition of these three facts—that teachers matter, that high quality teachers are unequally distributed among schools and students, and that there is a shortage of qualified mathematics teachers—has led to a renewed interest in how urban districts hire, support, and retain teachers of mathematics.

Staffing Challenges in School Districts

Various explanations have been offered as to why many districts are having difficulty recruiting and retaining quality teachers and, in particular, quality mathematics teachers. Some analysts argue that the level and structure of teacher pay contributes to an inadequate supply of quality candidates (Ballou & Podgursky, 1997; Hanushek, 2001; Odden & Kelley, 1997). The inability of districts to offer competitive salaries to individuals with strong math backgrounds, who have many career options, is viewed as a major problem. Another supply-side perspective holds that universities are producing insufficient numbers of individuals with strong enough mathematics backgrounds to teach math. Some policymakers and analysts in this camp argue for

strengthening mathematics teacher education and providing incentives for math students to enter teaching (National Academy of Sciences, 2007). Other analysts take a more deregulatory approach and promote the expansion of alternate routes to certification to increase supply (Thomas B. Fordham Foundation, 1999).

In contrast, another group of researchers and observers has focused on demand-side factors. Richard Ingersoll (2001) has demonstrated that high levels of teacher turnover play a major role in teacher shortages by increasing demand. This, he and others argue, is tied to organizational factors, since many of the reasons teachers leave schools or the teaching profession are related to working conditions, principal leadership style, and insufficient support (Smith & Ingersoll, 2004; Johnson et al., 2004). Support and working conditions are particularly important, because they are essential to teachers' ability to realize the intrinsic rewards that attract many to teaching and that partially compensate for low pay (Johnson & Birkeland, 2003; Liu, Johnson, & Peske, 2004; Lortie, 1975). From this perspective, greater emphasis should be placed on retaining teachers through improving the organization of schools.

Organizational issues also arise in the area of hiring and human resource systems. Some blame seniority-based transfer rights for hampering districts' ability to hire qualified teachers in shortage areas (Levin & Quinn, 2003). Others, such as Liu & Johnson (2006), Neild, Useem, & Farley (2005), and Rutledge, Harris, Thompson, & Ingle (2008), point to the ways in which districts organize hiring and the effects that dysfunctional personnel practices and late hiring have on districts' ability to recruit and retain talent. These researchers argue that improving hiring practices is a key to raising teacher quality.

Additional Challenges Facing Urban Districts

Although many districts have difficulty recruiting and retaining quality teachers, existing research suggests that urban districts face additional challenges. First, teacher labor markets are quite local in nature, and shortages of high-quality teachers are most pressing in urban, low-income districts. Boyd, Lankford, Loeb, & Wyckoff (2005) have found that teachers seem to have a preference for teaching close to where they themselves grew up (or in similar locales). This, they argue, "challenges urban districts, which are net importers of teachers" (p. 127). Second, patterns of teacher migration also work against poor, urban schools and districts. In their transfer behavior, teachers tend to migrate away from teaching poor, low-performing, and "minority" children (Hanushek, Kain, & Rivkin, 2001; Lankford et al, 2002) and toward more affluent and homogeneous schools. Third, urban districts may not be as able as suburban schools to deliver the same combination of incentives, support, and working conditions that have been demonstrated to play an important role in teachers' career decisions (Ingersoll, 2001; Johnson, 1984; Liu et al, 2004; Lortie, 1975). Thus, as Lankford et al (2002) note, based on their analysis of the teacher labor market in New York State, "From a policy perspective, urban schools confront an enormous challenge…. [They] systematically receive less qualified teachers than their suburban counterparts and many of the dynamics work to the disadvantage of urban students" (p. 55).

Although these and other studies have examined individual factors that make staffing classrooms with quality teachers difficult, relatively few have examined how individual districts experience and cope with multiple factors; fewer still have done so in the context of a serious shortage area such as mathematics. Our project has taken an organizational approach to examining the challenge of attracting and retaining quality math teachers in urban schools and

districts. We began the project by trying to understand how central office and school-based administrators viewed and understood this challenge, and what measures they were taking to address it.

In the first of two earlier papers, we presented preliminary findings about the multifaceted nature of the staffing challenge in six urban districts (Liu, Rosenstein, Swan, & Khalil, 2008). The administrators we interviewed reported that the supply of mathematics teachers was tight, demand was high, and competition with other districts for the best candidates was fierce. We also identified four sets of factors that exacerbated the staffing challenge: geography, policy factors, organizational factors, and administrators' own views of teacher quality and the unique characteristics teachers needed in order to succeed in an urban setting. Together, these factors often: (1) restricted district flexibility; (2) made it difficult to hire early, when the pool was largest and of highest quality; (3) reduced districts' competitiveness in terms of hiring teachers; and (4) reduced the number of candidates who were viewed as acceptable.

In the second paper (Liu, Rosenstein, Swan, & Khalil, 2009, submitted), we discussed the strategies that eight urban districts used to address this challenge and the combination of policy instruments that they utilized. We found that these districts adopted a range of strategies that attempted to either increase the supply of math candidates or reduce their demand for them by limiting turnover. Certain districts also attempted to make organizational changes or process improvements that would enhance their ability to identify qualified applicants, steer them to schools for which they would be a good match, and hire them quickly before other districts snapped them up. Moreover, we found that how administrators framed the staffing challenge appeared to shape the strategies they pursued.

Since those first two papers, we have extended our study to include the collection and

analysis of data from three relatively large suburban districts, each of which is located in the same greater metropolitan area as one or two of our original urban districts. We wanted to be able to distinguish between aspects of the challenge that might be unique to the urban context and those that might be due to either to regional factors or to the scale and organizational complexity of the districts.

Collecting this new data allowed us to explore the following research questions:

- What aspects of the staffing challenge are similar across the districts (though they might differ in degree), and which appear to be unique to urban districts or unique to suburban districts?
- In what ways, if any, do administrators in urban and suburban districts view and/or approach the challenge differently? If differences exist, what factors account for them?
- Do urban and suburban districts in the same greater metropolitan area experience the staffing challenge differently and, if so, how?
- Do urban and suburban districts of roughly the same size experience the staffing challenge differently and, if so, how?

The Changing Nature of Urban and Suburban Contexts

This new line of inquiry is informed by, as well as speaks to, emerging research on the changing nature of cities and suburbs. When we initiated this second stage of our study, we thought we knew that certain districts were urban and that others were suburban on the basis of location and relative affluence. However, as we began to analyze and interpret our data, we found that the dividing lines between "urban" and "suburban" were not so clear. Indeed, over the past two decades, many cities and suburbs have been transformed by what Amy Stuart Wells describes as a "pattern of 'trading places' along race and class lines and over urban-suburban boundaries [that] has shaken the 50-year-old paradigm of cities versus suburbs" (Wells,

unpublished). This pattern has three aspects: (1) The exodus of many middle class Black and Hispanic families from the cities to the suburbs that began three decades ago (Massey & Denton, 2008); (2) The more recent influx of a small but increasing number of highly skilled, affluent, and largely White professionals from the suburbs back into gentrified neighborhoods, as a number of major cities reemerged as vibrant economic centers (Sassen, 2006); and (3) The consequent displacement of lower-income people of color away from city centers to more remote urban neighborhoods or to suburbs as a result of gentrification and the rising housing costs that inevitably follow (Freeman, 2006).

One result of these demographic shifts is that suburbs have become more racially and socio-economically diverse—census data from 1990 to 2000 indicate that the percentage of suburban residents who were members of racial and ethnic minorities increased from less than 20 percent to more than 25 percent (Katz and Lang, 2003)—and suburban contexts have become more varied in character. Many suburbs no longer fit the stereotypical image of an economically and racially homogenous (i.e., white middle and upper-middle class), crime-free, idyllic bedroom community where everyone lives in a single-family house with a large yard (Jackson, 1985). Indeed, as Katz and Bradley (2009) put it, "the suburbs as we think of them are vanishing. They no longer represent a retreat from the tumult of American life, but the locus of it." Katz and Bradley point out that suburbs now provide more jobs than cities, and they house more immigrants. They also increasingly contain pockets of poverty. Indeed, "nationwide, a million more suburbanites are living below the poverty line than city dwellers" (Katz & Bradley, 2009), although this figure obscures the fact that cities still have much higher concentrations of poverty than suburbs and ignores the fact that the federal poverty line is independent of cost of living (so that, because living in a city is expensive, city dwellers who are *above* the poverty line may have

less purchasing power than suburbanites who are *below* the poverty line).

Urban centers have also become more varied in nature. Certain large cities have emerged as key nexus points of the global economy (Sassen, 2006) and beacons for highly skilled professionals and members of the "creative class" (Florida, 2004). The processes of globalization and gentrification have altered the character of many urban neighborhoods and transformed the image of many large cities (as well as some smaller ones) as places to work and live (Lees, Slayter, Wyly, 2008). Cities are increasingly seen as exciting, dynamic, and safe places to live, by upper middle class and affluent individuals, and by young and old alike. As a result, pockets of affluence have arisen in large cities. This transformation, however, has not occurred in all cities, for some urban areas have not made a smooth transition into the postindustrial, service-sector economy and still suffer from high crime, high unemployment, depopulation, and aging housing and infrastructure. Nevertheless, as Amy Stuart Wells (unpublished) notes, "It is increasingly clear that simplistic understandings of "city" versus "suburban" spaces will not hold, as *both* now contain pockets of poverty and affluence…"

The blurring of some distinctions between urban and suburban contexts has possible implications for school districts' ability to recruit and retain quality mathematics teachers. First, it raises the possibility that the mathematics staffing challenge in some suburban districts might, in fact, be more similar to the challenge in urban districts than one might initially assume. These districts may contain individual schools with large numbers of low income or minority students that have difficulty attracting teacher candidates. Moreover, the increased diversity of their student populations may lead them to screen their candidates for new sets of skills, experiences, or characteristics that they might not have deemed necessary in the past. Second, it raises the possibility that certain large urban districts might have advantages over suburban districts in

recruiting candidates with strong mathematics backgrounds, if they are situated in locations that are seen as desirable places to live. Third, the increasing diversity in suburbs may complicate the politics of education in these districts, put new pressures on school budgets, and increase the uncertainty regarding the passage of school levies and budgets. Like their urban counterparts, the public school student populations in many suburban districts include greater proportions of low income and minority individuals than the general (i.e., tax-paying) population living in the district. This paper, then, attempts to look across a number of urban and suburban districts to understand how the math challenge might vary.

DATA AND METHODS

For this study, we interviewed administrators in eight urban and three suburban districts in five northeastern states. The sample was purposive, and we were conscious of building a sample that contained urban districts of various sizes and that were situated in a variety of geographic settings.

Of the eight urban districts involved in the study, three have between 15,000 and 20,000 students (Armstrong,[1] Calloway, and Joplin), three have between 25,000 and 35,000 students (Basie, Dorsey, and Gillespie), and two have more than 40,000 students (Ellington and Hampton). In all of the urban districts but Calloway, students of color comprise the majority of students and at least 65 percent of the students receive free or reduced-price lunch. These districts are also diverse in terms of their geographic settings. Armstrong, Basie, and Gillespie are small- to mid-sized urban districts that are part of larger metropolitan areas; Hampton is similarly situated, but somewhat larger. To one side of each of these districts is a much larger

[1] Throughout this paper, pseudonyms are used in place of the actual district names. Names of great jazz musicians were used as the pseudonyms.

city/district that forms the center of the metropolitan area, and to the other sides are more affluent suburbs. In contrast, Calloway, Dorsey, and, to a lesser extent, Joplin, are more isolated geographically; they are not in areas dominated by a much larger nearby district. Finally, Ellington is a large urban district at the center of a large metropolitan area.

See Table 1 for summary information on the eight urban districts.

Table 1: Information on Urban Districts

		Armstrong	Basie	Calloway	Dorsey	Ellington	Gillespie	Hampton	Joplin
Student Population		15,000	25,000	15,000	35,000	>50,000	30,000	40,000	20,000
District Demo-graphics	% White	35	20	65	15	15	10	10	10
	% Afr.-Amer.	50	30	<5	65	45	35	60	40
	% Hispanic	10	45	30	20	30	40	30	45
	% Asian/other	<5	<8	<3	<3	10	15	<1	<5
% English Lang. Learners		<10	20	<10	<10	20	<10	<10	15
% Free-reduced lunch		65	70	35	80	75	70	80	90
Per pupil expenditures ($)		12,000	15,000	10,000	15,000	15,000	>17,000	>17,000	12,000

Note: Figures provided have been rounded to protect the identity of the districts. Yearly per pupil expenditures are for 2004-2005.

The three suburban districts (Webster, Young, and Vaughn) are quite large and each have approximately 15,000 students. They reflect, however, some of the increased variation across suburban contexts. Two of the districts serve predominately white student populations, whereas one (Young) is quite diverse, with a large Asian population. In two of the districts, fewer than 10 percent of the students are eligible for free or reduced-price lunch, whereas in one district (Vaughn) approximately 25 percent of the students are eligible.

Webster and Vaughn can be considered suburbs of two of the urban districts in our sample. Webster is an inner-ring suburb of Ellington, populated by many professional-class families attracted to the district's excellent reputation as well as the community's relatively progressive character; it is also located near Armstrong. Though it is the most affluent of the three suburbs, it does have a small lower middle class population and some racial and ethnic

diversity. Vaughn is a middle class suburb with a sizeable working class population located next to Dorsey. Young is located near both Gillespie and Hampton, though it is not considered a suburb of either—all three districts are part of the same greater metropolitan area. It could be characterized as somewhat of an "edge city" in that it is not a bedroom community and there is considerable commercial activity and jobs within its borders and in surrounding communities.

See Table 2 for summary information on the three suburban districts.

Table 2: Information on Suburban Districts

		Webster	Young	Vaughn
Student Population		12,000	15,000	15,000
District Demo-graphics	% White	75	35	85
	% Afr.-Amer.	5	10	10
	% Hispanic	5	10	5
	% Asian/other	15	45	< 3
% English Lang. Learners		5	<3	< 3
% Free-reduced lunch		<10	10	25
Per pupil expenditures ($)		15,000	15,000	12,000

Note: Figures provided have been rounded to protect the identity of the districts.
Yearly per pupil expenditures are for 2004-2005?

In each district, we interviewed the secondary mathematics supervisor(s), the director of personnel and human resources, and two or three principals. We also asked the director of human resources and the mathematics supervisor to each fill out a one-page questionnaire requesting basic information. The semi-structured, hour-long interviews were conducted over the telephone, though a small number were conducted in person. The interviews were taped and then transcribed.

In analyzing the interview data, we used contextual analysis to understand each district's experience of recruiting and retaining math teachers, as well as cross-case analysis to understand patterns and themes across the districts. As a first step, we read through the interviews and created narrative case studies of individual districts to help us understand the data in context and

to identify relationships between different elements of the administrators' experiences within a particular district. This process also helped us identify emerging themes in our data and to set up the next part of our analysis. This involved analyzing the interview data by coding and sub-coding based on themes that emerged in the case studies, from the interview data itself, and from the research literature. We then engaged in an iterative testing process, moving back and forth between the themes/hypotheses we had identified to the interview data and the case studies.

Study Limitations

Our study has certain limitations. We studied a small sample of districts located in a particular region of the country.[2] These districts agreed to participate in our study and might represent districts that are particularly well organized and open to scrutiny, though we do not possess any information suggesting that this was the case. Our study also relies on administrators' accounts—their descriptions of policies and practices, and their estimates, recollections, and informed opinions. These accounts may not fully or accurately represent some of the practices of their districts or may be based on limited information. However, we have no reason to believe that the people we interviewed were not knowledgeable or candid about their districts' practices and policies; indeed, we found them to be very knowledgeable about the issues that we were discussing with them and very willing to share with us their experiences, their frustrations, and their challenges. Moreover, we strengthened our findings by triangulating data among the multiple interviews within each district, and using later interviews to clarify ambiguities that arose in earlier ones.

[2] The Northeast and Mid-Atlantic are regions that suffer from a "considerable" shortage of math teachers (American Association for Employment in Education, 2007), compared with the more severe shortages that can be found in other, more rapidly growing regions, such as the Far West and Southeast.

Given the nature of our sample and our data, we do not make any claims that the findings reported in this article generalize beyond our sample. All of our districts, urban and suburban alike, were located in a region of the country that is quite densely populated overall. While the urban districts in the Northeast may be similar to urban districts in other parts of the country, the larger suburban districts in the Northeast may be unlike suburbs of comparable size in other parts of the country, and have denser and more diverse denizens. They may also be more likely to reflect the changing nature of suburbs discussed above. However, we do believe that our data provide a significant window into understanding and appreciating the challenges and efforts at the district level, and they do allow us to engage in theory and model building as well as point to some promising directions for practice and future research.

FINDINGS

We found many similarities between the challenges facing urban and suburban districts, but also significant differences. Like their urban counterparts, administrators in suburban districts reported that finding and hiring high quality mathematics teachers was a significant challenge. They, too, complained about the size and quality of the applicant pool. They, too, described how factors related to federal, state, and local policy, and to district and school organization further complicated the challenge of ensuring that all of their students were taught by high quality mathematics teachers. However, although the overall shortage of mathematics teachers affected both urban and suburban districts, the two types of districts experienced this shortage somewhat differently. Unsurprisingly, the staffing challenges facing the suburban districts were typically not as severe as those facing the urban districts, and these districts had certain advantages in terms of attracting highly qualified applicants.

However, differences in districts' experiences of the staffing challenge were not simply due to differences in urban or suburban status, for we found significant variation among the districts within each group. Other factors, including geographic location, socioeconomic status, and administrators' decisions also appeared to shape the nature of each district's staffing challenge and influence its capacity to meet the challenge.

I. Surface-Level Similarities and Differences: Tight Supply, Strong Demand, and Fierce Competition:

All of the administrators interviewed in our study, urban and suburban alike, reported that recruiting and retaining quality math teachers was a significant challenge. At the surface level, central office and building administrators collectively painted a picture in which supply was tight, demand was high, and competition for the most highly qualified math candidates was often quite fierce. A closer look beneath the surface, however, revealed some fairly predictable differences in the extent of the challenges that urban and suburban districts faced.

Supply – The administrators in our study were unanimous in pointing to the limited supply of highly qualified math candidates as a major (if not the main) source of difficulty in finding and hiring math teachers. Many administrators shared Dorsey's Director of Human Resources view that "the size of the supply for math teachers is too small for the size of the hiring need." Mathematics supervisors, Human Resource directors, and building principals all bemoaned the small pool of math candidates from which they had to choose. As Basie's math supervisor put it, "I don't feel that we have the choices we would like to have." These complaints were not limited to the urban administrators, and they extended to the quality of the applicants and not just the quantity. A principal in suburban Young explained:

> The quality of the people coming for positions has been, I guess, questionable. We've kept people we feel are not quite at the level we would like, because we just don't have anyone else coming forward. *[Interviewer: How about quantity, is that an issue as well?]* Yes! No, we do not get a lot of applicants. I would also say quantity is also an issue.

Though both urban and suburban administrators complained about the size and quality of the applicant pool—and especially the paucity of candidates who had a major in mathematics, university-based teacher preparation, and experience—the urban administrators reported receiving fewer applicants for their math openings than the suburban districts. Although the data and estimates we received from administrators were not as precise, complete, and reliable as we would have liked, they did provide us a general sense of the volume of applications the districts received. For the urban districts in our sample, the typical number of applicants per math opening was in the low single digits. For instance, four of the eight urban districts reported receiving three or fewer applications per math opening. The urban district receiving the highest number of applications per opening was Basie; from 2006-2008, it received approximately 8 applications per math opening, according to the Director of Personnel. Note that in each case, this was the number of people applying for the position; the number who were actually qualified, or desirable, was undoubtedly much smaller.

In contrast, two of the suburban districts appeared to have much larger applicant pools than the urban districts. For instance, Webster's math supervisor estimated receiving 70-80 applications for a math opening, though many of the applicants were not qualified or worth considering: "I would say really, really qualified, you would definitely want to read every last bit of the application? 20-25, quite a different number." A principal in the same district painted a similar picture in describing the applications she received for two math openings: "I have to say, there were literally hundreds of applicants—for the second one, there were over 100—but very,

very few were what I'd call qualified." Asked how many of these applicants were worth interviewing if s/he had unlimited time, the principal responded, "I'd say less than ten." Needless to say, her district had more applications from qualified teachers than the urban districts had from both qualified and unqualified teachers.

Vaughn's math supervisor estimated that s/he typically received a total of 30 fully completed applications per year, though "when you're talking about people who drop a resume in a box at a teacher recruitment center, or send me a letter and a resume, it's probably triple that." The district also received many applicants from individuals applying for teaching jobs through a county-wide online system, but who never followed up after checking "Vaughn" as a district they might be interested in. However, the third suburban district, Young, appeared to receive far fewer applications per opening. In part, this was due to its location, the fierce competition it faced from nearby districts, and its traditional, laid-back, "they'll come to us" attitude, all of which we discuss later in this paper.

It is not particularly surprising that the suburban districts typically attracted more applicants than the urban districts. One important reason is that teachers were attracted to their districts because of their reputations. Suburban administrators were well aware of this advantage in terms of attracting high quality candidates. Nowhere was this clearer than in Webster, whose HR Director said that "[Candidates] know that [here] there is this … standard of excellence, which shows in terms of measures of student performance …. Things that make [our district] an exciting place to work." The high school math supervisor in the district noted that, "We are a well-known and high achieving district. As a result, we have been able to consistently attract very high quality teachers."

But this was not the only advantage that the suburban districts had. Their pools of math applicants likely included teachers who did not want to teach in urban districts, teachers currently in urban districts seeking less challenging working conditions, and teachers who wanted to teach in suburban districts because they were themselves educated in suburban districts and were familiar with this setting. Moreover, to the extent that the suburban districts were able to hire earlier than the urban districts, they were able to tap a larger pool of available candidates.

Depending on the district, the suburban administrators could be very selective in whom they chose to interview. The suburban administrators discussed the importance of specific grade-level experience, the experience working with a particular parent clientele, fluency in integrating literacy into mathematics instruction, non-procedurally oriented pedagogical approaches, and fit with school or department culture and colleagues. One suburban administrator talked about looking for graduates from a specific university where the mathematics education students come away with a philosophy of mathematics instruction that is valued in the district:

> Part of that concern is about having teachers trained in pedagogy and understanding the district's mission, too. We have implemented NSF programs in the past few years, like Connected Math, so knowing that requires a buy-in, a philosophy, and a set of skills that a lot of typical math teachers may not have had experience in, we try to get them at the student teaching level, and if it's working well, that's a bird in the hand.

Urban administrators were also selective. Despite the much smaller pool of applicants to urban districts, urban administrators frequently expressed the view that many otherwise "qualified" teachers did not have the additional qualities that they needed in order to be successful in urban classrooms. Urban administrators' list of desired characteristics and criteria was quite long and very difficult for any individual to meet. Like their suburban counterparts,

their ideal teacher candidate would be certified, have been prepared in a university-based teacher education program, already have teaching experience, and have classroom management skills, a deep understanding of math content, pedagogical content knowledge, and pedagogical skills such as the ability to promote active learning in classrooms as well as the ability to differentiate instruction. However, in addition, urban administrators felt that to be successful in *urban* schools, a teacher also needed qualities that included: a deep commitment to urban education; strong interpersonal skills; a liking of children and an ability to relate to them; an understanding of the lives of urban children gained through life or work experience; and various personal skills and dispositions, such as persistence, flexibility, independence, and the willingness and strength to do one's job despite the hurdles that are sometimes presented by district bureaucracy (Liu, Rosenstein, Swan, & Khalil, 2008). Although both suburban and urban administrators were selective in whom they interviewed, the qualities that the urban administrators were looking for were critical to the success of the teachers they hired, which may not have been the case for the qualities sought by suburban administrators.

So, although the overall limited supply of high quality of math candidates did make life challenging for administrators in both urban and suburban districts, urban districts faced a much tighter supply than the suburban ones.

Demand – In addition to facing a tighter supply of candidates, urban districts had a higher level of demand than suburban districts. Each year, the districts typically needed to fill openings that constituted 10-20% of their math teaching force. Urban administrators listed retirements, enrollment increases, family leaves, and dismissals (involuntary terminations) as the main factors creating these openings. Dismissals often occurred because districts could not find teachers who met their criteria and had to settle for less qualified (though "highly qualified")

teachers. Voluntary turnover, though mentioned, seemed to be a secondary factor in the eyes of these administrators.

Administrators in the three suburban districts in our study reported less turnover and more stable teaching forces than in the urban districts. Annual turnover among the math teaching force in these districts appeared to be closer to 5-10 percent. For instance, Vaughn reported filling 9 math openings for 2006-07, 1 opening for 2007-08, and 3 openings for 2008-09, out of a teaching force of 70-75 middle and high school math teachers, for an average of 6% annual turnover. When asked if the retention of mathematics teachers was a problem in Webster, one administrator said, "No. In fact we always laugh and say we can't get rid of them because they always retire and come back." This comment points to another advantage enjoyed by this suburban district, which is the ongoing support of retired teachers.

Competition – Administrators also described fierce competition for math candidates, and saw this competition as limiting both the number of applicants they received as well as their ability to convince applicants to accept job offers. Principals and central office administrators in the urban districts frequently described losing their most highly qualified candidates to other districts. Many urban administrators agreed with the high school math supervisor in one district who observed, "We are not getting what I consider to be the best people. They are going elsewhere."

Suburban administrators mentioned competition as well, though they typically were more successful in these competitions than the urban districts. For instance, administrators in Webster, the highest SES suburban district, were confident in their ability to compete for the best available candidates. As a district principal noted, "Webster has an outstanding reputation; we can get the cream of the crop." The current HR Director added:

> I could tell you as a principal in the district for 11 years, it was rare that anyone who I wanted to turn [a job offer] down, if that's what you're asking. I really would have to think long and hard to remember someone who turned it down after I offered them the job. It definitely happened at points, like some other district was simultaneously competing with me, and they were either faster or they live closer to the person's house, or something like that. But usually it hasn't been an issue.

In addition to the district's stellar reputation, Webster's administrators pointed to their relatively high salaries and lighter teaching loads compared to other districts, as factors that helped them hire as well as retain teachers. Indeed, administrators in Webster and Vaughn reported having 90-95% success rates in candidates accepting the jobs they are offered. In the third suburban district, Young, administrators also reported being fairly successful in getting applicants to accept job offers, although there was some sense that the district was slipping. One principal observed that:

> In days gone by, we never had a problem with people accepting our job offers. Lately, because some of the younger people are now looking for as much money as they can get up front, and there are districts who have a starting salary that's higher than ours, we have a bit more trouble with that. We find that it's a little bit more difficult to hold onto some of our prime candidates, when other districts are looking out.

However, not all of the suburban districts were in Webster's position relative to the competition. As will be discussed later, Young faced a very competitive environment for the best math teacher candidates and struggled a bit to land them.

Consequences of the Differences—The larger supply of math candidates and smaller demand for teachers in suburban districts had several consequences. First, suburban administrators did not have to make the same difficult compromises in their hiring decisions that urban administrators often reported. Second, suburban administrators could look beyond formal

qualifications, such as certification status, to consider a wider range of criteria when evaluating candidates. For instance, many suburban administrators looked at grade-level fit, experience working with a particular parent clientele, fluency in integrating literacy into mathematics instruction, and fit with school or department culture and colleagues. Third, schools in these districts generally hired candidates who were strong enough to handle the job, and this contributed to the lower teacher turnover rate in suburban districts since there were fewer terminations based on poor job performance.

II. The Role of Geography

Differences in districts' experiences of the staffing challenge were not simply due to differences in urban or suburban status. They were also shaped by geographic location, which influenced the overall pool of applicants available to districts as well as the competitive dynamics they faced. Districts that were located within or on the fringe of large metropolitan areas tended to have one type of experience, whereas those located in more remote areas had another.

Life In or Near a Giant Metropolis – Five urban districts (Armstrong, Basie, Ellington, Gillespie, Hampton) and two suburban districts (Webster, Young) in our sample were situated inside or on the edge of a very large metropolitan area dominated by a big city. This had several implications for districts.

For instance, being in or near a major commercial hub meant that a district had access to a highly educated population and many individuals with strong technical backgrounds, because the large nearby city was a magnet for young people and contained many universities. Proximity to a major city could also be a boon for administrators when recruiting outside of the region. A recruiter for urban Gillespie mentioned that when talking to candidates from out of state, she

"plays up" the proximity to the large city nearby and all that it has to offer. The district also tries to sell the diversity of the city of Gillespie as well as its larger neighbor.

However, the large supply of young, highly educated individuals could be somewhat of a mixed blessing, for this population is also mobile and transient, and their life and career decisions sometimes contribute to increased teacher turnover. According to Ellington's secondary math supervisor, "A substantial number of folks who come to Ellington area institutions of higher education are not local to Ellington, and many of them return to their home states or communities and work there." Thus, he and other administrators in the urban district described losing several math teachers every year, because individual teachers decided to move closer to extended family or because spouses accepted job offers elsewhere.

Although these large metropolitan areas had highly skilled populations, administrators still complained that there were too few qualified mathematics teachers to go around. As a result, these metropolitan areas often experienced fierce competition for the most highly qualified applicants. Amidst this competition, an affluent suburban district located near the central city could benefit from its location near a dynamic hub while offering candidates high salaries, good working conditions, and a supportive community. In contrast, a smaller urban or a less affluent suburban district located on the fringe of the large metropolitan area might have a more difficult time attracting and hiring the best math candidates available. Indeed, the administrators in the urban districts located on the edge of a metropolis reported being squeezed between the large district nearby, which could offer more opportunities for professional growth and a more dynamic location, and affluent suburbs that could pay more and offer more attractive working conditions. As an administrator in Basie explained, "We're in competition with very high ranked school districts [nearby]. Those districts also need math teachers…. Not only do we find that

teachers who are highly qualified go to these districts, but we lose our own teachers to them." Administrators in suburban districts located on the fringe of a metropolis also reported competition, though that competition was mostly with other suburbs and was a bit less fierce.

This is the pattern that we saw in the illustrative experiences of three districts located within the same metropolitan area—Webster, Ellington, and Armstrong. Ellington is the large city at the center of the metropolitan area; Webster is an inner-ring suburb of Ellington, and Armstrong is a smaller city located approximately 20-30 miles from downtown Ellington. Of the three districts, Webster, the affluent suburb, had the most success attracting a large volume of applicants and landing the most highly desirable candidates. It benefited from being located right next to a large city and received many applications from nearby college and universities. As was mentioned earlier, it also benefited from a very strong reputation, high salaries, and good working conditions. Ellington seemed to be the second most successful, in part because it was seen as a dynamic place to live but also because the district paid well and had made significant improvements in how it organized and conducted recruitment and hiring (Liu, et al, 2008). Finally, of the three districts, Armstrong struggled the most to find and hire the math teachers it needed. The administrators in the district, like the administrators of other urban districts located on the urban fringe, described losing candidates to the big city as well as to nearby suburbs that paid more. Even when Armstrong found candidates who were willing to teach in an urban setting and who they judged to be qualified, they often lost them to the larger urban district nearby.

Isolated Districts – Four districts (Calloway, Dorsey, Joplin, Vaughn) in our sample were more isolated than districts like those discussed above. As such, they were relatively shielded from competition from other districts. While they certainly competed with nearby districts for math teachers, administrators tended not to describe the same sort of competitive

frenzy as did the administrators in districts located in larger metropolitan areas. They also had fewer problems with retention, since many of the teachers they hired had local roots and were not likely to leave the region. As one Calloway principal explained about his school:

> We don't get a lot of teachers who, after a year or two, say, "You know, this just isn't for me. I'm going somewhere else; or I'm leaving teaching; or I'm going to another school." Once they're here, they pretty much, as we like to say, get infected with the [name of school] spirit.

The challenge facing these districts tended to be with the overall supply of potential math teachers. These districts plumbed local labor pools and tried to develop strong working relationships with nearby colleges and universities. They also recruited out of state and even in Puerto Rico. Yet there was some question in the minds of administrators about whether recruiting from far away was worth the expense. Dorsey's math supervisor observed that her district "struggles with bringing people in from a distance. That has not been successful….Our rate of bringing people in from other cities was not good at all." And referring to the cold climate in the Northeast, she added with a bit of lighthearted sarcasm, "I don't know why they wouldn't ever want to come to sunny, tropical Dorsey."

Vaughn, a middle-class suburb of Dorsey, also appeared to benefit from a less transient labor pool. Turnover in the district was quite low on average, despite a spike in departures in 2006-07. As the districts' HR Director explained: "I think we're in an area where people don't move in on a whim, ha, and people, let's put it this way if I look at an application and the student grew up in this area, went to school to be a math teacher, I bet I'm going to retain that person, because all of the factors will keep the kids close to this area and things are going well". According to one administrator, the district's strategy was to recruit local student teachers, instead of inducing people to move to the area:

> I think it's been much more powerful to get good student teachers in, inculcate them when they are student teaching…and try to keep that relationship open with them, and try to put them wherever you can for a little bit. I've had them in [as] long-term subs, trying to piece pieces [of jobs] together. Then, eventually they've been with us.

III. Policy Challenges

A number of policies appeared to influence the nature of the staffing challenge facing both urban and suburban administrators, as well as how they responded to the challenge. These included the federal reauthorization of the Elementary and Secondary Act in 2001, better known as *No Child Left Behind (NCLB)*, state early retirement incentives, alternative certification programs or accelerated routes to teaching, and school funding mechanisms and budget delays. Although these policies had a somewhat larger impact on urban districts, suburban districts were also affected by them to a surprising extent. This may reflect, in part, the reduced distinctions between urban and suburban contexts.

NCLB. The highly qualified teacher (HQT) mandates of *NCLB* required that all teachers of core academic subjects must: (1) hold a bachelor's degree; (2) obtain full state certification, which could be alternative certification; and (3) demonstrate subject-matter competency in the core academic subjects taught.

The HQT mandates of *NCLB* affected the work of administrators in a number of ways. First, the HQT requirements restricted the supply of candidates and also reduced administrators' flexibility in hiring. In most cases, administrators would not consider candidates who did not already have iron-clad certification. Some of the effects of this response to the *NCLB* mandate were rather subtle. For instance, in the past, administrators might hire a teacher whose

certification status was not entirely in order but whom they expected would soon be fully certified. This might include:

- teachers who held certification in another state and were in the midst of applying for in-state licensure through reciprocity agreements,
- teachers who were already certified in another subject but who were just a course or two away from receiving a math endorsement, or
- students graduating from teacher education programs who had yet to pass their state teacher exams.

Now, however, administrators shied away from or completely avoided making these types of hires.

Licensure was a major preoccupation of administrators and of human resource directors in particular. Asked what characteristics and background factors were most important in hiring a math teacher, Armstrong's director of human resources responded, "Licensure, licensure, licensure."

A second way in which *NCLB* affected districts was by raising the specter of having to replace current math teachers who, under the policy, were no longer considered "highly qualified." This was especially an issue for the middle schools, where some math teachers were currently teaching under general K-6 or K-8 certificates and did not hold subject-area certification. The middle school math supervisor in Gillespie described a training initiative that the district had put in place to help current middle school teachers get certified in mathematics, without which the district's situation would be more dire:

> If a lot of our teachers were not pursuing the middle school math cert[ification], then there would be a mass exodus from 6, 7, 8, and then we'd have a massive shortage. Since

> a lot of them are doing that and they are getting ready, that's going to cut down on the need to hire.

Without such training programs, urban districts faced scenarios where they would have to replace an experienced teacher who was not "highly qualified" but might have demonstrated long-term effectiveness in the classroom with a low-quality teacher with little experience, but who, from the credentialing perspective, was "highly qualified."

The NCLB mandates seemed to have a disproportionate effect on the urban districts in our study, because screening candidates who did not meet the HQT provisions out of their already small pools left them with even fewer applicants from which to choose. Moreover, urban administrators were more likely to employ substantial numbers of math teachers currently teaching in their district who did not meet HQT criteria and thus would either have to be retrained or replaced. Indeed, none of the administrators in the suburban districts mentioned the need to provide training to their math teachers in get them certified in secondary mathematics.

Alternative Certification. The districts in our study were located in states that had alternative certification programs, which increased the supply of math candidates available to schools and districts.[3] Although, in general, administrators greatly preferred hiring teachers who had traditional preparation, some administrators in urban districts often had no choice but to hire alternatively certified teachers.

Urban districts were much more likely to hire alternatively certified mathematics teachers. Of the urban districts, Armstrong and Gillespie relied the most on alternatively certified teachers; approximately 50 percent of Armstrong's new math hires came from this source, and virtually all of Gillespie's new high school mathematics teachers did (66-100% between 2006-

[3] One state in our study had very loose requirements for getting a provisional teaching license: teachers could receive it just by holding a bachelors degree and passing a state literacy and content-area exam.

2008). Ellington also hired a fair number of teachers without traditional preparation, including candidates from the district's own alternative certification program. Some administrators did feel, however, that many of the alternatively certified math teachers were only capable of teaching the curricula in the lower grades (i.e., Algebra and Geometry at the high school level), and that few had a deep enough knowledge of content or pedagogy to teach the more advanced math topics. According to this view, then, alternatively certified teachers were not perfect substitutes for traditionally certified teachers. One suburban district, Young, gets many alternatively certified teachers applying to the district, but it hires very few.

School Funding Mechanisms and Budget Delays. Administrators in both urban and suburban districts reported that budget delays hampered their ability to compete for and hire the best mathematics candidates. The sources of these delays were somewhat different for the two types of districts, however.

Urban districts, for instance, were greatly affected by delays in state and city budgets, since their reliance on these sources of funding had increased over the years. Urban districts tend to receive a higher proportion of their funding from state and local government, since they are often the recipients of compensatory education funds or, in some cases, have been taken over by the state. As a result, they can be disproportionately affected by budget delays which can, in turn, negatively affect their hiring timetables. According to school administrators, sometimes state or local governments did not finalize the budget until June, which meant that they could not hire new teachers until well past the time when the most desirable candidates had already accepted job offers of other districts. Basie's math supervisor described the problem:

> Our funding does not come from direct voter property taxes…. Instead, it is determined by City Hall, and what we receive from the state, and what we receive from grants. And this has an impact on teacher contracts, and who is hired, and when they are hired. I know

> that in other school districts, notices go out in the newspaper starting in January…. We're just beginning to interview candidates [in June], and we'll probably be doing that up until two days before school begins…. And that's because there is a delay in settling the budget…. These are all [factors] that have an impact on the hiring of good math teachers.

Suburban administrators also mentioned the role of late budgets in delaying hiring, but these delays often arose from uncertainty regarding the passage of school levies and budgets that had to be voted upon by the electorate. They reported that their districts could no longer count on routine passage of school levies, and they, too, faced significant amounts of year-to-year budget uncertainty. Indeed, over the course of our data collection, bond votes failed in two of the three suburban districts.

IV. Organizational Factors

Organizational decisions, structures, and processes also shaped the challenge and affected administrators' ability to respond to it. In particular, the organization of the hiring process influenced how districts experienced and responded to the staffing challenge. Differences across the districts appeared to be less related to urban/suburban status and more related to issues of scale and to the decisions of administrators. For the large urban districts in our sample, organizing and carrying out the human resources function was a huge endeavor, and administrators had to deal with much more complexity (and well as more established bureaucracy). In contrast, the smaller urban districts and the suburban districts, which were similar in size, seemed more nimble.

According to the interviewed administrators, the timetable of the hiring process played a significant role in their ability to attract and land desirable candidates. Many administrators felt their districts were relatively successful in hiring quality candidates if and when they were able

to hire early. However, when they hired late, they lost many of the best candidates to other districts. As time passed, the pool shrank in both quantity and quality. Dorsey's math supervisor explained that, "If we're going to hire some math teachers we have to hire them early, because by the time you get to August 1st, the pool is very, very small." A Calloway principal agreed, stating that, "If you're trying to hire someone in mid-August, the best candidates will already have jobs." Administrators in the three suburban districts reported a hiring timeline that typically started earlier in the year than those of the urban districts. However, it is noteworthy that suburban districts were not immune to some of the hiring delays, and the challenges that resulted from them, that the urban districts faced. Indeed, administrators in two of the suburban districts (Young and Vaughn) reported that most hiring did not start until May.

Several factors contributed to the late hiring, one of which has already been mentioned: delayed budget decisions. In addition, veteran teacher transfer provisions in the district's collective bargaining contract sometimes slowed down hiring, although this did not have as much of an impact as we expected. Despite the fact that the excess and transfer system[4] is often pointed to as a main constraint on districts' ability to hire whom they want and to do so in a timely manner, very few administrators in our study, when asked, saw this as a significant factor. Only in Basie did the need to accommodate seniority-based transfers play a dramatic role in delaying hiring; there the district was obligated to complete three rounds of internal postings before candidates from outside the district could be considered and hired. In three other districts—two urban and one suburban—the transfer process did slow down hiring somewhat,

[4] The transfer system refers to a system in which teachers already working in the district can request a transfer to another school that has an opening. The excess system refers to the system by which tenured teachers whose positions have been eliminated (either due to changes in enrollment or in academic programming) are placed in new positions since they have guaranteed employment in the district. These two systems may be linked or may operate separately. Also, districts vary in terms of the role that seniority plays in determining whose transfer request gets approved or where "excessed teachers" are placed.

but its impact had been greatly reduced by changes that had been introduced over the past few years. Indeed, in the vast majority of districts, administrators said that they were in no way contractually bound to honor a veteran teacher's request to transfer schools or change positions. A veteran teacher transfer process takes place in each of the suburban districts we interviewed, but it only delays the hiring in one, Vaughn. One administrator explained "It delays..., I think, knowing exactly where your peer vacancies are, your true vacancies. Yes, it delays it. It's usually done by the end of May." Because of this process and budget related issues, this district does not interview teachers until late May or June, which is later than many of its neighboring districts; district administrators believe this costs the district the best mathematics candidates. Overall, however, across the eleven districts the seniority system appeared to have a rather limited impact on administrators' capacity to hire quality math teachers.

Delays also resulted from the length of time it took for the human resources office to make and finalize job offers. District human resource (HR) offices varied in their ability to make a speedy offer once a school decided it wanted to hire a certain candidate. The suburban districts (which were still quite large) and the smaller urban districts tended to be a bit nimbler than the larger ones. Not surprisingly, HR directors and principals often had somewhat different perceptions of the responsiveness of the HR office, though all seemed to recognize the need to move quickly to hire teachers in shortage areas such as math. Principals were often frustrated by how long it took to finalize a job offer and get the contract signed and approved. A principal in one of the larger districts explained:

> The process takes too long. It can take anywhere between 2-3 months…. It has to go to Board meetings in order to be approved. If it doesn't make a cut-off for the Board meeting, it gets extended to the next Board meeting the following month. It can be delayed. And then so many associate [superintendents] have to sign the recommendation

> [to hire]. It's a long process. Sometimes you lose candidates that way, too…. People get discouraged; they don't want to wait that long…. They get offered other positions.

In contrast, in one of the smaller urban districts, one middle school principal described a relatively nimble response from the central HR office after being informed about a desire to hire a candidate: "With math people, they [complete the paperwork] pretty quickly, because they know it's important. They have made offers that afternoon." The efficiency of human resources offices thus seemed important to principals' ability to hire the candidates they wanted.

The length of the work-year for principals also seemed to influence hiring activity. In at least two districts, Armstrong and Basie, principals were not contractually obligated to work through the summer. They left for the summer a few days after the teachers left, and returned a few days earlier than the teachers returned. If they were not able to fill a position by June—as was likely the case in both districts—then they sometimes waited until the week before school started to fill it. Earlier hiring seemed to depend on principals' willingness to come to school over the summer on their own time to interview candidates; it is reasonable to assume that those that did were more likely able to hire suitable candidates, while those who waited were more likely to have a greater challenge.[5]

Finally, the division of labor and decision-making authority between individual schools and central office also appeared to affect principals' efforts and how they experienced the challenge. The organization of the hiring process influenced the amount of initiative principals could take on their own, the amount of communication and coordination that had to occur between HR and individual schools, and the amount of internal competition among schools for the best math candidates. Some districts managed the tension between centralization and

[5] This topic was not addressed in the interviews of suburban administrators.

decentralization quite well and reaped its benefits (e.g., benefiting from efficiencies while also providing principals with flexibility and autonomy), while in other districts the tension often resulted in bottlenecks and delays that hampered the hiring process.

V. How Geography, Student Demographics, and District Policies and Decisions Sometimes Trump Suburbanicity

As we have noted several times in this paper, differences in districts' experiences of the staffing challenge were not simply due to differences in urban or suburban status, for we found significant variability among the districts within each group. Other factors, including geographic location, socioeconomic status, and administrators' decisions also shaped the nature of each district's staffing challenge and influenced its capacity to meet the challenge. Indeed, we have found that the urban and suburban categories and labels are somewhat limited in their ability to characterize district contexts, for they simplify the diversity of these contexts and lump together districts that are not all that similar.

The case of the "suburban" district, Young, illustrates how a complex confluence of factors often shaped the nature of a district's staffing challenge. Some aspects of the math staffing challenge in Young are similar to those of the other suburban districts in our study, whereas others are more similar to those faced by the urban districts in our study.

Young is a small city that is not a traditional suburb in that it is not a bedroom community for a large nearby metropolis. Although there is a large city approximately 30-40 miles away, Young is located amongst other towns and cities that contain many service-sector businesses and research organizations (i.e., high tech, biotech, health services, etc.). The town has a population of just under 100,000 people and is quite diverse: approximately 60% of residents are White, 5-10% are African American, 5-10% are Hispanic/Latino, and 30% are

Asian or are of another ethnicity, of any race. The population is also highly educated and professional, although it also contains a small lower middle class/working class population. Like many districts, the public school student demographics are somewhat different from those of the city's overall demographics. The district's students are approximately 35% White, 10% African American, 10% Hispanic, and 45% Asian and other. Ten percent of the students are eligible for free or reduced price lunch.

Of the three suburban districts in our sample, Young struggled the most to find and hire high quality mathematics teachers. As one principal noted, the applicant pool was so unsatisfactory that it sometimes affected her decision whether to renew a subpar teacher: "We've kept people we feel are not quite at the level we would like, because we just don't have anyone else coming forward." This same principal worried that if she were to lose any of her current AP or Honors math teachers, she would find it difficult to replace them with candidates who could do the job up to standards.

In part, the poor supply was due to the district's geographic location and the competition it faced. Young's Math Supervisor described how all of the math supervisors in the county vied for the same few candidates:

> Unfortunately there aren't as many really good people out there that I like and districts end up fighting for the same kids. I participate in a supervisors group for [the] county, and many times we sit around a table and discuss candidates by first name and we each know who they are. So the candidate pool of good people, in particular coming out of colleges, is rather limited, vis-a-vis the needs of my school, the district, and the districts in the county…. Basically the pool is small.

Moreover, Young likely competed with school districts outside of the county. It was not uncommon for teachers in the densely populated state to commute across county lines to teach.

Indeed, the district's HR Director worried that the district would increasingly be forced to go outside the state to find candidates: "I think when it comes to the point where I can't draw out of [our state] any more, maybe some of our supervisors will have to go to [two neighboring states] to see if there is anything else around." In many ways, then, the competitive pressure Young faced was more akin to that faced by some of the urban districts located on metropolitan fringes than the two other suburban districts—one of which was located in a more remote region, and other of which was also located in an urban fringe but more affluent and closer to the city center.

Geography alone, however, did not explain the fact that a suburban district like Young received relatively few applications for middle school and high school math openings. District contracts, policies, and decisions also affected supply. Administrators, for instance, worried that Young's teacher salary scale was too back loaded and its starting salaries had become less competitive than those of other districts in the county. In addition, the districts' policy of crediting veteran teachers with a maximum of four years of experience regardless of their actual level of teaching experience was seen as limiting their ability to recruit and hire more experienced math candidates. As the HR Director noted: "I've lost some [candidates] because I can only go to the fourth step. Other districts don't have that set level that we can bring them in, so sometimes they do beat me out because they're offering more to start."

How the district organized and carried out the recruitment and hiring processes also hampered administrators' ability to hire high quality candidates. The district recruitment efforts rely heavily on a single job fair that it hosts every year. Modest advertising for this event starts in January/February and it takes place in March, which one administrator believes is too early in the year for traditional route teachers to think about applying for jobs. Many of the job fair attendees are teachers who come through an alternate route, whom district administrators do not like to

hire. Although administrators often identified some good candidates at this fair, the gap in time between the job fair and when the district actually offered contracts to applicants could often stretch out to 2-3 months or more. As one principal in the district explained:

> In all truth, we've lost several good candidates because there is such a time between the posting and the job fairs and the interviews, and the time that they're actually approved by the Board….We get some of the candidates coming out of the colleges very nervous about a position, and our Board does not allow us to hire until the budget is passed, or not passed, until it's figured. So, they'll hang for months waiting, and we've lost several candidates because they say, "Look, I got an[other] offer, I'm signing a contract, and they leave." That's probably the worst thing for us. I have to say that's most detrimental to our hiring.

Another principal concurred with the view that hiring delays were highly problematic and further explained the origins of these delays:

> What's happened in our district, particularly in the past two years, our budget has gone down [i.e., defeated by the public vote]. A strategy that we've taken—frankly, I'm not in agreement with it—is to hold any filling of any positions until an agreement can be worked out between the school board and municipal government as to what the budget is going to be. It sounds like a sane idea, but it really isn't. Because there is some kind of limit to what can be cut from the budget, in terms of dollars and cents…. If you have four math retirements, you can't tell me you're not going to replace three of them, if not all four of them, regardless of what happens in the budget…. I can understand [a hiring freeze] if you're talking about a new position. You don't want to commit the district to new monies. But if people are retiring or resigning or being let go, those positions are going to still exist….So it's tied the hands of the supervisors sometimes to recommend to the principals to interview, and then if that has happened, it's tied our hands to recommend to the Superintendent.

Thus, a well intentioned but perhaps over-cautious policy related to the budget has contributed to the difficulty in hiring the best candidates in the pool. Many administrators felt

that the district also needed to broaden its recruitments efforts beyond the job fair. One Young administrator noted that "I don't feel like they advertise as well. They put it out in the newspapers and on the web, this job fair, but …we only pull from those who showed up at the job fair. … In fact, [nearby university's] program for educators we feel is one of the strongest, and when we can get those candidates, they start with like ten extra points in our mind … But we as a district do not go out of our way to make connections with [that university], other than to just do a regular posting."

Finally, the demographic composition of Young's student population, and its educational implications, influenced the nature of the challenge facing district administrators. Of the three suburban districts, Young had the most racially and ethnically diverse student population. A principal noted that 72 languages were spoken in the district. Thus, in much the same way that administrators in the urban districts had additional criteria for judging candidates beyond the standard criteria that all districts looked for, Young's administrators placed importance on certain skills and characteristics that the administrators in the other suburban districts might not have. As the math supervisor noted, to be a successful teacher in the district:

> There are certain requirements. You have to know your math, but also, you have to be able to deal with diverse classroom populations. You have to do that. You have to be able to speak English clearly. There are certain things that have to be maintained.

Two district principals also mentioned the importance of good classroom management skills.

Administrators in the district were also hoping to diversify their teaching force to better reflect the district's student population. As one administrator put it:

> In the math areas, I have very few minorities, I could use more. Young, as you know, is a very diverse district. Our population has all sorts of folks in it, and our school system doesn't quite reflect it entirely. Although it is getting much better. I noticed Young High

> School [one of two] seemed to have more minority teachers, and that's a good thing, that's a very much good thing. That's problematic in that regard."

Thus, in many respects, suburban Young experienced some of the same challenges as those of some urban districts. Some of the challenges were due to the district's geographic location and the needs of its students, whereas others were more "self inflicted"—i.e., the result of policies and practices that administrators had chosen to adopt.

DISCUSSION AND CONCLUSION

Policy debates surrounding how to improve America's schools often rest on simplistic distinctions between urban and suburban settings. Urban districts are often seen as the locus of most of society's educational problems, and suburban districts are often assumed to be doing well or are simply ignored by policy. To a large extent, the focus on improving urban districts is warranted, for they continue to struggle to educate large numbers of poor students and students of color under challenging conditions. However, given the changes going on in suburban districts and the fact that many are serving increasingly diverse student populations, it is important to also examine what is happening in the wide range of suburban contexts.

Comparing Urban and Suburban Challenges

We expected to find that the math staffing challenge to be somewhat less severe in suburban districts and for suburban districts to have certain competitive advantages in the search for talent, and indeed much of our findings confirmed these expectations. Administrators in suburban districts reported receiving many more applications per mathematics opening than did their urban counterparts, and they reported needing to fill fewer vacancies each year. This had several important consequences. First, suburban administrators did not have to make the same

difficult compromises in their hiring decisions that urban administrators often reported. Second, suburban administrators could look beyond formal qualifications, such as certification status, to consider a wider range of criteria when evaluating candidates. For instance, many suburban administrators looked at grade-level fit, experience working with a particular parent clientele, fluency in integrating literacy into mathematics instruction, and fit with school or department culture and colleagues. Third, schools in these districts generally hired candidates who were strong enough to handle the job, and this contributed to the lower teacher turnover rate in suburban districts since there were fewer terminations based on poor job performance.

Despite these advantages, however, suburban administrators still reported that finding and hiring high quality mathematics teachers was a significant challenge. They complained about the size and quality of the applicant pool, for although they received many applications for math openings, they considered few of these candidates to be qualified to teach in their districts. Some of them also faced fierce competition for the best candidates from neighboring suburbs. Suburban administrators, like their urban counterparts, also described how factors related to federal, state, and local policy, and to district and school organization further complicated the challenge of ensuring that all of their students were taught by high quality mathematics teachers. Many reported, for instance, that late or uncertain school budgets increasingly delayed their ability to hire early, which hampered their ability to get the best candidates.

However, differences in districts' experiences of the staffing challenge were not simply due to differences in urban or suburban status, for we found significant variation among the districts within each group. Other factors, including geographic location, socioeconomic status, and administrators' decisions also shaped the nature of each district's staffing challenge and influenced its capacity to meet the challenge. For instance, we saw in the case of Young, a

suburban edge city, how geographic location affected the competitive dynamics it faced, how the organization of recruitment and the structure of the salary scale affected its ability to attract applicants, how a policy to freeze all hiring before the final budget was set hampered administrators, and how a diverse student population may have influenced the criteria that administrators used for screening and evaluating math candidates. Thus, Young's staffing challenge was different from that of Webster, a more affluent inner-ring suburb, and Vaughn, a middle- and working-class suburb located in a more remote region. Indeed, we found that the urban and suburban categories and labels to be somewhat limiting in terms of characterizing district contexts, for they simplified the diversity of these contexts and lumped together districts that were not all that similar. We also found differences in the intensity of activity surrounding the recruitment and hiring of mathematics teachers.

Comparing Urban and Suburban Strategies

Although this paper focuses on staffing challenges facing urban and suburban districts, we also documented and analyzed the strategies the districts used to address these challenges (Liu, et al, 2009, submitted). In general, we found that the urban administrators were more aware of the challenges associated with recruiting and retaining math teachers and felt this challenge keenly. Perhaps as result of this, they were trying a lot of things to address the challenge. For instance, they tried to intensify their recruitment activities, sought flexibility in pay and incentives, partnered with universities and organizations such as Teach for America, tried to improve support for new teachers, offered training to grade 6-8 teachers to certify them in mathematics, made changes to how they organized the hiring process, invested in information technology and online systems to support HR activities, etc. Although their efforts were not always focused or coordinated, the administrators were implementing a variety of supply-side

and demand-side strategies to meet the challenge as well as trying to make organizational reforms that would assist their recruitment, hiring, and retention efforts.

In the suburban districts, however, administrators did worry about the quality of the math teacher pool, but were not exerting themselves as much. For them, the staffing challenge was less severe, and the supply of teachers was still adequate and allowed them to fill with positions with satisfactory candidates. Perhaps as a result, they did not feel the need to change, in any fundamental ways, how they went about recruiting and hiring math teachers. However, as suburbs change in character as a result of changing demographics, this complacency may be dangerous for certain districts. More suburbs may end up like Young, and face more severe staffing challenges if administrators are not proactive.

Future Directions for Research

Our research has focused on the experiences and perspectives of district and school administrators with regards to the math staffing challenge. One possible area for future research involves better understanding the perspectives and experiences of teacher candidates and how their job search experiences affect where they end up teaching. There is some emerging research on the topic of how prospective teachers decide where to apply (Cannata, 2007), but we need a deeper understanding of how these decisions interact with the organization of the recruitment and hiring processes. How big is the population of math teachers interested in or open to teaching in urban schools, and what are some of the barriers to their ending up in these schools? Do their experiences with the late, drawn-out, and bureaucratic hiring processes in some urban districts discourage them from teaching in districts that they were initially interested in? Answers to these and other related questions might help administrators and policymakers devise strategies

to increase the numbers of job applicants to urban districts, which are struggling the most to staff their classrooms with high quality math teachers..

Another possible direction for research in this area involves examining the nature of the math staffing challenge in smaller cities and suburbs. We interviewed administrators in medium to large urban districts (15,000-50,000+ students) and in large suburban school districts (12,000 to 15,000 students). We do not know if the challenge is less or greater in districts with fewer students, so adding a sample of districts with fewer students might provide insight into this question.

Finally, more research could be done on how urban and suburban districts are tapping distinct pools of candidates, including student teachers as well as teachers' aides and paraprofessionals. Are there differences in how districts work with student teachers and cultivate them as potential new hires?

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