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Policy Implementation, Principal Agency, and Strategic Action: Improving Teaching Effectiveness in New York City Middle Schools

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Ten years ago, the reform of teacher evaluation was touted as a mechanism to improve teacher effectiveness. In response, virtually every state redesigned its teacher evaluation system. Recently, a growing narrative suggests these reforms failed and should be abandoned. This response may be overly simplistic. We explore the variability of New York City principals' implementation of policies intended to promote teaching effectiveness. Drawing on survey, interview, and administrative data, we analyze whether principals believe they can use teacher evaluation and tenure policies to improve teaching effectiveness, and how such perceptions influence policy implementation. We find that principals with greater agency are more likely to strategically employ tenure and evaluation policies. Results have important implications for principal training and policy implementation.

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Introduction

Researchers have rightly paid much attention to the role teachers play in altering a variety of student outcomes, from academic achievement (e.g., Chetty, Friedman, & Rockoff, 2014) to school engagement (e.g., Liu & Loeb, 2018) to social and emotional skills (e.g., Blazar & Kraft, 2017). Policymakers and educators have explored a range of approaches—from professional development and coaching programs to financial incentives, teacher evaluation and rigorous tenure standards—to shift teaching practice and consequentially improve student outcomes. While some of these approaches have been successful in pilots or targeted applications, rarely have they produced sustained success at scale.

Teacher evaluation provides a prominent recent example. Redesigned teacher evaluation was implemented in most states over the last decade, following a confluence of research (e.g., Kane & Staiger, 2012) and substantial federal policy incentives (e.g., Race to the Top, Teacher Incentive Fund, NCLB waivers). Some studies show strong positive effects of evaluation policies in some settings, especially when the policies provide regular feedback to teachers (Dee & Wyckoff, 2015; Papay, Taylor, Tyler, & Laski, 2016; Taylor & Tyler, 2012). However, large scale studies of teacher evaluation and performance pay in New York, Tennessee, and Texas (Fryer, 2013; Marsh, Springer, McCaffrey, Yuan, Epstein, Koppich, Kalra, DiMartino, & Peng, 2011; Springer, Ballou, Hamilton, Le, Lockwood, McCaffrey, Pepper, & Stecher, 2010; Springer, Pane, Le, McCaffrey, Burns, Hamilton, & Stecher, 2012; Springer, Swain, & Rodriguez, 2016) show little benefit for students. Moreover, systematic studies of revised teacher evaluation systems demonstrate that in most states nearly all teachers are rated as effective or better (Kraft & Gilmour, 2017). This result mirrors teacher evaluation ratings prior to evaluation reform (Weisberg, Sexton, Mulhern, & Keeling, 2009). Taken together, these results have led

pundits and the popular press to increasingly conclude these systems have failed to improve teaching effectiveness and student outcomes when implemented at scale and given their cost, should be eliminated (Dynarski, 2016; Gates & Gates, 2018; Iasevoli, 2018; NCTQ, 2017; Strauss, 2015).

Dismissing policies as ineffective because of inconsistent results may be premature. A rich literature on policy implementation suggests that well-designed policies, successful in smaller pilots, often disappoint when implemented at scale (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Recent studies, for example, find that teacher evaluation was not consistently implemented in the ways policies were designed (Donaldson & Woulfin, 2018; Marsh, Bush-Mecenas, Strunk, Lincove, & Huguet, 2017; Stecher, Holtzman, Garet, Hamilton, Engberg, & Steiner, 2018). The reasons underlying failed implemention are varied. A policy that fails to achieve its intended outcome because its design is overly complicated is quite different from one that fails because school personnel have insufficient resources to implement it reliably, or one where policy makers made little effort to encourage school leadership to embrace the approach. Understanding more about reasons underlying implementation can facilitate the design of policies that are more likely to achieve desired outcomes.

Policies intended to improve teaching effectiveness are usually designed by states or districts but implemented by school leaders. However, school leaders are rarely considered in the teaching effectiveness literature (Goldring & Pasternak, 1994; Grissom, 2011; Harris, Rutledge, Ingle, & Thompson, 2010). The studies that do foreground the role of principals suggest they are critical actors in policies targeting teacher evaluation and development. Marsh and colleagues (2017) find that school leaders and teachers in New Orleans employing the same teacher evaluation system enacted it quite differently. Some teachers (and schools) were “reflective,”

embracing the process of teacher evaluation and enhancing it; others were compliant, while still others resistant. Donaldson and Woulfin (2018) also highlight the range of principals' responses to teacher evaluation policies in Connecticut. Principals vary in their framing of evaluation policies—as tools for either accountability or development—and engage in range of "discretionary activities" in implementing these policies. Donaldson and Woulfin (2018) suggest that discretionary activities, in turn, either enhance or mitigate the likelihood of the Connecticut evaluation policy achieving its intended goals. In a large scale analysis of teacher evaluation across three school districts and five charter management organizations, Stecher and colleagues (2018) found that principals often do not implement teacher evaluation policies as intended, possibly limiting associated improvements in teaching effectiveness or student outcomes. Taken together, these studies suggest that policies targeting teaching effectiveness are unlikely to realize their objectives unless principals strategically implement policies in service of such goals.

In this paper, we assess the variability of New York City (NYC) principals' implementation of state and district policies intended to promote teaching effectiveness with a particular focus on principals' belief in their ability to use policies to improve their teacher workforce, which we term principal agency. A first step in policy implementation is developing an understanding of the policies and a belief in their potential utility. We survey and interview middle school principals and link that data to rich administrative data to understand whether principals believe they can use teacher evaluation and teacher tenure review policies to improve the effectiveness of their teachers, and to examine how differences in perceived agency influence proximal outcomes intended by the policies. Specifically we focus on three research questions:

1. To what extent do principals perceive they have agency to influence the teaching effectiveness in their schools? How does agency vary by the attributes of teachers?
2. Does principal agency vary systematically with the attributes of principals and of the schools they lead?

3. Do principals with high agency use different strategies to implement the policies in service of their goals?

We find that principals vary in their belief in their ability to improve teaching in their school. Principals with greater agency are more likely to strategically employ district policies concerning tenure review and evaluation, with the articulated goal of improving the teacher workforce. The results of this study highlight the central role of principals in the implementation of policies targeting teachers, and foreground the importance of principals' belief in their own abilities and the usefulness of the policies in achieving state and district policy goals. Without buy in from key policy actors like principals, policies, regardless of their design, are unlikely to actualize necessary changes in teaching.

Background and Framework

Accumulating evidence demonstrates that school leaders matter for school success (see Hallinger & Heck, 1998 and Waters, Marzano, & McNulty, 2003, for reviews). High quality principals consistently predict a range of positive school outcomes, including student achievement (e.g., Andrews & Soder, 1987; Branch, Hanushek, & Rivkin, 2012; Brewer, 1993; Cheng, 1991; Grissom, Kalogrides, & Loeb, 2015; Goldring & Pasternak, 1994; Leithwood, Jantzi, Silins, & Dart, 1993; Leithwood, 1994), increased teacher satisfaction (Grissom & Loeb, 2011), lower teacher turnover rates (Boyd, Grossman, Ing, Lankford, Loeb, & Wyckoff, 2011; Grissom, 2011), and teachers' commitment to school reform (Yu, Leithwood, & Jantzi, 2002). Exit surveys of teachers find that the single most important factor in teacher retention is the leadership of principals (Boyd et al., 2011; Johnson, Kraft, & Papay, 2012; Ladd, 2011).

Strategic management of the school's teaching force is among the most important mechanisms by which principals can improve school outcomes (Cohen-Vogel, 2011; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Loeb, Kalogrides, & Béteille, 2012). Effective human

resource management involves a focus on the composition of the teacher workforce, as well as on the opportunities for capacity building and instructional improvement for teachers in the schools (Cohen-Vogel, Osborne-Lampkin, & Houck, 2013; Grissom, Loeb, & Master, 2013). Many principals, however, struggle to manage the varied responsibilities associated with leading strong schools (Grissom & Loeb, 2011).

Among their many responsibilities, principals are acknowledged as the instructional leaders of their schools. Yet we know relatively little about how they use district and state policies to attempt to systematically improve teaching effectiveness, or why they make particular decisions around policy implementation. Some evidence finds that skilled principals encourage less effective teachers to leave if they do not improve, and that some principals employ district evaluation measures when making these personnel decisions (Grissom, Loeb, & Nakashima, 2014; Jacob, 2011). Principals are also differentially skilled at counseling out ineffective teachers, another oft-cited strategy for managing the teacher workforce, but little research has focused on principal beliefs around strategic retention decisions (Balu, Béteille, & Loeb, 2010; Grissom & Loeb, 2011; Yariv, 2006). Recent research finds that principals differentially embrace teacher evaluation policies, which may contribute to uneven implementation of such policies and account for inconsistent effects (Donaldson & Woulfin, 2018; Marsh et al., 2017). Donaldson and Woulfin (2018) suggest more research is needed to understand principals' decision-making processes around teacher-focused policies, and they foreground the importance of attending to both principal agency and structural or contextual constraints in analyzing policy implementation.

Given the need to improve teaching effectiveness and the central role of principals to achieving that goal, we need to know much more about how principals approach the

implementation of teacher policies. Do principals use the information provided through these policies to shape their decisions on teacher professional development and teacher retention? How do principals' beliefs about teachers' ability to improve inform tenure decisions? To what extent do principals see evaluation systems as actionable formative assessments for all the teachers with whom they work? Before determining the fate of major policy reforms, such as teacher evaluation, we should understand why such policies may not have realized their expected potential to improve outcomes.

Schools are complex organizations and many factors influence principals' efforts to improve teaching. At the risk of oversimplification, we delineate a conceptual model of the connections among principals, our focal policies (tenure review and teacher evaluation), and teaching effectiveness (see Figure 1). We focus on the extent to which principals believe they *can* improve teaching effectiveness, which we term "principal agency." Agency is the belief in one's ability to take action in pursuit of reaching a specific goal (Anagnostopoulos & Rutledge, 2007; Coburn, 2016; Donaldson & Woulfin, 2018); in our study, improving teaching effectiveness or shifting the composition of the teacher workforce. Principal agency is a particular form of principal self-efficacy, or a principal's belief in his/her ability to influence various processes and effect change in a school (Federici & Skaalvik, 2012; Tschannen-Moran & Gareis, 2004). Prior research suggests that principals with lower levels of self-efficacy struggle to strategize about methods for improving their schools (Tschannen-Moran & Gareis, 2004). As such, we theorize that agency may serve as a potentially necessary precondition for strategic engagement with and implementation of the teacher tenure review and the annual teacher evaluation policies. Without a belief that they can improve teaching, we hypothesize that principals are unlikely to use the policies in systematic ways to either shift the composition of

their teacher workforce or to promote the development of their existing teachers. Strategic policy actions include the ways in which principals report engaging with these policies, including the frequency of their observations of teachers, the provision of feedback from evaluation and tenure reviews, and their observed strategic retention decisions, including tenure determinations.

{Insert Figure 1 here}

A large body of literature suggests that both structural and relational features of schools influence teaching and learning (e.g., Bryk & Schneider, 2002). As such, we posit that principals' own characteristics and the attributes of their school contexts contribute to their agency and to the strategic policy actions they employ (Ladson-Billings, 2009; Pacheco, 2009). For example, a more experienced principal working in a smaller school where teachers regularly collaborate might well feel more agency over improving teaching effectiveness. In contrast, a novice principal working in a large school with a history of animosity between teachers and school leadership may well feel less agency over teachers. Similarly, a principal's own skills and experiences likely influence their differential agency across contexts. Our goal is to build a more nuanced understanding of how the principal's role in policy implementation processes contributes to outcomes of district policies.

New York City Policies around Teachers

Situating this research in NYC has several advantages. First, NYC is the largest school district in the country, with over 1500 schools. It includes some of the most academically rigorous schools in the country, as well as some of the lowest performing schools. While NYC is unique in some ways, its diversity provides a rare opportunity to explore principal decision making across a variety of contexts. Second, we are able to link the district's rich administrative data on principals, teachers, and students, spanning almost 20 years, to a survey of NYC middle

school principals and detailed interview data with a subset of principals. The NYC context affords us a rare opportunity to connect nuanced principal decision making and strategic actions to an array of administrative variables about principals, teachers, students, and schools.

We ground our exploration of principal agency and strategic action in two district policies that rely heavily on principal discretion and resource management: teacher tenure review and annual teacher evaluation. Beginning in 2009-10, NYC changed the tenure review process, infusing more information and increasing the responsibility and accountability of principals to ensure that teachers met challenging performance standards. For example, tenure decisions in 2009-10 were, for the first time informed by new student learning measures from the Teacher Data Reports (which included teacher value-added), in-class assessments aligned with the New York State standards, and other evidence of student progress (NYC Department of Education, 2009). NYC affords principals the option of approving teachers for tenure, denying tenure, or extending a teacher's probationary period for an additional year. In 2009-10, the district encouraged principals to recommend more teachers have their probationary period extended to allow the teachers more time to demonstrate that they met the performance standards appropriate for tenure.

The reform led to many fewer teachers receiving tenure when they were first evaluated for tenure; the approval rate decreased from 94% in 2009 to 58% in 2011 (Loeb, Miller, & Wyckoff, 2015). Those not receiving tenure typically had their probationary periods extended an additional year (increasing from 4% in 2009 to almost 40% in 2011), and "extended" teachers were much more likely to leave their schools. Schools varied in the prevalence of extended teachers, potentially indicating substantially differential use of the tenure policy.

Since 2012-13, principals in NYC schools have used a system called *Advance* to annually

evaluate all teachers on a four-category effectiveness rating scale (Highly Effective, Effective, Developing, and Ineffective) based on classroom observations and measures of student learning. In the 2014-15 school year, the annual evaluation system shifted to a heavier emphasis on formative, ongoing feedback that teachers could use to improve their practice, rather than the prior summative measures. Classroom observations are now mandated at more regular intervals, and each observation is coupled with specific feedback to teachers provided within 15 days of the observation. While no research of which we are aware has analyzed variation in the implementation of *Advance*, we theorize that principals' agency is associated with their assessment of the evaluation system's usefulness and the strategies they employ to implement it.

NYC's teacher tenure review process and annual teacher evaluation system are designed to infuse more and higher-quality information into principals' decision-making processes. These policies also provide mechanisms by which teachers receive guidance on their weaknesses and benchmark their progress addressing those weaknesses. Do principals perceive their abilities to influence teaching effectiveness differently? If so, are these differences associated with their differential use of these policies? Our analysis addresses these questions which we believe have important implications for understanding the effects of these policies.

Data, Measures, & Methods

Our goal is to understand how principals vary in their agency to improve teaching effectiveness, how agency differs across schools, and whether agency is associated with different approaches to policy implementation. This requires access to data not typically collected by districts. We, therefore, augment rich administrative data on principals, teachers, students, and schools with two primary data sources: a survey of principals, which focuses on their perception of their agency over teaching effectiveness, and in-depth interviews of a subset of principals that

explore these issues in more detail. Taken together, these different measures provide different insights into principal agency and policy implementation from both self-reports and observed actions, affording a more fulsome discussion of our research questions.

Data

Principal Survey. Our principal survey had two goals. First, we sought to measure principals' sense of their ability to improve teaching effectiveness in their school through developing teachers and/or compositional change (retaining effective teachers and attriting ineffective teachers). Second, we wanted to understand principal attitudes toward key teacher policies, and how principals were implementing these. We administered the survey online in the Spring and Summer of 2016 to principals in all NYC schools serving grades 6, 7, or 8 (n = 494). A copy of the survey is found in Appendix A. As an incentive for completing the survey, we gave a $50 gift card to each principal's school. A total of 258 completed surveys were returned for a 52% response rate. Table 1 presents characteristics of the middle schools in the survey sample and the full population.

{Insert Table 1 here}

Principal Interviews. The surveys provided information about both principal agency and the strategies employed around policy implementation from a broad and representative group of middle school principals. To provide greater nuance about *how* and *why* principals made particular decisions around policies, we emailed all the principals who completed the survey and invited them to participate in an additional interview, with an incentive of $100 gift card for their school. Our volunteer interview sample included 45 middle school principals, approximately 19% of the survey sample. This was a convenience sample, and the group of principals we interviewed is not wholly representative of either the survey sample or the total population of

NYC middle school principals (see Table 1). That said, these interviews provide invaluable nuanced insight into how principals thought about policies designed to improve teaching. Principals spoke at length about challenges of working with different populations of teachers and the degree to which policies supported or hindered their efforts at improving teaching.

We conducted all interviews over video-conference, and each interview lasted between one hour and two and a half hours, depending on the level of detail provided by the participating principals. One of the authors, a postdoctoral fellow, and three doctoral students conducted all interviews using a semi-structured interview protocol focused on understanding why and how principals made decisions regarding policy implementation. At the conclusion of each interview, interviewers member-checked notes with each interviewee to insure our interpretation matched the interviewee's interpretation (Creswell & Miller, 2000). A professional transcription service transcribed all recorded interviews.

Administrative Records. The administrative data files we obtained from the NYC Department of Education (NYCDOE) and the New York State Education Department allow us to place principal responses to the survey and interview questions in context. First, the NYCDOE employment records, available from the 1990s to 2016, allow us to observe the work histories of all principals and teachers. Second, the Tenure Notification System files capture all NYCDOE tenure decisions made between 2008 and 2015. Third, the NYCDOE student demographic and assessment files, available from 1999 to 2016, provide us with information on all students in all NYCDOE schools. Fourth, the teacher-student linkage files allow us to match students to ELA and math teachers between 1999 and 2016. Finally, the State's annual School Report Card database and Institution Master Files together with the National Center for Education Statistics' Common Core of Data files provide characteristics of each school.

Measures

Agency. Our measures of principal agency make use of two sets of survey questions which ask the principals to indicate their capacity to increase the overall effectiveness of the teacher workforce at their school (1) by developing individual teachers and (2) by changing which teachers are in the school. Both questions ask about four groups of teachers: pre-tenure and post-tenure teachers who are either below expectations or meeting or exceeding expectations (see survey questions 3 and 4 in Appendix A). Principal responses to these questions characterize agency along two distinct dimensions: the tenure status of the teachers (pre-tenure versus post-tenure) and the performance of the teachers (performance below versus meeting or exceeding expectations).

In creating the agency measures, we sought to discriminate between low and high-agency principals. We calculated two statistics: (1) the percent of questions with a low-agency response ("Not at All" or "Some") to the relevant questions and (2) the percent of questions with a high-agency response ("A Lot").[1] We label a principal as low-agency if he/she provided a low-agency response to at least 75% of the relevant agency survey questions. Similarly, we label a principal "high agency" if he/she provided a high-agency response to at least 75% of the relevant questions. The remaining principals are assigned to the medium agency category.

Strategic Actions. We examine six measures of principal strategic actions for the tenure review process and six measures for the *Advance* teacher development and evaluation system. All these measures are taken from the principal survey with the exception of information on the number of tenure decisions resulting in a teacher's probationary period being extended, which is calculated from administrative data. We list each of these measures in Table 2 and provide descriptive statistics for them in Table B1 in Appendix B.

{Insert Table 2 here}

Principal Attributes and School Context. In linking the surveys to the administrative data, we create measures of the context in which principals work as well as their demographics and professional experience. We observe each principal's gender, race/ethnicity, age, years of experience as the principal at the current school, and whether the principal had previously been a teacher at the school. We characterize each principal's working context with a series of school-, teacher-, and student-level measures. While all schools serve the 6th, 7th, or 8th grades, some schools also serve grades below 6th and/or grades above 8th. We characterize the teacher workforce with which the principal works with average years of teaching experience at the current school, the percent who are on probationary status (do not have tenure), and two value-added measures of teacher performance (the percent of teachers with an ELA value-added score in the bottom quarter of the district-wide distribution and the same for mathematics value-added score).[2] Finally, we capture the characteristics of students at each principal's school by variables that measure the total student enrollment, the racial/ethnic composition of the student body, the percent eligible for free/reduced-price lunch eligible, and their performance on the statewide assessments in mathematics and ELA. Table 1 provides descriptive statistics.

Methods

To answer our three research questions, we employ a variety of descriptive analytic techniques to the survey and administrative data, which we detail below. We augment these analyses with insights gained from the analysis of the principal interviews so as to further elucidate the relationships among the constructs presented in our conceptual framework (Figure 1).

Principal Survey. We begin by developing an understanding of how principal agency varies (**RQ1**) and whether contextual factors may explain that variation (**RQ2**). We examine the distribution of the four agency measures and assess the degree to which they are correlated. Drawing on survey data, we estimate a series of ordered logistic regression models to assess how principal and school characteristics are related to high-agency (**RQ2**):

(1) $Agency_i = \beta + \alpha' Prin_i + \gamma' Schl_i + \theta' Stdt_i + \lambda' Tchr_i$

Equation 1 predicts the degree of agency a principal has as a function of vectors of principal ($Prin_i$), school ($Schl_i$), student ($Stdt_i$), and teacher ($Tchr_i$) characteristics. We estimate this model for all agency measures.

Shifting to how principal agency is correlated with their strategic actions to implement teacher policies (**RQ3**), we estimate regressions similar to those specified in equation 2 where we predict a strategic action as a function of a principal agency measure, principal characteristics, and the school context.

(2) $Action_i = \beta + \delta_1 Low_i + \delta_2 High_i + \alpha' Prin_i + \gamma' Schl_i + \theta' Stdt_i + \lambda' Tchr_i$

In these models, the coefficients of key interest are those for the indicators for low and high agency (δ_1 and δ_2, respectively) which both measure differences in strategic actions relative to medium agency principals. We conduct a Wald test on the equivalence of δ_1 and δ_2 to assess whether low and high-agency principals differ in their strategic actions. We specify equation 2 as an ordered logistic regression for those action measures based on survey questions with a discrete response scale and as an ordinary least squares regression for continuous action measures.

A goal of these analyses is to develop hypotheses about how principal agency drives policy implementation and improvements in teaching effectiveness, which can be rigorously

tested in future analyses that can exploit ignorable variation in principal assignment and principal agency to schools. The promise of our hypotheses is dependent on our choice of covariates characterizing the school context. We therefore include student performance and teacher value-added scores in the year before the principal assumed their position at the school. As 20% of principals in our sample are their school's founding principal and are thus excluded from models with performance measures, we present results from models with and without these performance measures.

Principal Interviews. We analyzed interviews in several stages. During stage one, the research team read all the interviews and generated a list of codes stemming from our conceptual framework and factors identified in the survey and administrative data (Guba & Lincoln, 1994). These included structural codes about policies and the principal's background experiences and thematic codes about how the principal perceived the teachers in his/her school. Given our research questions, we also developed a series of thematic codes focused on the principal's conception of his/her role and perceptions of agency over different populations of teachers. We created initial definitions and decision rules for each code and compiled them in a codebook used by the team throughout the analysis. We revised the codebook in bi-weekly meetings based on emerging themes and questions. The team of five raters finalized codes when the raters reached 80% inter-rater agreement on all codes (Miles, Huberman, & Saldaña, 2013).

During the second stage of analysis, we coded all interviews using Dedoose software. A team member who did not conduct the interview coded each interview, increasing team-wide exposure to low-inference data. Interviews were coded at the stanza level, which consisted of question-answer exchanges and relevant follow-up questions. Any codes applied to the stanza captured the full exchange between the participant and interviewer (Saldaña, 2013). Fifteen

percent of all interviews were double coded with more than 85% agreement across all codes (Miles et al., 2013).

We then engaged in an analytic memoing process. Using multiple passes through the coded data by two or more researchers, we created a memo for each principal, systematically analyzing all coded instances across the interview and rereading the interview as a whole (Dyson & Genishi, 2005). We organized memos around our three research questions, paying attention to confirming and disconfirming evidence (Creswell & Miller, 2000).

After completing the coding and memoing process, we tagged each interview with characteristics of the school and principal, culled from the administrative and survey data. Descriptors included principal agency from the surveys, strategies reported in survey, school characteristics and principal characteristics. This allows us to connect our interviews to the analysis of the survey responses to provide fuller, more nuanced answers to our three research questions about principal agency to improve teaching effectiveness.

Results

Our results are organized by research question. We begin by examining the distribution of our principal agency measures, and then analyze whether principal agency can be explained by principal attributes and school context. With a better understanding of principal agency, we conclude by correlating agency with the strategic actions principals use in the implementation of the tenure review process and the *Advance* teacher evaluation system.

Principal Agency Over Different Groups of Teachers

RQ1: To what extent do principals perceive they have agency to influence the teaching effectiveness in their schools? How does agency vary by the attributes of teachers? Principals differ in their agency for improving teaching effectiveness: some feel empowered and

capable of shifting the composition and facilitating the development of the teachers they work with; others report feeling less able to affect such change (Figure 2).

{Insert Figure 2 here}

Principals indicate much greater agency over the improvement of pre-tenure teachers than over post-tenure teachers and over the improvement of teachers who meet or exceed their expectations than teachers whose performance is below their expectations.[3] As shown in Figure 2, fewer than half as many principals indicate high-agency over post-tenure teachers compared to pre-tenure teachers, and almost three times as many principals express high-agency over teachers meeting or exceeding their expectations than teachers not meeting performance expectations.

Interviews corroborate these survey results. Principals detail divergent perceptions of different populations of teachers. Many suggest they are better able to support the development of some groups of teachers than others groups. Several principals note that the weaker, post-tenure teachers at their schools are impervious to all district efforts at improvement. Principals discuss the relative ease of developing teachers prior to the consequential tenure decision, when they are "impressionable" and "open," and they recount struggling to work with already tenured teachers who they feel they can neither remove nor, in many cases, improve. One high-agency principal summarizes the particular benefits of working with pre-tenure teachers:

> "I actually have embraced this idea of hiring first-year teachers. You don't just find veteran, experienced teachers looking for a brand new job in the South Bronx. I think we've designed the system around very heavily supporting first and second year teachers. Now, as we've done it, we sort of feel like, 'Hey, those are actually the people who become our superstar teachers,' because they didn't have any bad habits yet or anything else. . . Because they don't know anything yet, they're really open to learning. And if they don't work out, we can tell them after one or two or three years. Once people get tenure, it becomes much more difficult."

For this principal, and many others interviewed, it becomes much more challenging to use either compositional change or development strategies to improve the teaching effectiveness of the post-tenure teacher workforce.

It is also important to note that a small group of principals surveyed did express high agency over post tenure teachers and those not meeting expectations. Along the same lines, there are principals we interviewed who articulate a clear commitment to fostering ongoing improvement of post-tenure teachers. These principals discuss the need to make tenure a meaningful milestone, but to also support the development of more experienced teachers. One principal articulates the need to support ongoing growth for post-tenure teachers:

> "Our veteran and also our effective teachers, our strong teachers, appreciated having feedback more than anybody else in the building. 'Cuz generally they get left out like, 'Oh, you're not on my priority list. Then they're the ones that are just so ready to develop. I think I read a study once about people leaving the profession, that one of the number one reasons why they left is that they felt that they were in isolation, and they weren't challenged anymore. I could see that, 'Okay, you've reached the threshold. Now we're not worried about developing you anymore.'"

This refrain that experienced teachers also need support and actionable feedback is common across a group of high-agency principals we interviewed. One describes teaching as "a journey not a destination. 'Cause the bottom line, this doesn't stop when you get tenure. The expectation is you have to maintain that and grow." Another high-agency principal always moves post-tenure teachers to a new grade because "they sometimes get lazy," but often "just need a little push" to not stagnate but rather to always develop and improve. Another principal requires post-tenure teachers serve as new teacher mentors or "model teachers" to create a sense "that there's always a ladder within our building, where good people can get better and be great." In interviews and surveys, some principals articulate high levels of agency over all the teachers with whom they work.

Our analyses make clear that principals' feelings of agency vary based on the tenure status and performance of the teacher. On average, principals express less agency over teachers they perceive to be weaker, or not meeting their expectations, who are also those most likely in need of support from school leadership. Principals also express a greater sense of agency over pre-tenure teachers, with lower agency over teachers who are already tenured. Given that the vast majority of teachers are post-tenure (75%), this may have important implications for policies designed to evaluate and improve all teachers, regardless of their performance and tenure status.

Principal Agency, Principal Attributes, and School Context

RQ2: Does principal agency vary systematically with the attributes of principals and of the schools they lead? Given that principals vary in their agency, we wanted to understand more about what contributes to this variability. For each of the four agency measures, we estimate ordered logistic regressions with and without student and teacher performance measures captured in the year prior to the principal's arrival at the school (Table 3). Across these models, none of the principal characteristics (age, gender, race/ethnicity, years principal at the school, and whether taught at the school) are significant predictors of any of the agency measures; nor are the school characteristics (grades served and borough), the percent of students eligible for free or reduced-price lunch, or the student and teacher performance measures (the percent of students proficient in neither math nor ELA, the percent of teachers with value-added below the 25th percentile, and the percent of teachers with value-added below the 25th percentile). There are a few exceptions. Principals in schools with higher percent of black students tend to report lower agency over pre-tenure teachers and teachers performing below expectations. Principals in schools with higher percent of Hispanic students tend to report lower agency over pre-tenure teachers and teachers meeting or exceeding expectations. Finally, principals in larger

schools tend to report lower agency over teachers meeting or exceeding expectations.

{Insert Table 3 here}

Though there are no systematic relationships between contextual variables and agency across the survey sample, many principals detail in interviews how their school's contextual factors circumscribe their perceived agency, though also not in systematic or readily quantifiable ways. Several principals point out that their ability to shift the composition of their teacher workforce is limited by their perceptions of the teacher labor market, the desirability of the school for students and teachers, and superintendent support. For example, one high-agency principal noted "there's a teacher shortage, but it's different for me because I'm in one of the most fantastic buildings, and it's not because of me. It's just a really nice location, really nice families, really good scores, really great teachers. Some schools, if they lose a teacher who's average, all they can get back is a sub-average teacher." In contrast, several low-agency principals discuss lowering expectations for teachers because of what they perceive to be a lack of otherwise qualified applicants to their schools.

Principals describe district superintendents as a key contextual factor contributing to how much agency they feel around compositional change at their school. Some note feeling hamstrung by district regulations, suggesting that making tenure decisions "sometimes feel like a numbers game." Others suggest the superintendent is the one with the power — "ultimately, it is not my decision" — and that they could not go against the superintendent's decision:

> "Again I have to present an argument to the superintendent if I've seen the growth, but the superintendent also recommends on her own. Like there was a teacher I felt that his practice was growing and the superintendent says, 'It's not enough for me' I can't go against what the superintendent says."

Others feel more agency because they are "extremely supported" by their superintendent and have "aligned expectations" within the district. Another details: "Our district is very, very

coherent. . . the principals we do walkthroughs with each other in different buildings, and everybody is pretty much doing it a little bit differently, but overall we are moving teacher practice not just as a school, but as an entire district." Others acknowledge the central role of district superintendents but still feel a sense of control in shaping the teacher workforce in their school. For example, one notes "each superintendent approaches [this] really differently. Part of it is learning the politics of how they are going to make the decision." With this knowledge, the principal can present a case in such a way that the superintendent's decision is likely to match the principal's preference. Overall, we find only minor systematic differences in principal agency across principals and schools with different characteristics in the survey data. In interviews, principals did attribute their agency to more nuanced contextual factors, including central office leadership and support.

Principal Agency and Strategic Policy Implementation

RQ3: Do principals with high agency use different strategies to implement the policies in service of their goals? To address this issue, we analyze the relationship between principal agency and strategic policy actions around tenure and *Advance* evaluations, using both survey and interview data. We test these relationships in our survey data with two models, with and without controls for student achievement and teaching effectiveness at the school the year prior to the principal's arrival. Both models control for student, school, and principal attributes. To dig deeper into these relationships, we also conduct supplemental analyses using these same two model specifications. We focus on agency over pre-tenure teachers and teachers performing below expectations in our analysis of the tenure review process given the policy's design. Given that all teachers participate in the *Advance* teacher development and evaluation system each year, we examine all four agency measures (pre- and post-tenure teachers, teachers meeting or

performing below expectations). We then triangulate patterns in our survey data with those culled from the interviews.

Teacher Tenure Review. Principals who indicate they have low-agency to improve the effectiveness of pre-tenure teachers make more use of extensions than do high-agency principals (Table 4). Having extended a teacher's probationary period, however, high-agency principals then leverage the extension period in ways more in keeping with the policy design than do low-agency principals. Principals are encouraged to use the extension option for teachers who may not currently meet performance expectations but show the potential to do so, when given additional supports. High-agency principals are more likely to provide extended teachers supports and, alternatively, to counsel extended teachers out. Principals with high-agency over teachers performing below expectations report counseling out significantly more teachers than low-agency principals. Agency is not significantly related to the other strategic actions for implementing teacher tenure review (see Table B5 in the appendix).

{Insert Table 4 here}

For principals to leverage the tenure review process to improve teaching effectiveness, they must be comfortable with the system's expectations for their role in that process. Principals are assigned control of the tenure review process in their schools; yet, low-agency principals feel significantly less control than high-agency principals (columns 1 & 2, Table 5). Principals are expected to gather the requisite information to make a tenure recommendation during the typical three-year probationary period. Low-agency principals, however, are less likely to report having sufficient information to make a tenure decision (columns 3 & 4) and are less likely to indicate that the three-year probationary period permits an accurate assessment of teachers (columns 5 & 6).

{Insert Table 5 here}

The interviews provide support for these findings. High-agency principals come across as decisive leaders who report knowing someone is "not meant to be a teacher" fairly early in their career. All but two of the high-agency principals interviewed note that they counsel out ineffective teachers well before a tenure decision, making statements such as "the children shouldn't have a third year of this." They report being very direct with teachers, making plain "this is not the career for you."

These principals' sense of agency and comfort with authority is reflected in their discussion of the tenure review process. Unlike the low-agency principals who report feeling constrained by the superintendent's decision-making authority around tenure, the high-agency principals feel comfortable articulating their central role in the tenure process. One principal notes:

> "Sometimes principals are afraid to have the real conversation about why you're not giving someone tenure. Make it around these technical things and defer to superintendents like, 'The superintendent was in your room and said this,'— In my mind, if you really sit down with the teacher and say, 'Here's what's keeping *me* from giving you tenure,' and then the person, if you're really willing to invest in them and work with them, they will turn that around. Then at the end of that, they'll be better"

The common theme across the high-agency principals is the need for directness and clarity with teachers about the extension decision, coupled with additional supports. Principals report telling extended teachers "if you continue performing at this rate, I will never recommend you for tenure," and "if you don't get [tenure] in four years, you're not meant to be a teacher." At the same time, the principals are equally forceful about the need for supports for extended teachers because extra time alone is unlikely to realize improvement. One described, **"**let's give it one more year, but let's really push for progress…Let's figure out the specific things you need to improve and make sure we help you get there." Principals with high agency describe using

tenure extensions to clearly signal the need for continued improvement, while using the time strategically to target areas for growth.

In contrast, the low-agency principals are more passive about the tenure process and the use of extensions, with less clarity about why they extend teachers and/or what they do to support those who are extended. One goes so far as to say "it's not totally clear to me how tenure even works," and many focus on the procedural elements of the tenure review, such as collating tenure binders. Several low-agency principals put the onus on the extended teachers to develop strategies for improvement: "We would allow the teachers to take on professional development in the areas to support their own growth, but they need to identify those"; "They do know if they have any issues, they can e-mail an administrator." When asked how she supports teachers who have been extended, one principal responds, "it's up to the teacher to look for the support. We can just do so much, so I also want to see if the teacher's taking any initiative." The low-agency principals describe their role in the tenure process, both before and after extensions, as less directive and less supportive. Collectively, the survey and interview data suggest high-agency principals are better able to leverage the tenure review process as it was designed: to improve teaching effectiveness in their school through both the development of extended teachers and the differential retention of teachers, based on their perceived effectiveness.

Teacher Evaluation System. The centerpiece of NYC's evaluation system is the feedback provided to teachers following observations of their classrooms conducted by principals, assistant principals, and superintendents. Scheduling both the observations and meetings to provide the feedback for all teachers requires logistical prowess. Principals have limited time during the school week to ensure they gather sufficient information about teaching effectiveness while also carrying out all other leadership responsibilities.

Our data reveal that high-agency principals strategically allocate their time and resources in the provision of feedback. We measure feedback by the number of conversations principals have with each of four specific subgroups of teachers (pre- and post-tenure teachers, teacher meeting or performing below expectations) about their instructional practice. Principals who express more agency over a given group of teachers have more conversations about instruction with those teachers than do low-agency principals (Table 6). For example, principals with high agency over teachers performing below expectations have more conversations with teachers performing below expectations than principals with low-agency over this group of teachers (bottom panel, columns 1 and 2). The same is true for pre- and post-tenure teachers (top panel) and teachers meeting or exceeding expectations (bottom panel, columns 3 and 4). Principals strategically allocate their time so as to have more interactions with teachers whom they believe they can influence.

{Insert Table 6 here}

We also ask principals about the number of hours they spend observing and providing feedback to teachers. However, we did not ask for hours separately by pre- and post-tenure teachers and teachers meeting or performing below expectations, limiting the value of these data. The results indicate that high-agency principals spend *less* time on these activities in a typical week than low-agency principals (Table B6 in the appendix).

Interview data support the survey findings that agency is associated with different implementation approaches to the teacher evaluation and development system, *Advance.* In interviews, low-agency principals also describe "doing more" observations and feedback, rather than strategically allocating time and resources to provide feedback to teachers in ways that maximize the feedback's impact. This was evident in comments such as "I am in classrooms a

lot" and "I do all the *Advance* observations, every single one, so teachers know that I have my finger on the pulse." The low-agency principals do not describe a particular strategy to engaging in observations and feedbacks. The general approach is one of 'more is more'.

As with the teacher tenure review, high-agency principals report being more confident than low-agency principals in their ability to meet the teacher evaluation system's expectation that they provide useful, honest, and concrete feedback to teachers about their classroom performance. We present the results for agency over pre-tenure teachers in Table 7, although the findings are consistent across the measures of agency over post-tenure teachers, teachers meeting expectations, and teachers performing below expectations. Compared to low-agency principals, there are fewer teachers with whom high-agency principals feel it is challenging to discuss content-specific issues (top panel, columns 1 and 2), to identify concrete steps to improve the teacher's practice (top panel, columns 3 and 4), and to provide negative feedback about the teacher's teaching (bottom panel, columns 1 and 2). High-agency principals also worry less that providing negative feedback will undermine their relationships with other teachers (bottom panel, columns 3 and 4).

{Insert Table 7 here}

High-agency principals foreground the system's utility for formative feedback. As one high-agency principal articulates, "If you look at it as purely an evaluation tool, I think it's extremely effective, but the really critical thing is not necessarily an evaluation but a tool for supporting growth." Others echo the sentiment that *Advance* provides invaluable formative, rather than summative information about teacher performance, "I think that's the best thing about *Advance* is showing what I can do as a building leader to help [teachers] become better at what they do." A common theme across these interviews is the district mandated observations of

teachers are helpful, but not sufficient for leveraging improvement. Many high-agency principals say that the observation requirements for *Advance* are "inadequate" and that the bar for "effective practice" is far too low. That said, these principals are still able to use *Advance* in strategic ways to support their own goals. Most say they observe teachers far more than the parameters stated in *Advance,* but note their "typical observations" are often much shorter than the *Advance* requirements, perhaps further clarifying the survey findings. Another high-agency principal tells her teachers that *Advance* encourages "informal, unannounced observations" (though the policy does not specify this particular approach), and this encourages the need to be "ready every day of the year." One high-agency principal says they "only needed 1-2 minutes to know if a teacher was engaged in effective instruction" and that "pop-ins" are the most efficient way of gathering information. Again, high-agency principals express a decisiveness and strategic use of time in policy implementation.

In contrast to the low-agency principals who report maximizing their observation time writ large, many of the high-agency principals suggest "being really thoughtful and careful about what [they] need to do and what could be done equally well, maybe even better, by someone else." Others report working around the policies to make them better align with their own theories about teacher learning. "We basically are tryin' to fit *Advance* into the system that we really use, which is frequent observations from teacher leaders in classrooms." The principal makes plain that when teachers are "only observed for *Advance*, it just feels like stupidness, but the language of the *Advance* and the teaching skills highlighted in *Advance* are incredibly helpful." The principals suggest that the feedback they provide to teachers based on the observations are what made *Advance* "work" in service of their broader vision of instructional improvement. One principal notes that "teachers are the most important investment that we

make, so the feedback has to be very, very strategic and actionable." All the high-agency principals echo that feedback, rather than observations, are the true lever for improvement, but that having a system for observation and feedback provision has been a useful tool for their instructional leadership.

"Principal discretion" in policy implementation is common across the high-agency principal interviews, echoing work by Donaldson and Woulfin (2018) in Connecticut. Many high-agency principals describe using the policies to advance their own agendas for their schools, and suggest that tenure and *Advance* work in tandem with other systems and policies to affect teacher improvement. For instance, *Advance* is described as a tool and framework for informing coaching, new teacher mentoring, and ongoing professional development efforts. One expresses this most clearly, "you're asking me about the policies, like they are their own, separate things, but like *Advance* and all those rubrics are just a tool for helping me get all my teachers better every single day." Instead of implementing *Advance* as a discrete system for assessing teachers at the end of each school year, these principals report using the observation rubrics as ongoing frameworks for high-quality practice and useful tools for promoting more formative conversations about instructional improvement.

The survey and interview data are consistent: high-agency principals take different strategic actions than low-agency principals to implement these district policies to improve teaching effectiveness. It is possible, however, given the self-reported nature of the data, that the differences are all a perception of the principal with no real differences. While we are unable to test this directly, teachers, on the district's 2015-16 school survey, rate high-agency principals' leadership more favorably than low-agency principals' leadership (Table 8). This is suggestive

evidence that effective principal leadership is positively associated with principal perceptions of their agency to improve teaching effectiveness.

{Insert Table 8 here}

Discussion and Implications

Over the last decade policymakers, practitioners, and researchers have embraced a variety of reforms intended to improve teaching effectiveness. Without exception, these reforms, while at times demonstrating pockets and periods of success, have failed to realize their goals when implemented at scale. This lack of success has typically been identified as a failure of policy design, with associated recommendations to abandon the policy approach. A rich literature in policy implementation (Fixson et al., 1995) and recent research on implementation of teacher evaluation specifically (Donaldson & Woulfin, 2018; Marsh et al., 2017; Stecher et al., 2018) suggests this may be the wrong diagnosis. The policy itself may be effective, if it is well-resourced and embraced by practitioners (see, for example Dee & Wyckoff, 2015). This paper explores this proposition with a focus on the role that principals play in two prominent policies intended to improve teaching effectiveness.

Consistent with a large body of literature, we hypothesize that unless principals believe they can improve specific aspects of teaching effectiveness in their schools, they are unlikely to engage in strategic actions around policy implementation. Our analyses find that principals express differential agency over specific activities associated with improving teaching effectiveness. In general, principals felt less agency over improving post-tenure teachers and those whose effectiveness falls below expectations, however, even in this case a group of principals perceive they can be effective. In addition, we find that agency is not systematically associated with characteristics of principals or the schools in which they work, which is

consistent with prior research (Tschannen-Moran & Gareis, 2007). Finally, we find that principal agency is associated with principals' actions to improve teaching effectiveness. High-agency principals engage in activities associated with improvements in teaching effectiveness much more frequently than low-agency principals.

High and low-agency principals also have quantitatively and qualitatively different approaches to policy implementation. High-agency principals report using the policies in service of their goals, getting information quickly, and making decisive personnel decisions. High-agency principals report that they use their time more efficiently in both the tenure process and *Advance* evaluation systems. They are more likely to counsel out weaker teachers before the time-consuming tenure review process. They leverage extensions of the tenure probationary period in strategic ways to signal the need for improvement and provide the supports to help realize these improvements. In contrast, across surveys and interviews, low-agency principals report struggling to gather information quickly, facilitating hard conversations with weaker teachers, and determining clear steps to promote improvement for those teachers.

Our analysis has some limitations. First, the analysis has external and internal validity limitations. The analysis reflects the beliefs and behaviors of NYC middle school principals around two teacher policies. The findings may not generalize to other settings or policies. Nor do we believe this analysis has a strong causal interpretation. By including a variety of controls in our regression analysis we attempt to limit explanations that compete with principal agency for explaining for differences in various actions linked to the policies. So, although we rule out some competing explanations, we caution that explanations other than principal agency may account for some of the relationships we explore.

Second, our analysis provides little insight on what contributes to the meaningful differences in agency we observe across these principals. We find these differences are largely unrelated to characteristics of principals or their schools that we observe. Understanding the causes of differences in agency may have important implications for improving agency among principals. It appears that understanding these differences will require primary data collection that augments administrative data.

Finally, our analyses do not examine the effects of principal agency on outcomes of the policies, e.g., changes in teaching effectiveness through compositional change or development of current teachers. This is an important analysis, which is an important next step for our research in NYC. Because we know so little about how principals implement policy, we chose to broadly describe what we viewed as key elements of a theory of change that connect the design of two important policies intended to improve teaching effectiveness to their intended outcomes. We believe the exploratory analysis presented in this paper is a necessary first step by documenting important descriptive patterns.

Developing an effective teacher workforce is the most productive mechanism to improving student outcomes. We believe the results presented in this paper have important implications for policies related to teaching effectiveness, for policies shaping the skills of principals, and for future research related to principals. First, our results provide rich detail regarding reasons that policies may not realize their potential. Unless those charged with implementing policies embrace those policies, it is unlikely the mechanisms necessary for success will function as planned. Principals who do not believe they can shape the pre-tenure workforce do not take actions to improve the effectiveness of their pre-tenure teachers. The evidence that high-agency principals are more comfortable leveraging evaluation data to provide

formative feedback is critical, given prior work that suggests formative feedback from evaluation is key in leveraging teachers improvement (Taylor & Tyler, 2012) and student performance gains (Steinberg & Sartain, 2015). Before concluding that teacher evaluation is ineffective and a waste of time and money we should better understand the reasons for this outcome.

Second, there is a growing literature on the importance of specific principal skills to alter school environments to realize improved student outcomes. Our findings show how principal agency is a crucial component of this skill set. Without a sense of agency principals see policies not as opportunities to affect their strategic goals around teaching effectiveness but rather as another mandate with which they must unproductively comply. The findings have implications for both principals and those responsible for their training and development. Principals, those responsible for principal training, and their superintendents once they become principals can use these results to influence principal development and selection.

Additional research is necessary to more fully understand how to select and train principals who strategically embrace policies to improve the quality of instruction in their buildings. Additional descriptive research would provide a sense of whether our findings generalize to other contexts. Ultimately, rigorous causal research will provide insights on the malleable skills of principals that are most effective in successfully implementing and sustaining policy.

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[1] We collapsed the first two response categories as very few principals responded "Not at All". We recoded responses of not applicable to missing.

[2] We estimated value added scores separately by subject and year by regressing student test scores on prior test scores (same and opposite subject), student demographics (gender, race/ethnicity, eligibility for free/reduced-price lunch, whether English spoken at home, ELL status, disability status, and whether changed schools), lagged student absences, grade fixed effects, and teacher fixed effects. We then impose Empirical Bayes shrinkage and standardize the resulting value-added scores within subject and year.

[3] While principals varied in their agency over different populations of teachers, principals who feel greater agency with one set of teachers tend to feel greater agency over other sets of teachers (Table 3). Nearly all principals who feel the inability to improve pre-tenure teachers also question their ability to improve post-tenure teachers (84.6%). Among principals who indicate high agency to improve post-tenure teachers, most also believe they can improve pre-tenure teachers (73.3%), and almost all principals (92.3%) who express low-agency over teacher meeting or exceeding their expectations also express low-agency over teachers performing below their expectations. And among principals who feel high agency to improve the performance of a teacher not meeting their expectations, most (87.5%) also are confident in their ability to improve the performance of teachers meeting or exceeding their expectations.

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Figure 1. Conceptual Framework

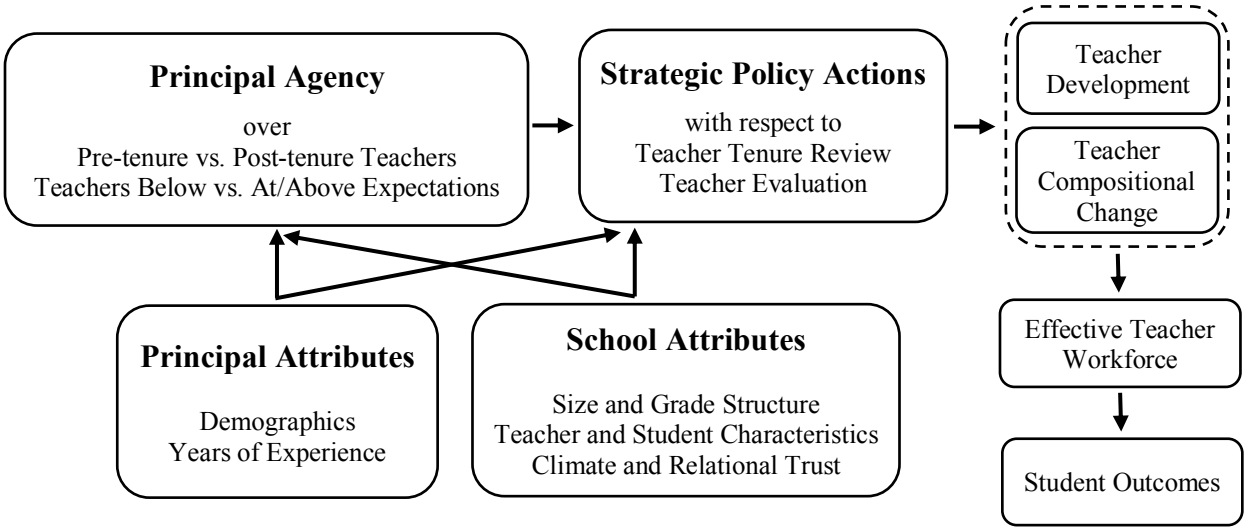
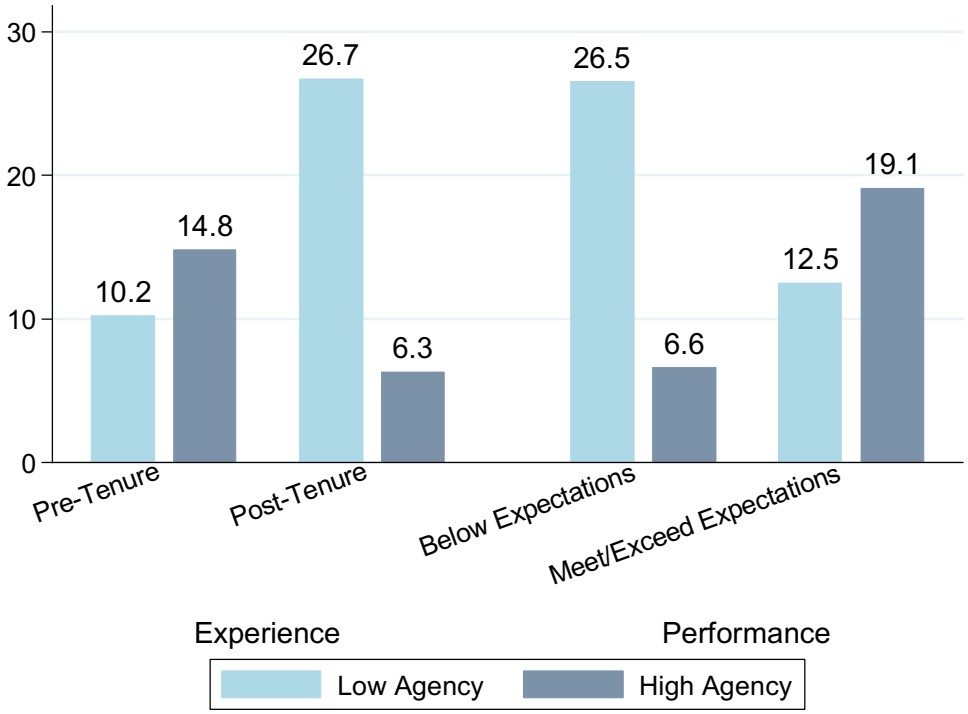


Figure 2. Share of Principals Reporting Low or High Agency, by Agency Measure



Source: Appendix Table B2

Table 1. Characteristics of NYC Middle Schools by Data Source

	All Middle Schools			Surveys			Interviews		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
School Characteristics									
Serve grade below 6th	494	28.7	45.3	258	28.7	45.3	45	17.8	38.7
Serve grade below 8th	494	17.4	38.0	258	12.4	33.0	45	22.2	42.0
% Teachers who Applied for a Transfer (2013-14)	483	11.1	14.1	253	10.4	14.2	45	17.9	23.9
Principal Characteristics									
Age	491	46.5	8.9	258	47.8	8.5	45	46.2	8.6
Hispanic (%)	491	16.7	37.3	258	17.1	37.7	45	11.1	31.8
White (%)	491	50.1	50.0	258	52.3	50.0	45	68.9	46.8
Black (%)	491	29.3	45.6	258	27.1	44.6	45	15.6	36.7
Female (%)	491	59.9	49.0	258	58.1	49.4	45	62.2	49.0
Years as Principal at the School	494	5.4	4.4	258	5.4	4.5	45	5.9	4.1
Principal Taught at the School (%)	499	19.2	39.5	258	20.5	40.5	45	15.6	36.7
Teacher Characteristics									
Average Teacher Experience	494	6.2	3.1	258	6.5	3.1	45	5.4	3.1
% Teachers on Probationary Status[a]	494	29.7	18.1	258	27.9	17.8	39	34.4	20.3
% Teachers Below the 25th Percentile in Math[b]	365	25.4	22.9	206	23.3	20.6	29	21.3	18.0
% Teachers Below the 25th Percentile in ELA[b]	361	23.6	21.6	204	23.2	21.7	29	19.6	18.1
Student Characteristics									
% Black	493	32.1	27.6	257	29.0	27.2	45	25.8	24.4
% Hispanic	493	41.9	26.2	257	43.0	26.5	45	49.4	24.5
% Free/Reduced-Price Lunch	493	73.6	19.4	257	74.4	19.0	45	77.2	15.7
School Enrollment (100s)	489	5.9	4.0	258	6.2	4.3	45	6.7	4.5
% Students Proficient in ELA	492	11.0	5.1	257	10.7	4.7	45	11.0	5.8
% Students Proficient in Math	492	7.0	4.9	257	7.2	5.0	45	6.8	4.6
% of Students Proficient in Neither Math or ELA[b]	370	52.4	26.5	206	52.4	26.9	30	46.8	23.4

[a] Only determined for individuals who took the survey

[b] Measured the year before the principal arrived at the school

Table 2. Measures of Principal Strategic Actions for Policy Implementation

Strategic Action (Source)	Values [a]	Mean (S.D.)
Teacher Tenure Review		
Percent of tenure decisions resulting in the extension of teacher's probationary period since 2010-11 (administrative data)	0 to 100	34.6 (24.5)
Number of additional observations, above the required three, conducted of a teacher up for an initial tenure decision (Q10)	0, 1, 2, 3 or more	1.3 (1.2)
Number of additional observations, above the required three, conducted of a previously extended teacher up a follow-up tenure decision (Q13)	0, 1, 2, 3 or more	1.4 (1.2)
Number of teacher principal whose probationary period principal extends because the probationary period was insufficient to accurately assess the teacher (Q17e)	None, Some, Most, All	1.0 (1.0)
Provides additional supports (e.g. mentoring, coaching) to teachers having their probationary period extended and/or counsels these teachers to leave the school (Q21a, Q21b)	Did neither, Did one, Did both [b]	1.0 (0.5)
Number of teachers the principal counseled out of his or her school over the last three years (Q23)	0, 1-2, 3-4, 5 or more	1.6 (1.1)
Teacher Evaluation		
Number of hours during a typical week in winter the principal spends observing teachers in their classrooms for *Advance* (Q5)	0 to 40	11.1 (11.0)
Number of hours during a typical week in winter the principal spends giving teachers feedback for *Advance* (Q5)	0 to 40	10.3 (11.5)
Frequency of conversations (for at least 5 minutes) with pre-tenure teachers about their instructional practice (Q8a, Q8b)	Never or A few times a year, Once a month, More than once a month [c]	2.2 (0.8)
Frequency of conversations (for at least 5 minutes) with post-tenure teachers about their instructional practice (Q8c, Q8d)		2.1 (0.8)
Frequency of conversations (for at least 5 minutes) with teachers who you generally consider to be ineffective or developing about their instructional practice (Q8a, Q8c)		2.3 (0.8)
Frequency of conversations (for at least 5 minutes) with teachers who you generally consider to be effective or highly effective about their instructional practice (Q8b, Q8d)		2.0 (0.9)

[a] See appendix Table B1 for more information on the distribution of these measures.
[b] The "Don't Know" response was recoded as "No".
[c] Each of these measures averaged together two items from survey question 8 and rounded down to create the measured analyzed.

Table 3. Selected Coefficients from Ordered Logistic Regression Models of Principal Agency

	Dimension: Experience				**Dimension: Performance**			
	Pre-Tenure		**Post-Tenure**		**Below Expectations**		**Meet/Exceed Expectations**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
% Students	-0.017^{+}	-0.027*	0.001	-0.007	-0.011	-0.024*	-0.008	-0.012
Black	(0.009)	(0.012)	(0.009)	(0.011)	(0.009)	(0.011)	(0.009)	(0.012)
% Students	-0.026*	-0.036*	0.001	-0.010	-0.005	-0.016	-0.017^{+}	-0.024^{+}
Hispanic	(0.011)	(0.014)	(0.010)	(0.012)	(0.010)	(0.013)	(0.010)	(0.013)
Enrollment	-0.017	0.004	-0.038	-0.011	0.013	0.034	-0.090*	-0.068
	(0.043)	(0.049)	(0.039)	(0.044)	(0.040)	(0.044)	(0.040)	(0.045)
Perf. Included		x		x		x		x
Observations	255	202	255	203	256	203	255	202
Pseudo R^2	0.057	0.072	0.017	0.025	0.021	0.036	0.049	0.079

Standard errors in parentheses. All models also included percent of students eligible for free/reduced-price lunch, school characteristics (grades served and borough), and principal attributes (age, gender, race/ethnicity, years principal at the school, and whether taught at the school). The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. No coefficient on any of these covariates was statistically significant.
+ $p<0.1$, * $p<0.05$

Table 4. Selected Estimated Coefficients from Regression Models of Strategic Actions for Teacher Tenure Review

	(1)	(2)
Probationary Period Extension Rate		
Low Agency: Pre-Tenure	0.109^{+}	0.065
	(0.059)	(0.063)
High Agency: Pre-Tenure	-0.028	-0.088^{+}
	(0.045)	(0.051)
F-test: High v. Low Agency	+	*
Observations	208	158
R-squared	0.155	0.249
Offered Extended Teachers Additional Supports and/or Counseled Them Out		
Low Agency: Below Expectations	-0.645	-0.566
	(0.514)	(0.643)
High Agency: Below Expectations	0.537	2.089^{+}
	(0.911)	(1.227)
F-test: High v. Low Agency		*
Observations	118	92
Pseudo R-squared	0.089	0.197
Number of Teachers Counseled Out		
Low Agency: Below Expectations	-0.461	-0.583^{+}
	(0.280)	(0.309)
High Agency: Below Expectations	0.991*	0.887
	(0.505)	(0.577)
F-test: High v. Low Agency	**	*
Observations	252	199
Pseudo R-squared	0.050	0.062
Performance Included		x

Standard errors in parentheses. All models also included student, school, and principal attributes. The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. See Table B1 in the appendix for descriptive statistics and survey question wording for these measures.
+ p<0.1, * p<0.05, ** p<0.01

Table 5. Selected Estimated Coefficients from Regressions of Principal Views on their Role in Implementing Tenure Review Process on Agency over Pre-Tenure Teachers

	I have control over the tenure decision process.		**I had the information I needed to make tenure decisions.**		**The current probationary period allowed for an accurate assessment of teachers.**	
	(1)	(2)	(3)	(4)	(5)	(6)
Low Agency	-1.122**	-1.070*	-1.849***	-2.379***	-1.044*	-1.379**
	(0.411)	(0.450)	(0.449)	(0.516)	(0.406)	(0.449)
High Agency	-0.274	-0.035	0.312	0.441	0.252	0.822+
	(0.355)	(0.428)	(0.368)	(0.440)	(0.354)	(0.433)
F-test: High v. Low	+	+	***	***	*	***
Observations	240	190	239	189	238	188
Pseudo R-squared	0.046	0.051	0.081	0.122	0.042	0.067
Performance Included		x		x		X

Standard errors in parentheses. All models also included student, school, and principal attributes. The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. See Table B4 in the appendix for descriptive statistics and survey question wording for these measures.
+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001

Table 6. Selected Estimated Coefficients from Regressions of the Number of Conservations with Specific Subgroups of Teachers about Their Instructional Practice on Principal Agency for that Subgroup

	(1)	(2)	(3)	(4)
	Dimension: Experience			
	Pre-Tenure		**Post-Tenure**	
Low Agency	-0.557	-0.563	-0.446	-0.609+
	(0.441)	(0.478)	(0.280)	(0.311)
High Agency	0.431	0.405	0.519	0.441
	(0.372)	(0.430)	(0.560)	(0.618)
F-test: High vs. Low Agency	+		+	
Observations	248	196	253	201
R-squared	0.072	0.071	0.072	0.079
	Dimension: Performance			
	Below Expectations		**Meet/Exceed Expectations**	
Low Agency	-0.733*	-0.831*	-0.214	-0.320
	(0.298)	(0.332)	(0.383)	(0.426)
High Agency	1.000	1.305	0.617+	0.655+
	(0.715)	(0.810)	(0.326)	(0.377)
F-test: High vs. Low Agency	*	**	+	+
Observations	241	191	253	200
R-squared	0.106	0.117	0.074	0.066
Performance Included		x		x

Standard errors in parentheses. All models also included student, school, and principal attributes. The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. See Table B1 in the appendix for descriptive statistics and survey question wording for these measures.
+ p<0.1, * p<0.05, ** p<0.01

Table 7. Selected Estimated Coefficients from Regressions of Principal Views of Their Role in Implementing the Teacher Evaluation System on Agency over Pre-Tenure Teachers

	(1)	(2)	(3)	(4)
	I find it challenging to talk with the teacher about content-specific issues when the teacher is teaching a subject I did not teach.		**I find it challenging to identify concrete steps to help the teacher improve his/her practice.**	
Low Agency	0.858*	0.873+	1.184**	1.376**
	(0.428)	(0.481)	(0.452)	(0.514)
High Agency	-0.578	-0.550	-0.135	-0.177
	(0.421)	(0.488)	(0.456)	(0.538)
F-test: High v. Low Agency	*	*	*	*
Observations	253	200	253	200
Pseudo R-squared	0.083	0.098	0.063	0.092
	I find it challenging to give the teacher negative feedback about the teacher's teaching.		**I worry that providing negative feedback will lead the teacher to undermine my relationship with other teachers.**	
Low Agency	1.267**	1.178*	1.369***	1.542***
	(0.413)	(0.463)	(0.400)	(0.449)
High Agency	-0.360	-0.509	-0.305	-0.209
	(0.460)	(0.567)	(0.415)	(0.492)
F-test: High v. Low Agency	**	*	**	**
Observations	252	199	252	199
Pseudo R-squared	0.071	0.084	0.081	0.103
Performance Included		x		x

Standard errors in parentheses. All models also included student, school, and principal attributes. The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. See Table B4 in the appendix for descriptive statistics and survey question wording for these measures.
+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001

Table 8. Average School-Aggregate Teacher Ratings of Principal Leadership Effectiveness by Principal Agency

	Dimension: Experience		**Dimension: Performance**	
	Pre-Tenure	Post-Tenure	Below Expectations	Meet/Exceed Expectations
Low Agency	3.043 (0.511)	3.092 (0.413)	3.103 (0.420)	3.053 (0.449)
Medium Agency	3.155 (0.391)	3.162 (0.397)	3.155 (0.403)	3.156 (0.390)
High Agency	3.201 (0.407)	3.285 (0.476)	3.330 (0.376)	3.204 (0.442)
T-test: High v. Low Agency		+	*	
Observations	256	256	257	256

Standard errors in parentheses. Teachers responded on a four-point scale (strongly disagree to strongly agree) to the following 14 statements: I feel respected by the principal at this school; The principal at this school is an effective manager who makes the school run smoothly; The principal has confidence in the expertise of the teachers at this school; I trust the principal/school leader at his/her word (to do what he/she says that he or she will do); At this school, it's ok to discuss feelings, worries, and frustration with the principal; The principal takes a personal interest in the professional development of teachers; The principal looks out for the personal welfare of the staff members; The principal places the needs of children ahead of personal interests; The principal and assistant principal function as a cohesive unit; The principal/school leader at this school makes clear to the staff his/her expectations for meeting instructional goals; The principal/school leader at this school communicates a clear vision for this school; The principal/school leader at this school understands how children learn; The principal/school leader at this school sets high standards for student learning; The principal/school leader at this school sets clear expectations for teachers about implementing what they have learned in professional development; The principal/school leader at this school carefully tracks student academic progress; The principal/school leader at this school knows what's going on in my classroom; and, The principal/school leader at this school participates in instructional planning with teams of teachers.

APPENDIX A: PRINCIPAL SURVEY

Principal Strategies for Improving Teacher Effectiveness: 2015-16

SCHOOL'S TEACHING STAFF: *The following questions ask about your school's teaching staff.*

1. Is *hiring* effective/highly effective teachers a challenge for your school? *Mark one.*

- ○ Generally, yes. → Skip to question 2.
- ○ Yes, but only for certain positions. → Continue to question 1a.
- ○ No, we have no problem hiring effective/highly effective teachers. → Skip to question 2.

1a. If you answered "Yes, but only for certain positions" for question 1, please specify for which positions it is challenging.

Mark one bubble on each line.	Yes	No
English/Language Arts	○	○
History/social studies	○	○
Mathematics	○	○
Science	○	○
Special education	○	○
ELL/ESL specialists	○	○
Foreign language teachers	○	○
Career and technical education	○	○
Physical education	○	○
Art/Music/Theatre	○	○
Other *(please specify)*:	○	○

2. What percent of the teachers in your school this year met or exceeded your performance expectations for effective teaching?
Fill in a percent between 0 and 100: _____ %

3. To what extent are you able to help the following teachers increase their effectiveness?

Mark one bubble on each line.	Not at all	Some	A good amount	A lot	N/A
A **pre-tenure teacher** whose performance…					
… is below your expectations	○	○	○	○	○
… meets or exceeds your expectations	○	○	○	○	○
A **tenured teacher** whose performance…					
… is below your expectations	○	○	○	○	○
… meets or exceeds your expectations	○	○	○	○	○

4. Across your years of experience at this school (or at your last school if this is your first year at your current school), please let us know to what extent are you able to influence the following teachers' decisions regarding whether to leave or remain at your school?

Mark one bubble on each line.	Not at all	Some	A good amount	A lot	N/A
A decision to **leave your school** made by a…					
… **pre-tenure teacher** whose performance is below your expectations	○	○	○	○	○
… **tenured teacher** whose performance is below your expectations	○	○	○	○	○
A decision to **remain at your school** made by a…					
… **pre-tenure teacher** whose performance meets or exceeds your expectations	○	○	○	○	○
… **tenured teacher** whose performance meets or exceeds your expectations	○	○	○	○	○

ADVANCE: *The following questions ask about your experiences working with* Advance *to assess teacher effectiveness during the current school year.*

5. In *a typical week* in winter during this school year, how many hours were spent observing teachers in their classrooms in your school as part of *Advance* and for any other purpose by the following individuals?

Enter a number between 0 and 40 on each of the following cells.	As part of *Advance*	For any other purpose
Hours **you** spent …		
… observing teachers		
… giving teachers feedback		
Hours the **assistant principals** spent …		
… observing teachers		
… giving teachers feedback		
Hours the **superintendent or superintendent's designee** spent …		
… observing teachers		

6. For how many teachers in your school has *Advance's* Measures of Teaching Practice and Measures of Student Learning helped teachers improve their performance?

Mark one bubble on each line.	None	Some	About half	A lot
Teachers whose performance is **below my expectations…**				
…the Measures of Teaching Practice help them improve	○	○	○	○
…the Measures of Student Learning help them improve	○	○	○	○

Teachers whose performance **meets or exceeds my expectations…**				
...*the Measures of Teaching Practice* help them improve	○	○	○	○
...*the Measures of Student Learning* help them improve	○	○	○	○

7. For how many teachers at your school are the following statements true?

Mark one bubble on each line.	None	Some	About half	A lot
I find it challenging to talk with the teacher about content-specific issues when the teacher is teaching a subject I did not teach.	○	○	○	○
I find it challenging to identify concrete steps to help the teacher improve his/her practice.	○	○	○	○
I find it challenging to give the teacher negative feedback about the teacher's teaching.	○	○	○	○
I worry that providing negative feedback will lead the teacher to undermine my relationship with other teachers.	○	○	○	○

8. During the current school year, how often did you talk with teachers (for at least 5 minutes) about their instructional practice for *Advance*? Please respond for a typical teacher in each of the following groups.

Mark one bubble on each line.	No such teachers at this school	Never	A few times a year	Once a month	More than once a month
Pre-tenure teachers who you generally consider to be…					
...ineffective or developing	○	○	○	○	○
...effective or highly effective	○	○	○	○	○
Tenured teachers who you generally consider to be…					
...ineffective or developing	○	○	○	○	○
...effective or highly effective	○	○	○	○	○

TEACHER OBSERVATIONS AND FEEDBACK: *The following questions ask about your observations of teachers and the feedback you provided them during this and last school year (2015-16 and 2014-15). As a reminder, your responses to all questions are completely confidential. All responses will be aggregated across survey participants.*

9. During the 2014-15 or 2015-16 school years, did you conduct classroom observations of a teacher who was up for his/her initial tenure decision?

Mark one bubble on each line.	Yes	No
Observed a teacher in 2015-16 who is up an initial tenure decision in 2015-16	○	○
Observed a teacher in 2014-15 who was up for initial tenure decision in 2014-15	○	○

If you answered "No" to both parts of question 9 please skip to question 12.

Important Directions: *If you conducted classroom observations of more than one teacher up for an initial tenure decision, please consider the teacher for whom you most recently made a tenure recommendation when you answer the following questions.*

10. Recall this teacher's classroom observations during the year of the initial tenure decision. Was this teacher observed more often than is required by *Advance* that year? *Mark one.*

○ Yes → Continue to question 10a.

○ No → Skip to question 11.

10a. How many additional observations did this teacher receive during the initial tenure decision year? *Mark one.*

○ 1

○ 2

○ 3 or more

11. Imagine you are having a conversation with this teacher at the end of his/her initial tenure decision year about how to improve his/her performance. Please rank the *three* performance dimensions on which you felt this teacher should prioritize directing his/her efforts (1 = top priority, 2 = second priority, 3 = third priority).

_____ Knowledge of instructional content
_____ Lesson planning
_____ Engaging students in critical thinking
_____ Assessing student learning
_____ Managing students' behavior
_____ Establishing a warm and supportive classroom environment
_____ Collaborating with colleagues and school leaders
_____ Communicating with parents and community members
_____ Commitment to ongoing professional development and learning
_____ Other aspects of the teacher's performance *(please specify)*: _____

12. During the 2014-15 and 2015-16 school years, did you conduct classroom observations of any teacher who was up for tenure after his/her probationary period had been extended the previous year?

Mark one bubble on each line.	Yes	No
Observed a teacher in 2015-16 who was extended in 2014-15	○	○
Observed a teacher in 2014-15 who was extended in 2013-14	○	○

If you answered "No" to both parts of question 12 please skip to question 15.

Important Directions: *If you conducted classroom observations of more than one teacher whom were up for tenure in the year after their probationary period had been extended, please consider the teacher for whom you most recently made a tenure recommendation when you answer the following questions.*

13. Recall this teacher's classroom observations during their extension year. Was this previously extended teacher observed more often than is required by *Advance* that year? *Mark one.*

○ Yes → Continue to question 13a.

○ No → Skip to question 14.

13a. How many additional observations did this teacher receive during the extension year? *Mark one.*

○ 1

○ 2

○ 3 or more

14. Imagine you are having a conversation with this teacher at the end of his/her extension year about how to improve his/her performance. Please rank the *three* performance dimensions on which you felt this teacher should prioritize directing his/her efforts (1 = top priority, 2 = second priority, 3 = third priority).

_____ Knowledge of instructional content
_____ Lesson planning
_____ Engaging students in critical thinking
_____ Assessing student learning
_____ Managing students' behavior
_____ Establishing a warm and supportive classroom environment
_____ Collaborating with colleagues and school leaders
_____ Communicating with parents and community members
_____ Commitment to ongoing professional development and learning
_____ Other aspects of the teacher's performance *(please specify)*: _____

TENURE REVIEW PROCESS: *The following questions ask about the tenure review process at your school.*

15. Since the 2009-10 school year, have you, while a principal in New York City, ever made a recommendation to a superintendent regarding whether a teacher should be approved for tenure? *Mark one.*

○ Yes → Continue to question 16.

○ No → Skip to question 23.

16. To what extent do you agree with the following statements about the current tenure review process?

Mark one bubble on each line.	Not at all	A little	Some	A lot
Too *many* teachers are **granted** tenure.	○	○	○	○
At the time I make recommendations regarding tenure, I have sufficient information to make my decision.	○	○	○	○
I would have been able to make my recommendations regarding tenure with a year less information.	○	○	○	○
I would be better able to make my recommendations regarding tenure with an additional year of information.	○	○	○	○

Too *many* teachers' probationary periods are extended.	○	○	○	○
Too *few* teachers' probationary periods are extended.	○	○	○	○
Too *many* teachers are **denied** tenure.	○	○	○	○
Too *few* teachers are **granted** tenure.	○	○	○	○

17. Consider all the teachers who you reviewed for tenure over the three years between 2013-14 and 2015-16. For how many of those teachers do the following statements reflect your experience with the tenure review process?

Mark one bubble on each line.	None	Some	Most	All
I have control over the tenure decision process.	○	○	○	○
District and central office personnel helped me make recommendations that I think are best but would have been difficult to make without their support.	○	○	○	○
I had the information I needed to make tenure decisions.	○	○	○	○
The current probationary period allowed for an accurate assessment of teachers.	○	○	○	○
I extended teachers because the probationary period was insufficient to accurately assess teachers.	○	○	○	○
Teachers in my school reacted negatively when a teacher **had his/her probationary period extended** a year instead of being granted tenure.	○	○	○	○
Teachers in my school reacted negatively when a teacher **was denied tenure**.	○	○	○	○

18. Please reflect on the *most recent* recommendation you submitted to your superintendent. What was the superintendent's final decision regarding tenure for this teacher? *Mark one.*

○ Approved for tenure

○ Extended probationary period

○ Denied for tenure

Important Directions: *Please consider this teacher as you answer the following question.*

19. For this most recent tenure decision, what were the *three* most important factors in determining your recommendation regarding whether to grant this teacher tenure (1 = most important, 2 = second most important, 3 = third most important)?

_____ Feedback from parents
_____ Feedback from assistant principals
_____ Feedback from instructional leads, coaches, or department chairs
_____ Feedback from mentors, if applicable
_____ Feedback from other teachers besides instructional leads, coaches, department chairs, or mentors
_____ Feedback from students
_____ Measures of student achievement from standardized test(s) (if available)
_____ Measures of student achievement from teacher-provided artifacts
_____ Prior performance ratings

_____ Fulfillment of professional responsibilities
_____ Formal full-period classroom observations conducted as part of *Advance*
_____ Informal 15-minute minimum classroom observations conducted as part of *Advance*
_____ Brief classroom walkthroughs *not* conducted as part of *Advance*
_____ Other *(please specify)*: _____
_____ Other *(please specify)*: _____
_____ Other *(please specify)*: _____

20. Now consider the teachers you reviewed for tenure in 2013-14 and 2014-15. Did the superintendent decide to extend the probationary period for any of these teachers' tenure?

Mark one bubble on each line.	Yes	No
2013-14	○	○
2014-15	○	○

If the superintendent did not extend the probationary period for any teacher you reviewed for tenure in 2013-14 and 2014-15, please skip to question 23.

20a. Did any of these teachers who were extended in either 2013-14 or 2014-15 continue to teach in your school the following year? *Mark one.*

○ Yes → Continue to question 21.

○ No → Skip to question 22.

Important Directions: *Please consider the teacher whose probationary period was most recently extended when you answer the following questions.*

21. Did you or the teacher take any of the following actions after the teacher was informed that his/her probationary period was extended?

Mark one bubble on each line.	Yes	No	Don't know
I counseled the teacher to leave this school.	○	○	○
I provided the teacher with additional supports (e.g., mentoring, coaching).	○	○	○
I treated the teacher similarly to other teachers who also had their probationary periods extended but who I believed would eventually be granted tenure.	○	○	○
The teacher did not teach in any NYCDOE school during the year after having his/her probationary period extended.	○	○	○
The teacher transferred to another school in the NYCDOE for the year after having his/her probationary period extended.	○	○	○

22. Which of the following occurred during the year after the probationary period was extended (i.e., the extension year)?

Mark one bubble on each line.	Yes	No	Don't know
The teacher became more effective at supporting students' learning during the extension year.	○	○	○
The teacher switched to a different grade or subject during the extension year.	○	○	○
The teacher received tenure at the end of the extension year.	○	○	○
The teacher's probationary period was extended at the end of the extension year.	○	○	○
The teacher was denied tenure at the end of the extension year.	○	○	○

23. How many teachers have you counseled out of your school in the last three years?

0	1	2	3	4	5 or more
○	○	○	○	○	○

NEW TEACHER MENTORING: *The following questions ask about the state-mandated new teacher mentoring at your school.*

24. To what extent do the following people participate in the matching of mentors to mentees?

Mark one bubble on each line.	None	A little	Some	A lot
All teachers	○	○	○	○
A group of teachers	○	○	○	○
Principal	○	○	○	○
Other school leaders (e.g. department chairs, assistant principals)	○	○	○	○

25. Consider the mentor-mentee pairings in recent years at your school. How many of these pairings reflect the following statements?

Mark one bubble on each line.	None	Some	Most	All	Don't know
I had systems in place to learn about how mentoring was progressing.	○	○	○	○	○
The mentor and mentee met about every week.	○	○	○	○	○
I met with the mentor and mentee pair two or more times during the academic year.	○	○	○	○	○
The mentor provided me with helpful information about the mentee.	○	○	○	○	○
The mentors and mentees met before the first week of school.	○	○	○	○	○
The mentors and mentees met during the first month of school.	○	○	○	○	○
The mentors and mentees met before the December break.	○	○	○	○	○

The mentor benefited from the mentoring relationship.	○	○	○	○	○
The mentee benefited from the mentoring relationship.	○	○	○	○	○
I provided mentors with specific strategies for working with new teachers.	○	○	○	○	○
I used the mentoring program to identify/develop instructional leaders.	○	○	○	○	○
The mentor-mentee relationship continued past the mentee's first year of teaching.	○	○	○	○	○

PROFESSIONAL LEARNING TIME: *The following questions ask about how teachers experienced the weekly professional learning time at your school during the current school year.*

26. To what extent did the following people determine how teachers spent their professional learning time?

Mark one bubble on each line.	None	A little	Some	A lot
All teachers	○	○	○	○
A group of teachers	○	○	○	○
Principal	○	○	○	○
Other school leaders (e.g. department chairs, assistant principals)	○	○	○	○

27. Please rank the *three* most important sources of information that were used to determine how teachers at your school use the weekly professional learning time (1 = most important, 2 = second most important, 3 = third most important).

_____ Student assessment results from *Advance* (i.e. Measure of Student Learning)
_____ Formative assessment results not from *Advance*
_____ *Advance* classroom observations (i.e. Measures of Teaching Practice)
_____ Classroom observations not from *Advance*
_____ Teacher or student portfolios
_____ Parent surveys
_____ Student surveys/self-reporting
_____ Teacher discussions/focus group
_____ Analysis of school-wide classroom data
_____ Teacher surveys
_____ Other *(please specify)*: _____
_____ Other *(please specify)*: _____
_____ Other *(please specify)*: _____

28. Consider the ways in which teachers at your school spent the weekly professional learning time over the current school year. How frequently did the professional learning time reflect the following statements?

Mark one bubble on each line.	Never	Sometimes	Often	Always
I participated in weekly professional learning time activities.	○	○	○	○
The professional learning time was a single 80-minute block of time.	○	○	○	○

The professional learning time happened at the end of the school day.	○	○	○	○
The structure and content of the professional learning time varied based on individual teacher needs.	○	○	○	○
Information from *Advance* was used to design professional learning time activities.	○	○	○	○
Teachers who had their probationary period extended spent the professional learning time differently than teachers who received tenure.	○	○	○	○
Professional learning time was structured by content-based teams.	○	○	○	○
Professional learning time was structured by grade-level teams.	○	○	○	○

29. What *three* things have improved *most* in your school as a result of professional learning time (1= most improved, 2 = second most improved, 3 = third most improved)?

_____ Knowledge of instructional content
_____ Lesson planning
_____ Engaging students in critical thinking
_____ Assessing student learning
_____ Managing students' behavior
_____ Establishing a warm and supportive classroom environment
_____ Collaborating with colleagues and school leaders
_____ Communicating with parents and community members
_____ Commitment to ongoing professional development and learning
_____ Collegiality and collaboration among teachers
_____ Teacher morale
_____ Coherence in curriculum across grade levels
_____ Curricular integration across subject areas
_____ Other *(please specify)*: _____
_____ Other *(please specify)*: _____
_____ Other *(please specify)*: _____

FINAL THOUGHTS: *The following questions are some final questions asking about your approach to improving teacher effectiveness in your school.*

Do you have any other thoughts you would like to share with us regarding efforts you have undertaken to strengthen teaching at your school?

What are some strategies you use to encourage effective/highly effective teachers to stay at your school?

What are some strategies you use to encourage ineffective/developing teachers who have not responded to coaching or other supports to leave your school?

Do you have any other thoughts you would like to share with us regarding the Department of Education's involvement in your efforts to strengthen teaching at your school?

Thank you for taking this survey! We appreciate your time.

Appendix B: Supplemental Tables

Table B1. Descriptive Statistics of Measures of Strategic Action

	N	Mean	SD
Teacher Tenure Review			
% of tenure decisions extending the probationary period	211	34.6	24.5
Number of additional observations of teachers up for initial tenure decision	235	1.3	1.2
No additional observations (0)	87	37.0	
1 additional observation (1)	36	15.3	
2 additional observation (2)	58	24.7	
3 additional observation (3)	54	23.0	
Number of additional observations of teachers whose probationary period was extended the prior year	179	1.4	1.2
No additional observations (0)	59	33.0	
1 additional observation (1)	29	16.2	
2 additional observation (2)	52	29.1	
3 additional observation (3)	39	21.8	
Teachers for whom principal extended the probationary period because the probationary periods was insufficient to accurately assess teachers	241	1.0	1.0
None (0)	91	37.8	
Some (1)	93	38.6	
Most (2)	17	11.2	
All (3)	30	12.5	
Whether principal provided additional supports to extended teachers and/or counseled them out	119	1.0	0.5
Did neither (0)	18	15.1	
Provided additional supports or counseled them out (1)	87	73.1	
Provided additional supports and counseled them out (2)	14	11.8	
Number of teachers principal counseled out over the last three years	254	1.6	1.1
0 teachers (0)	47	18.5	
1 or 2 teachers (1)	79	31.1	
3 or 4 years (2)	55	21.7	
5 or more teachers (3)	73	28.7	
Teacher Evaluation			
Hours spent during a typical winter week observing teachers	253	11.1	11.0
Hours spent during a typical winter week providing feedback to teachers	253	10.3	11.5
Frequency of conservations with pre-tenure teachers about their instructional practices	251	2.2	0.8
Never or A few times a year (1)	64	25.5	
Once a month (2)	80	31.9	
More than once a month (3)	107	42.6	
Frequency of conservations with post-tenure teachers about their instructional practices	256	2.1	0.8
Never or A few times a year (1)	73	28.5	
Once a month (2)	91	35.6	

	N	Mean	SD
More than once a month (3)	92	35.9	
Frequency of conservations with teachers performing below expectations about their instructional practices	243	2.3	0.8
Never or A few times a year (1)	49	20.2	
Once a month (2)	65	26.8	
More than once a month (3)	129	53.1	
Frequency of conservations with teachers meeting or exceeding expectations about their instructional practices	256	2.0	0.9
Never or A few times a year (1)	89	34.8	
Once a month (2)	71	27.7	
More than once a month (3)	96	37.5	

Table B2. Distributions of Principal Agency Measures

	Low Agency		Medium Agency		High Agency		Total
	N	*%*	*N*	*%*	*N*	*%*	*N*
Dimension: Teacher Experience							
Pre-Tenure	26	10.2	192	75.0	38	14.8	256
Post-Tenure	68	26.7	172	67.2	16	6.3	256
Dimension: Teacher Performance							
Below Expectations	68	26.5	172	66.9	17	6.6	257
Meet/Exceed Expectations	32	12.5	175	68.4	49	19.1	256

Table B3. Joint Distribution of Principal Agency Measures by Dimension

			Dimension: Experience Post-Tenure					Dimension: Performance Meet/Exceed Expectations			
			Low	Medium	High	Total		Low	Medium	High	Total
Low	N	Pre-Tenure Teachers	22	4	0	26	Teachers Below Expectations	24	43	1	68
	Row %		84.6	15.4	0.0	100		35.3	63.2	1.5	100
	Col %		32.4	2.3	0.0	10.2		92.3	22.4	2.6	26.6
Medium	N		43	144	4	191		2	147	23	172
	Row %		22.5	75.4	2.1	100		1.2	85.5	13.4	100
	Col %		63.2	83.7	26.7	74.9		7.7	76.6	60.5	67.2
High	N		3	24	11	38		0	2	14	16
	Row %		7.9	63.2	28.9	100		0.0	12.5	87.5	100
	Col %		4.4	14.0	73.3	14.9		0.0	1.0	36.8	6.2
Total	N		68	172	15	255		26	192	38	256
	Row %		26.7	67.4	5.9	100		10.2	75.0	14.8	100
	Col %		100	100	100	100		100	100	100	100

Table B4. Descriptive Statistics of Principals' Views of their Role in Implementing the Tenure Review Process and Teacher Evaluation System

	N	Mean	S.D
Tenure Review Process			
Consider all the teachers who you reviewed for tenure over the three years between 2013-14 and 2015-16. For how many of those teachers do the following statements reflect your experience with the tenure review process?			
I have control over the tenure decision process.	243	1.9	0.9
None	12	4.9	
Some	68	28.0	
Most	99	40.7	
All	64	26.3	
I had the information I needed to make tenure decisions	242	2.3	0.8
None	5	2.1	
Some	34	14.1	
Most	87	36.0	
All	116	47.9	
The current probationary period allowed for an accurate assessment of teachers	241	1.9	0.9
None	18	7.5	
Some	66	27.4	
Most	77	32.0	
All	80	33.2	
Teacher Evaluation System			
For how many teachers at your school are the following statements true?			
I find it challenging to talk with the teacher about content-specific issues when the teacher is teaching a subject I did not teach.	256	0.5	0.7
None	156	60.9	
Some	84	32.8	
About half	11	4.3	
A lot	5	2.0	
I find it challenging to identify concrete steps to help the teacher improve his/her practice.	256	0.3	0.6
None	190	74.2	
Some	56	21.9	
About half	7	2.7	
A lot	3	1.2	
I find it challenging to give the teacher negative feedback about the teacher's teaching.	255	0.4	0.7
None	174	68.2	
Some	65	25.5	
About half	11	4.3	
A lot	5	2.0	

I worry that providing negative feedback will lead the teacher to undermine my relationship with other teachers.	255	0.5	0.8
None	158	62.0	
Some	73	28.6	
About half	11	4.3	
A lot	80	33.2	

Table B5. Selected Estimated Coefficients from Regression Models of Strategic Actions for Teacher Tenure Review on Principal Agency over Pre-Tenure Teachers

	Extend Probationary Period Because Could Not Accurately Assess Teachers		**# of Add'l Observations of Teachers up for Initial Tenure Decision**		**# of Add'l Observations of Teachers Extended the Prior Year**	
	(1)	(2)	(3)	(4)	(5)	(6)
Low Agency	-0.027	-0.104	0.605	0.298	0.120	-0.079
	(0.425)	(0.460)	(0.485)	(0.559)	(0.522)	(0.602)
High Agency	-0.671^{+}	-0.765^{+}	0.185	0.293	0.056	0.344
	(0.358)	(0.427)	(0.351)	(0.420)	(0.426)	(0.533)
F-test: High v. Low						
Observations	238	189	232	182	177	139
Pseudo R-squared	0.039	0.052	0.031	0.044	0.036	0.049
Performance Included		x		x		x

Standard errors in parentheses. All models also included student, school, and principal attributes. The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. See Table B1 in the appendix for descriptive statistics and survey question wording for these measures.
+ $p<0.1$

Table B6. Selected Estimated Coefficients from Regression Models of Time Principals and Assistant Principals Spent Observing Teachers and Providing Teachers Feedback

	Principal		**Assistant Principal**		**Total**	
	(1)	(2)	(3)	(4)	(5)	(6)
			Hours Spent Observing Teachers			
Low Agency: Pre-Tenure	3.189	3.333	4.873^{+}	5.559^{+}	8.058^{+}	8.905^{+}
	(2.225)	(2.539)	(2.521)	(2.860)	(4.460)	(5.039)
High Agency: Pre-Tenure	-1.231	-3.668	1.004	-1.083	-0.253	-4.769
	(1.945)	(2.366)	(2.203)	(2.666)	(3.899)	(4.696)
F-test: High vs. Low	*	**	*	*		*
Observations	250	199	248	198	248	198
R-squared	0.182	0.207	0.179	0.191	0.175	0.191
			Hours Spent Providing Teachers Feedback			
Low Agency: Pre-Tenure	3.157	3.483	5.793*	6.550*	8.932^{+}	9.991^{+}
	(2.336)	(2.669)	(2.533)	(2.866)	(4.610)	(5.214)
High Agency: Pre-Tenure	-1.877	-4.340^{+}	0.170	-1.972	-1.694	-6.311
	(2.042)	(2.487)	(2.216)	(2.671)	(4.031)	(4.860)
F-test: High vs. Low	+	*	+	*	+	*
Observations	250	199	247	197	247	197
R-squared	0.182	0.211	0.173	0.193	0.176	0.201
Low Agency: Post-Tenure	0.195	0.924	-0.191	0.152	-0.012	1.056
	(1.604)	(1.855)	(1.756)	(2.019)	(3.185)	(3.658)
High Agency: Post-Tenure	-3.358	-5.960^{+}	-0.444	-2.097	-3.602	-8.001
	(2.915)	(3.409)	(3.281)	(3.844)	(5.950)	(6.967)
F-test: High vs. Low		+				
Observations	250	200	247	198	247	198
R-squared	0.176	0.203	0.155	0.166	0.163	0.180
Low Agency: Below Expectations	-0.674	-0.015	-0.382	0.272	-1.122	0.186
	(1.617)	(1.861)	(1.771)	(2.017)	(3.210)	(3.656)
High Agency: Below Expectations	-3.940	-6.311^{+}	-3.030	-4.886	-7.016	-11.270+
	(2.931)	(3.421)	(3.200)	(3.700)	(5.802)	(6.708)
F-test: High vs. Low		+				+
Observations	251	200	248	198	248	198
R-squared	0.178	0.202	0.158	0.174	0.167	0.187
Performance Included		x		x		x

Standard errors in parentheses. All models also included student, school, and principal attributes. The performance covariates are measured in the year prior to the principal's arrival at the school and are the percent of students proficient in neither math nor ELA and the percent of teachers with value-added below the 25th percentile in math and ELA. See Table B1 in the appendix for descriptive statistics and survey question wording for these measures.
+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001