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Working Paper:

You Can Only Lead if Someone Follows: The Role of Teachers' Assessment of Principal Quality in Principal Turnover

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Principals can have potentially large effects on their schools, and especially student outcomes. When they leave their roles, they cause disruptive effects to the school climate. If effective principals are more likely to leave than ineffective principals, the negative effects of principal turnover are likely exacerbated. Relatively little, however, is known about the quality of principals who leave the principalship. We use teachers' perceptions of their principals as a measure of principal quality to understand the relationship between principal quality and turnover. Using local- as well as national-level data, we find that higher quality principals, as rated by their teachers, are less likely to leave the principalship. This finding persists across a host of contexts and time, indicating that inasmuch as principal turnover is a concern, it is not driven by higher quality principals. The paper concludes with some implications of these findings and recommendations for further research.

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Introduction

Principals are important drivers of school improvement (Clifford & Ross, 2012; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Sebastian & Allensworth, 2012). Their behaviors and leadership practices are strongly correlated with student achievement (Waters, Marzano, & McNulty, 2003). Yet, the same research also suggests that principals vary meaningfully in their effectiveness. Some have significant positive effects on students while others have significant negative effects. To date, research has failed to successfully identify observable characteristics that predict *ex ante* whether or not a principal will be effective. Researchers instead can only determine retrospectively and observe after the fact whether the principal had a positive impact.

What is true for researchers might also be true for principals themselves; they might have difficulty predicting their effectiveness beforehand and it might only be revealed after some time on the job. National data suggest that approximately 20 percent of public school principals in the United States leave their positions each year (Miller, 2013), which is of concern to policy makers. But, the interplay between principal quality and principal turnover is critical to our understanding of the causes and effects of principal turnover. If the most effective principals are the ones leaving schools, it suggests that, on average, students would be better off with less principal turnover, and that states and districts should seek broad solutions to increase principal retention. On the other hand, if the principals leaving schools are relatively less effective than those who remain, it could suggest that less-effective principals currently sort themselves out of schools in a way that is not as negative for students as it might first appear. If this is the case, broad efforts to increase principal retention would have unintended negative consequences for the students in schools with lower-quality principals who now stay rather than exit. Any

individual principal's decision to leave a school is obviously a function of many internal and external factors that are difficult to predict. Nonetheless, gaining a better understanding of general patterns of principal turnover could help policy makers understand the extent to which policy solutions should seek to stem principal departures.

The purpose of this paper is to estimate the relationship between principal effectiveness (which we capture with a principal quality measure) and turnover. Specifically, we assess whether higher quality principals are more or less likely to leave their schools in New York City (NYC) as well as at the national level. Results show that lower quality principals are more likely to leave their schools than higher quality principals. This finding persists across school contexts and time, lending robustness to our results. We discuss how these results contribute to the literature around differential principal turnover and how future work can further inform our understanding of principal mobility.

Background and Motivation

Prior research has established that principals matter for student achievement. School leadership is considered the second most significant school-related factor impacting student outcomes, after teaching (Leithwood et al., 2004). While principals do not directly affect student achievement by instructing students as do teachers, they have a strong influence on student outcomes through teacher hiring, development, and retention, and influencing teachers' job satisfaction and their perceptions of school culture (Glanz, Shulman, & Sullivan, 2007; Grissom & Loeb, 2011; Harris, Rutledge, Ingle, & Thompson, 2010; Leithwood et al., 2004; Loeb, Kalogrides, & Béteille, 2012). For instance, Grissom (2011) finds that principal effectiveness is associated with greater teacher satisfaction and lower teacher attrition, with larger positive impacts in disadvantaged schools. Similarly, when examining avenues through which principals

can build teacher capacity, Doll (2010) argues that principals can help foster strong relationships between teachers, celebrate teachers' successes, and help teachers problem solve. Effective leaders are also individuals who strengthen support systems for teachers and allocate resources effectively, "to make teachers' work less burdensome and more appealing" (Loeb & Reininger, 2004, p. 55).

Given the beneficial impact principals can have, it is not surprising that turnover among principals has negative consequences for teacher retention, student achievement gains, and school culture (Béteille, Kalogrides, & Loeb, 2012; Griffith, 2004; Mascall & Leithwood, 2010). Exploring school outcomes around a principal transition, Miller (2013) finds that the years before and after a principal's departure from a school are marked by increased teacher attrition and decreased student achievement. Most principals serve less than five years at a given school (Miller, 2013) which likely limits that principal's potential effects on school outcomes via its teachers. Branch and colleagues (2008) hypothesize that principals' influence over the composition of the school staff increases with their tenure at the school as it enriches their knowledge of the school, its students, teachers, and community. The consequences of principal turnover are therefore not necessarily felt equally.

Principals are more likely to leave disadvantaged schools than they are more advantaged schools (Loeb, Kalogrides, & Horng, 2010). Unfavorable working conditions in these schools may be a contributing factor (Yan, 2019). And, when principals move between schools, they are more likely to transfer from schools that have greater proportions of minority, low-income, and low-achieving students to schools that are relatively more "advantaged" (Béteille et al., 2012; Branch, Hanushek, & Rivkin, 2008; DeAngelis & White, 2011; Fuller & Young, 2009; Gates et al., 2006; Loeb et al., 2010). Such patterns of turnover are especially problematic if the negative

effects of principal turnover disproportionately harm high poverty, low-achieving schools (Béteille et al., 2012). These studies, however, leave unanswered the question of whether all principal turnover is a net negative for schools and students. Depending on the quality of the principal, it is possible that these schools would have seen even worse outcomes had the principal not departed.

While the importance of principals and the on average negative outcomes correlated with principal turnover are well-established, little work examines whether higher quality principals are more likely to leave schools. One reason for the lack of research on the topic is that measuring principal effectiveness is challenging (Clifford & Ross, 2012; Goldring et al., 2009). Race to the Top eligibility requirements included the design and implementation of rigorous evaluation systems for teachers and principals as a criterion to submit grant applications (U.S. Dept. of Ed., 2009). Approximately 40 states, as a result, tried to do as much (Chiang, Lipscomb, & Gill, 2016). Of the states and districts that did implement principal evaluation systems, many of them continue to struggle to effectively use these tools to assess principals – a problem that is exacerbated by the "scant evidence on the validity and reliability of current principal evaluation tools" (McCullough, Lipscomb, Chiang, Gill, & Cheban, 2016, p. 3). This is partly the case because principals' responsibilities span multiple areas, including administration, organization management, day-to-day instruction, instructional program, internal relations, and external relations (Horng, Klasik, & Loeb, 2010) as well as managing physical facilities and student behavior (Goldring et al., 2009). Accurately evaluating school leaders on all these dimensions proves incredibly hard.

The studies that do attempt to measure principal effectiveness face certain challenges. Grissom, Kalogrides, and Loeb (2015) and Chiang et al. (2016) discuss the difficulties of

disentangling principals' contribution to student outcomes from other factors over which principals may not have control, such as teachers hired by prior principals. Additionally, estimating principal value-added to student achievement imposes substantial data requirements; namely, school observations over many years with the frequent turning over of the principal (Fuller & Hollingworth, 2014).

Acknowledging these challenges, we leverage teacher perceptions of their principals as an alternative. This method to evaluate school leaders has face validity because principals primarily affect student outcomes through teachers (Hallinger & Heck, 1998; Hitt & Tucker, 2016). Teachers who are dissatisfied with their principals are more likely to leave schools (Allensworth, Ponisciak, & Mazzeo, 2009; Boyd et al. 2011; Branch, Hanushek, & Rivkin, 2012; Grissom, 2011; Waddell, 2010), negatively affecting students (Ronfeldt, Loeb, & Wyckoff, 2013). This is not a novel concept. Other researchers have examined a measure of principal leadership included on many surveys of teachers. For instance, Louis, Dretzke, and Wahlstrom (2010) use teacher ratings of their principal's leadership to estimate the relationship between principal leadership and student achievement. Similarly, Sebastian and Allensworth (2012) use multilevel structural equation modeling to explore how organizational factors mediate the relationship between a principal's instructional leadership (as reported by teachers) and classroom instruction and student achievement. Similar to these studies, we use teacher ratings of their principals as a measure of principal quality and will hereon refer to it as such.

What is relatively novel is our use of this measure of principal quality to examine the connection between principal effectiveness and principal turnover. Grissom and Bartanen (2018) is the only study we are aware of that has also done this. Focusing on Tennessee, they construct measures of principal quality from teachers' survey responses as well as principal evaluation

information collected through the Tennessee Education Acceleration Model (TEAM). They find that, on average, less effective principals, as measured by teacher ratings and TEAM scores, are more likely to leave their schools. While TEAM may be a more valid measure of principal effectiveness, teacher ratings are positively correlated with TEAM scores. Further, teacher ratings are correlated with principal turnover (Grissom & Bartanen, 2018). These findings lend support to the use of teacher ratings as a measure of principal quality. We add to this nascent literature by examining the relationship between principal quality and principal turnover both in another jurisdiction, New York City (NYC), as well as at the national level. Our exploration speaks to the generalizability of findings while adding more nuance to the topic by understanding the relationship of interest across a host of principal characteristics and school contexts.

Present Study

Our analysis answers the following policy-relevant question: are higher quality principals less likely to leave their schools? We begin by addressing this research question in one large urban district in the U.S., New York City. By focusing on one district over multiple consecutive years, we can explore differences by context and time. We then replicate our analysis at the national level using the Schools and Staffing Survey (SASS) data. The national-level data only offers us a cross-sectional view of the data, but does allow us to explore if patterns from our local setting results replicate across the nation. Regardless of the advantages of our two datasets, the national-level analysis may mask heterogeneity in the relationship between principal quality and turnover, and our local-level findings may not be generalizable to other contexts.

In addition to exploring whether Grissom and Bartanen's (2018) findings persist in the contexts we examine, we extend the earlier work in meaningful ways. One contribution is our exploration of whether teacher ratings of their principals just reflect general teacher

dissatisfaction with the school rather than specifically about the principal's leadership. Given the earlier studies showing that principal effectiveness improves with experience in the position (Branch et al., 2008), we also assess whether teacher ratings are differentially associated with principal turnover by the number of years the principal has been at the school. Another important contribution we make is to assess whether the pattern of more effective teachers being more likely to leave high minority and high poverty schools (Author, 2011) is evident in principal turnover, exacerbating any negative effects of principal turnover.

While we, like most other researchers, are unable to distinguish between voluntary and involuntary turnover, teacher ratings of their principal's quality potentially impact both types of principal turnover. Superintendents, who initiate involuntary departures, may, formally or informally, use teacher ratings to identify which principals will not be reappointed. With respect to voluntary departures, principals may take how teachers at the school feel about their leadership quality in determining whether to remain at the school. In both situations, teachers' opinions about their principal's quality matters given that principals' ability to engage their teaching staff in school improvement efforts is significantly limited should the teachers view their principal's leadership unfavorably.

Teacher ratings of principal quality could also have both a direct and indirect effect on principal turnover. In NYC, the teacher surveys containing our measure of principal quality are used to measure and improve school quality ("NYC School Survey," n.d.). Survey results are published on the district's webpage. Superintendents and principals are very likely to review them prior to the start of the following academic year, allowing teacher ratings to directly influence both voluntary and involuntary turnover. NYC teacher ratings may also have an indirect effect should the sentiment captured by the survey drive observable teacher behavior.

For example, teachers who rate their principal poorly are presumably less likely to behave in ways that support their principal's school improvement efforts and are more likely to directly report their displeasure to the principal, superintendent, or other individuals who may share their sentiments with the principal or superintendent. It is through these indirect avenues that teacher ratings on the SASS could influence voluntary and involuntary principal turnover given that the SASS results are unlikely to have been reviewed by either principals or their superintendents.

Similar to other measures of principal quality, teacher survey responses likely suffer from biases. Despite teacher ratings being an imperfect method of evaluating principal quality, they are an important measure in and of themselves. Teacher ratings of principal quality may be qualitatively different from the principal's "true" quality; however, given that principals primarily affect students through teachers (Hallinger & Heck, 1998; Hitt & Tucker, 2016), we argue that teachers' perceptions of their principals are a relevant measure. This is especially true because teachers' perceptions of their principals are inversely related to teachers' likelihood of leaving the school (Grissom, 2011), and teacher turnover negatively affects student outcomes (Ronfeldt et al., 2013). Teacher ratings of their principals are therefore an important measure of principal quality, regardless of whether they reflect "true" principal quality.

By understanding how principal quality relates to principal turnover across a host of school settings, principal characteristics, and timeframes, we aim to provide a more comprehensive look at the issue than has previously been presented.

Data and Measures

Data

New York City. The New York City Department of Education (NYCDOE) annually administers the NYC School Survey between February and April of the academic year to assess

each school's climate ("NYC School Survey," n.d.). We use data from the Teacher Survey component for the 2012-13 to 2015-16 academic years. Across these years, we have a total of about 266,000 teacher responses. We aggregate these responses to the school-year level, resulting in between 1,700-1,900 schools for each year. We augment these survey data with student-, teacher-, school-, and principal-level administrative data provided by the NYCDOE. The administrative data include information on principal age, experience, gender, and race; teacher experience, gender, race, and salary; student race and free and reduced-price lunch eligibility (FRPL); and school level and AYP achievement.

Schools and Staffing Survey. We use the Teacher Surveys from the 2007-08 and 2011-12 waves of SASS, and the corresponding Principal Follow-up Surveys from 2008-09 and 2012-13. The SASS is a nationally representative dataset collected by the NCES. The 2007-08 SASS was administered between September 2007 and June 2008, and the 2011-12 SASS was administered in October 2011 (Cox, Palmer, Spiegelman, Strizek, & Thomas, 2017, p. 37). Across the two waves we have 76,740 teachers across the nation.[1] Similar to the NYC sample, we aggregate teachers' responses to the school-level for each wave and combine these data with the Principal Follow-up Surveys. This leaves us with 7,110 schools with principals who responded to the survey in 2008-09, and 7,080 schools with principals who responded to the survey in 2012-13, for a total of 14,190 school-years. We also have information on student, teacher, and principal demographics for each school including principal age, experience, gender, and race, teacher race, student race, school level, AYP achievement, and rurality indicators.

Sample

Our final sample consists of 5,895 NYC principal-by-school year records and 14,120 SASS principal-by-wave observations. There is minimal missing data in both samples so as not

to trigger bias concerns by dropping cases with missing data. The final NYC sample excludes the roughly 2 percent of total observations which we had to drop because the records identified more than one principal for the school (we cannot disentangle which principal the teachers were evaluating in these cases). We dropped 0.5 percent of the principals in the SASS that lacked information on their following-year employment status.

Unsurprisingly, characteristics of the two samples differ—NYC is not representative of the entire United States (Table 1). For instance, NYC schools serve 87.6 percent minority students on average, compared to the SASS average of 36.6 percent. Similarly, the NYC sample has more minority principals than the SASS sample (51.6 percent compared to 13.3 percent) and more female principals (67.8 percent compared to 41.5 percent). Lastly, NYC public schools are served by 44.9 percent minority teachers compared to the SASS sample which contains 13 percent minority teachers. These differences support our interest in exploring whether the relationship between principal quality and principal turnover differs in the two contexts.

{Insert Table 1 about here}

Measures

We construct a measure of principal turnover for New York City principals and use the measure provided in the SASS dataset. In NYC, we identify principals not observed as a principal in the school the following year as having exited the school. For the SASS sample, NCES follows up with principals in the following year to determine whether they are still the principal in the same school. Those who are not are identified as having exited the school. Principals exit at a considerably higher rate in NYC than in the SASS sample (12.0 versus 20.4 percent) (Table 1).

The NYC School Surveys and the SASS surveys all ask teachers a series of questions about their school's principal which we collapse into measures of principal quality via factor analysis. We assess the factor structure separately by each year (wave) of each survey due to differences in the survey questions (see Tables A1 and A2 in the appendix for the exact wording of the NYC and SASS survey questions, respectively). Survey questions use a four-point Likert scale (1 = strongly disagree to 4 = strongly agree) with the exception of the NYC 2014-15 survey that used a six-point scale which we converted to a four-point scale.

Teachers rate principals highly on both the SASS and the NYC surveys. On the NYC surveys, across all years, 45 percent of responses indicate a "strongly agree" rating and 37 percent of responses indicate an "agree" rating. Across the two SASS waves, 43 percent of responses fall into the "strongly agree" category, and 38 percent of responses fall into the "somewhat agree" category. The relatively high percentages of ratings for both categories and the sharp right skew in overall ratings likely reflects a tendency for socially desirable responses that differ from teachers' "true" answers (Callegaro, 2008). Specifically, teachers may have a general hesitance to be critical of their principals and therefore more likely to select "agree" when they actually disagree with a statement. When they *truly* agree with something, however, they may be more likely to select "strongly agree" instead of "agree" to differentiate their responses from those that they rated affirmative even though they had ambivalent or somewhat negative responses. Another reason we may be seeing the large percentage of positive statements for NYC could be because NYC School Surveys are used for accountability and school improvement purposes.[2] To increase the chance that we capture teachers' *true* agreement with a statement and not the pressure to inflate answers, we convert the NYC and SASS survey scales into a binary indicator (1 = strongly agree; 0 otherwise).[3]

Reliability analysis for questions on the NYC surveys, by year, yield Cronbach's alphas that are greater than 0.97. A similar exercise for questions on the SASS surveys by wave shows Cronbach's alphas that are greater than 0.86. After aggregating each question to the school-by-year (wave) level, we therefore average all principal-related questions to create one measure of teacher perceptions of their principal (i.e. principal quality).

On average, principals receive strikingly similar ratings from their teachers across the two samples. Although the questions vary across the samples and waves (the importance of which we examine later), the average principal has a 45.0 percent "strongly agree" rating in NYC and a 43.9 percent "strongly agree" rating in the SASS. We standardized these measures within year (wave) for our analysis for interpretational ease.

Analytic Strategy

To understand how teachers' ratings of their principals relate to principal exits, we run linear probability regressions of principal exits on our measure of principal quality, and cluster standard errors at the school level.[4] Our main model specification is given in equation 1 which we estimate separately by the NYC and SASS samples.

$$(1) \qquad Exit_{ijkt} = \beta_0 + \beta_1 PrinQuality_{ijkt} + \beta_2' T_{jkt} + \beta_3' P_{ijkt} + \beta_4' X_{jkt} + \delta_k + \gamma_t + \varepsilon_{ijkt}$$

We predict whether principal *i* at school *j* located in NYC community district or SASS state *k* exits at the end of year *t* as a function of the teachers' aggregated and standardized ratings of the principal's quality ($PrinQuality_{ijkt}$); vectors of teacher, principal, and student characteristics (T_{jkt}, P_{ijkt}, and X_{jkt}, respectively); jurisdiction fixed effects (δ_k, community district fixed effects in the NYC models and state fixed effects in the SASS models), and year fixed effects (γ_t).

Our control variables vary somewhat across the NYC and SASS samples due to differences in the data collected in each setting. We control for principal race, gender, and years

of experience (in their current school and at other schools) for both samples. With respect to teacher characteristics, we control for teacher race for both the NYC and SASS models, but are able to control for a richer set of teacher covariates for NYC models by including teacher gender, salary, and years of experience. We capture differences in student characteristics across principals in both the NYC and SASS models by controlling for the proportion of minority students, whether or not the school met AYP, and the grade level of the school. In the NYC models we include the proportion of FRPL-eligible students (as a proxy for socio-economic status) while in the SASS models we include the school's rurality status.

We augment these observed characteristics with jurisdiction and year fixed effects to help account for unobservable differences between principals and their schools. NYC, as the largest district in the country, organizes its schools into smaller community and high school districts, each of which has its own superintendent. This allows us to include district fixed effects in our model to compare schools within a district, as well as control for any unobservable characteristics of the district that may offer competing hypotheses to our relationship of interest. In a similar vein, we control for state fixed effects in the SASS model to account for unobservable state-specific characteristics that may similarly influence both our dependent variable and our main independent variable, while also ensuring that we are conducting within-state comparisons. Finally, because we examine our relationship of interest over four years for NYC and across two waves of the SASS data, we include year fixed effects to conduct a within-year comparison and to control for any year-specific unobservable influences. As discussed previously, within the NYC sample, questions relating to the principal as well as the scale of ratings changed over time. The inclusion of year fixed effects also accounts for any resulting variation in the principal quality measure across years.

While we include a host of covariates as well as jurisdiction and year fixed effects, we are not making any causal claims about principal quality and principal turnover. It could be that because principals know that their teachers do not think of them favorably, they leave their position. This paper does not try to tease apart the directionality of the observed relationship either, instead focusing on whether higher or lower quality principals, as rated by the teachers at their schools, are more likely to exit. Despite these limitations, our analysis offers a way to estimate principal quality – an undertaking that has proven challenging in the past. Our work also presents a novel insight into how principal quality relates to principal turnover by examining our research question across principal characteristics, school contexts, and time.

Results

We begin by showing results for our main model. We then run a series of alternate specifications to assess whether findings from our main model can be explained by competing hypotheses and whether they are robust to a variety of contexts.

Main Model

Our main results for both the NYC and SASS samples consistently show that principal quality is negatively correlated with principal exits; higher quality principals are less likely to turn over (Table 2). The relationship is remarkably robust for both samples as we include additional control variables moving from the simple correlation between principal quality and principal turnover (Column 1) to adding year fixed effects (Column 2), principal characteristics (Column 3), teacher characteristics (Column 4), school characteristics (Column 5), and, finally, district fixed effects (Column 6), enabling us to rule out numerous competing hypotheses. The results from our preferred model specification (Column 6) indicate that, after controlling for the full set of covariates, a one standard deviation increase in principal quality corresponds to a

statistically significant 2.1 percentage point decrease in the likelihood of a NYC principal leaving. With the average principal turnover rate for NYC at 12 percent, a one standard deviation change in principal quality represents 17.5 percent of the total turnover, making the results substantively meaningful as well. On the national level, a one standard deviation increase in principal quality predicts a 3.4 percentage point decrease in principal exits or 16.7 percent of the average turnover among principals in the SASS sample.

{Insert Table 2 about here}

Robustness Checks

Even though our preferred specifications yield very similar and consistent results for both the local and national samples, we might be concerned that despite our rich set of covariates, we are detecting spurious associations between principal quality and principal turnover. To address this concern, we estimate a series of models with alternative specifications as robustness checks.

Construction of principal quality variable. It may be that our results are unique to the specific way in which we have chosen to create our principal quality measures. We chose to use the full set of questions from each survey so as to get as comprehensive a rating as possible despite the questions differing between the surveys and across waves in NYC. To ascertain whether this decision influences our results, we identify a set of questions in the NYC surveys that closely resemble those from the SASS surveys (see asterisked questions in Table A1 in the appendix). These alternate NYC principal quality measures are created following the same process as before. The association between principal quality and principal turnover remains unchanged: a one standard deviation increase in principal quality correlates to a 2.1 percentage point decrease in the likelihood of principals exiting (Table 3, Column 1). Our NYC finding is not driven by differences in the composition of the principal quality measure.

{Insert Table 3 about here}

Lagged Ratings. Another concern is that teachers may respond differently to questions in the principal's last year in their position. Specifically, teachers may rate principals lower knowing that they are about to leave, or principals may perform less than optimally because they are about to leave, resulting in lower ratings. To address this "last year" effect, we run our main model replacing teacher ratings of their principal with their ratings of their principal from the prior year. Because we do not have the data to do this for the SASS, our analysis is limited to NYC and necessarily excludes the first year of data.

Using teachers' lagged ratings of the principal, principal quality continues to be negatively associated with principal turnover. A one standard deviation increase in principal quality corresponds to a statistically significant 1.6 percentage point decrease in the likelihood of a principal exiting (Table 3, Column 2). Although the relationship has attenuated relative to our main model (a 2.1 percentage point decrease), this decrease appears to be explainable by the forced exclusion of the 2012-13 academic year and all first-year principals. Estimating our main model specification on this reduced sample reveals a nearly identical 1.5 percentage point decrease (Table 3, column 3), implying that teachers do in fact consistently rate principals.

Voluntary turnover. A principal involuntarily exits when the superintendent decides not to renew the principal's employment contract. Superintendents of each of NYC's smaller community and high school districts have control over principal contracts in their district. Changes in superintendents from one year to the next may therefore affect principal turnover. Although the data do not indicate if a principal exits voluntarily or involuntarily, we exploit this feature in the NYC sample to control for this source of involuntary exit by adding district-by-year fixed effects to our main model. The result is little changed—a one standard deviation

increase in principal quality corresponds to a statistically significant 2.0 percentage point decrease in the likelihood of the principal exiting (Table 3, column 4), suggesting teacher ratings predict voluntary exits.

Retirement. Another cause of principal departures, retirement, may also be driving our results if principal age is correlated with teacher ratings of their leadership. We therefore run our preferred model for principals not of retirement age, i.e. less than or equal to 55 years of age (Table 4). In NYC, we exclude the 2015-16 wave as we are missing age data for 11 percent of the principals. Again, this alternative model specification returns very similar results: a one standard deviation increase in principal quality is statistically significantly associated with a 2.0 percentage decrease in the likelihood of a principal leaving in NYC (column 1) and a 3.4 percentage point decrease in the SASS sample (column 2). Our main results are not influenced by age-related turnover.

{Insert Table 4 about here}

Collegiality. It may be that the consistent relationship that we find between principal quality and principal turnover actually reflects teachers' general perception about the school's environment and climate, and are not specifically evaluative of the principal's quality. Teachers could be unhappy with the level of collegiality they feel with other teachers at their school, and could be expressing this general level of discontent in their ratings of their principal. We therefore construct a measure of teacher collegiality leveraging the relevant questions from both the NYC and SASS surveys (see Table A4 in the appendix for the wordings of the survey questions) using the same method as we did to create principal quality measures. The collegiality measure for the NYC sample has a mean of 0.47 and a standard deviation of 0.19, and a mean of 0.38 and a standard deviation of 0.27 for the SASS sample.[5]

It is likely that teachers' general perceptions of the school colors their interaction with their principal. In fact, teacher ratings of principal quality are highly correlated with teacher ratings of collegiality. Specifically, in the NYC sample, measures of school climate and principal quality have a 0.74 correlation, and they share a 0.60 correlation in the SASS sample. To ensure that teacher ratings of their principals do not include their views about other aspects of the school, we add the measure of collegiality to our main model.

Yet, again, this alternative model specification has little effect on our main coefficient of interest (Table 4, Columns 3 and 4). Principal quality continues to have a negative and statistically significantly association with principal turnover. Teachers are separately identifying their satisfaction with their principals from their perceptions of other factors of the school. Further, teacher ratings of collegiality do not predict principal turnover, indicating that principals' departures from their roles are likely not influenced by levels of teacher collegiality.

Mobility. Related to whether principal quality is associated with departures is whether principal quality predicts what they do next. This distinction helps us understand labor market choices of more and less effective principals, and provides more information on the principal pipeline and workforce composition. For instance, if less effective principals are more likely to relocate to other schools, we may just be recycling ineffective principals and not really resolving the concerns that are attached to lower quality leaders leading schools.

The SASS sample distinguishes principal departures between those that transfer between schools versus those leaving the principalship altogether.[6] We run our main model separately for principals who move schools (Table 5, Column 1) and for principals who leave the principalship altogether (Table 5, Column 2), relative to staying, in order to explore this issue. Results show that a one standard deviation increase in principal quality is correlated with a 1.8 percentage

point decrease in the likelihood of principals moving to another school, and a 1.7 percentage point decrease in the likelihood of principals leaving. Both results are statistically significant, indicating that while principal quality is related to principal turnover, it does not share a differential relation with the type of turnover.

{Insert Table 5 about here}

Heterogeneous Effects

Across the many variations of models presented above, we continue to see a consistent result, lending support to our main effects: principal turnover is negatively correlated with principal quality—higher quality principals as measured by teacher ratings are less likely to turn over. We now examine how the association may differ with principal experience, academic year, and student characteristics. For each factor, we divide principals into groups and estimate separate models for each group to allow the associations of all the covariates with principal turnover to vary across the groups.

Experience. Principal quality varies with the number of years at the school (Branch et al., 2008); however, it is unclear if and how the relationship between principal quality and principal turnover varies with experience. It could be that as principals gain more experience and improve in quality, they are comfortable remaining at their same schools. Conversely, more experienced and higher quality principals may realize their prospects for better jobs, and may therefore be more likely to leave. To examine this relationship empirically, we evaluate if the association between principal quality and turnover varies with principals' levels of experience. We divide principals into groups by their experience in the school—first year in the school, second year in the school, third-fourth year in the school, fifth-tenth year in the school, and more than 10 years in the school.

For NYC, we see that for each level of experience other than more than 10 years in the school, teacher ratings negatively and statistically significantly predict principal turnover (Table 6). A post-estimation test using seemingly unrelated regressions (SUR) shows that the coefficients from each of these models are in fact not different from each other. We similarly run fully parametrized models for the SASS (Table 6) and find that across the levels of principal experience, principal quality consistently and negatively predicts principal turnover. Here, a SUR test suggests that the coefficients from the models for 3rd-4th year principals and principals who have more than 10 years of experience at their schools are statistically different. The magnitudes of the association between principal quality and principal turnover do vary between these two models, but the directionality remains the same. It does seem that principal quality has a relatively weaker association with principal turnover for principals who have been at their schools for more than 10 years in both samples, implying that more experienced principals may be less responsive to quality indicators when considering their mobility decisions.

{Insert Table 6 about here}

Academic Year. It could also be that principal quality has a differential relationship with principal turnover over time that the year fixed effects we include in our preferred model specification are absorbing. For the NYC sample, principal quality is negatively associated with the likelihood of principal exits across all years (Table 7). However, the relationship is the largest for 2012-13 (Column 1), not statistically significant for 2013-14 (Column 2), and statistically significant at the 10 percent level for 2015-16 (Column 4). Results from SUR tests, however, suggest that none of the coefficient across the years are statistically significantly different from each other, indicating that while the relationship of interest may be stronger in

some years than in others, it appears to persist across all years. The SASS models show a similar pattern of results (columns 5 and 6).

{Insert Table 7 about here}

Student Characteristics. Principals tend to leave schools that serve greater proportions of minority and low-income students for schools that are relatively more "advantaged" (Loeb et al., 2010). If higher quality principals are more likely to leave these high-need schools, the adverse effects of principal turnover may further harm the students in these schools. To understand the extent of this possibility, we examine whether our main finding varies by the student populations that schools serve.

We explore the relationship between principal quality and principal turnover by levels of student characteristics. For both school minority student share and school free and reduced-price lunch share, we group schools into 20-percentage-point groups (0-20%, 21-40%, 41-60%, 61-80%, and 81-100%). We only observe school free and reduced-price lunch share in NYC where fewer than 5 percent of schools fall into the lowest group (20 percent or fewer students eligible). We therefore collapse the first two groups into a single group.

Our results show limited heterogeneity in the association between principal quality and principal turnover across school minority student share, but the results are not consistent across the two samples. For NYC, principal quality is only statistically significantly correlated with principal turnover for schools with the greatest concentration of minority students (Table 8, column 5): a one standard deviation increase in principal quality is associated with a 2.9 percentage point decrease in the likelihood of the principal exiting. The SUR tests tell us that, while the point estimates vary across the groups, principal quality is only differentially associated with principal turnover between the schools with the highest and lowest

concentrations of minority students – higher quality principals are less likely than lower quality principals to turn over in high minority share schools than in low minority share schools. This is the opposite of the pattern found in the teacher literature. None of the other point estimates, however, differ statistically from each other, implying that the relationship persists across most schools. In the SASS sample, on the other hand, principal quality is negatively and statistically significantly correlated with principal turnover across all the groups with the magnitude of this association ranging between a 2.1 and a 5.9 percentage point decrease (Table 8). Here again, most of the SUR tests indicate that principal quality is not differentially associated with turnover across school minority share. The exceptions, however, mirror the teacher literature. The difference in the turnover probability between a higher and lower quality principal is smaller in schools with 41%-60% minority students than in schools with fewer minority students (0-20% and 21-40%), echoing the teacher literature.

{Insert Table 8 about here}

We find no evidence that principal quality is differentially associated with principal turnover based on the socio-economic status of the students in a school (Table 9). Although the association is only significant in two of the four groups, none of the coefficients differ statistically from each other, implying that principal quality has a similar negative relationship with principal turnover across schools in these groups.

{Insert Table 9 about here}

Discussion

Our analyses show consistent evidence that principals who receive higher quality ratings from their teachers are less likely to leave their positions than those who receive relatively lower quality ratings. The principalship is a multifaceted job, and as the questions we used to construct

the principal quality measures across the surveys indicate, we may be measuring different aspects of that job. Despite this, our findings are strikingly consistent. Teacher ratings of principals' leadership explains about one-fifth of the total variation in school departures. Schools are, on average, more likely to lose principals who are relatively less effective, suggesting, that, to the extent that principal turnover is a problem, it does not appear to be driven by higher quality principals.

Our main result also echoes findings from the teacher literature, where more effective teachers are less likely to leave schools (Boyd, Lankford, Loeb, Ronfeldt, & Wyckoff, 2011; Author, 2011). The similarities suggest that more effective school personnel, on average, are more likely to remain in their roles at their schools. We find no consistent evidence that higher quality principals are differentially likely to exit more versus less disadvantaged schools. Although we are unable to explore the mechanism through which this association operates, principals are either aware of their teachers' perceptions of them or their sense of their quality maps onto teachers' perceptions and they make labor market decisions accordingly.

Regardless of how the association operates, our findings offer encouraging news for the field along with some policy implications. If higher quality principals are in fact more likely to remain at their schools, broad emphasis on reducing overall principal turnover might be somewhat misplaced and districts should instead focus on recruiting more higher quality principals, which might naturally reduce principal turnover and the related negative consequences. Our findings indicate that at least some principal turnover appears "well-informed", i.e. lower quality principals are leaving schools, vacating the position to perhaps be filled by a higher quality principal.

This is one of the key policy-relevant question this study leaves unanswered. Who are principals replaced by when they leave? If they are replaced by principals of similar quality, then students and teachers at those schools are not any better off having the principal leave. Understanding the quality of replacement principals will help add more nuance to the issue of principal turnover. A related issue is whether principal effectiveness is situational. It could be that a principal who is ineffective in one school is effective in another. Following principals who switch schools would allow us to begin examining these questions and shed more light on the complex relationship between principal turnover and principal quality. Unfortunately, our current data do not include enough such transitions to warrant an exploration.

This paper is one of only a few to shed light on the interplay between principal quality and principal turnover. Higher quality principals are less likely to exit their schools, implying that at least some of the principal turnover we observe in schools might be part of an efficient system in which ineffective principals are sorting (voluntarily or involuntarily) into other positions. Moving forward, research should focus on enriching our understanding of differential attrition patterns so that efforts to retain principals can be better targeted. Researchers should also continue to seek ways to target improvement of existing principals. Such efforts would reflect the findings presented in this paper and ultimately lead to better outcomes for students.

Notes

[1] All sample sizes for the SASS are rounded to the nearest 10 to comply with NCES reporting requirements.

[2] Up until 2013, NYCDOE assigned schools grades based on a number of topics, including "School Environment." The NYC School Surveys would serve as the basis for determining these grades. These grades would then feed into the creation of a Progress Report for each school. After 2013, NYCDOE replaced the Progress Reports with School Quality Reports, which are solely based on the results of the NYC School Surveys. The Progress Reports were used as a school accountability tool, while the Quality Reports are used to create school improvement plans and are available online for the public to see.

[3] There are a few questions that are also rated on a four-point Likert scale but are worded differently (4 = to a great extent and 1 = to no extent). When converting these to binaries, we follow the same rule where 1 = to a great extent; 0 otherwise. See the appendix for more information on the creation of these measures.

[4] We also confirm our results using logit regressions. Available from authors on request.

[5] Upon conducting a factor analysis on collegiality questions for each year for NYC, only one factor has an eigenvalue greater than 1. Cronbach's alphas for these questions are 0.7 for 2013 and 2014, and greater than 0.9 for 2015 and 2016. Collegiality questions on the SASS also load onto only one factor with an eigenvalue greater than 1, and alpha reliability coefficients for these questions in each wave are greater than 0.72.

[6] While we are able to distinguish principal exits as movers versus leavers, there are too few movers to run a separate model—only 10-25 principals move to the principalship at another school in any given year.

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Table 1. Variable Means and Standard Deviations, NYC and SASS Samples

	NYC	SASS		NYC	SASS
Principal Turns Over	0.120	0.204	**School Characteristics**		
	(0.325)	(0.403)	Percent Students Minority		0.366
Teacher Rating of Principal	0.450	0.439			(0.329)
	(0.201)	(0.248)	Percent Students Black	0.321	
Principal Characteristics				(0.276)	
Principal Experience at Other School	0.398	3.239	Percent Students Hispanic	0.422	
	(1.468)	(5.151)		(0.256)	
Principal Experience at This School	5.621	4.338	Percent Students White	0.124	
	(4.347)	(4.717)		(0.191)	
Principal Female	0.678	0.415	Percent Students Race Other	0.133	
	(0.467)	(0.493)		(0.178)	
Principal Minority		0.133	Percent Students Free and Reduced Price Lunch	0.804	
		(0.340)		(0.194)	
Principal Black	0.291		Elementary School	0.408	0.490
	(0.454)			(0.491)	(0.500)
Principal White	0.484		Secondary School		0.382
	(0.500)				(0.486)
Principal Hispanic	0.186		Middle School	0.178	
	(0.389)			(0.382)	
Principal Race Other	0.039		High School	0.254	
	(0.193)			(0.435)	
Years Teacher at Other School	3.093		Junior High School	0.058	
	(1.619)			(0.234)	
Years Teacher at This School	6.715		PreK-8 School	0.095	
	(3.378)			(0.293)	
Teacher Characteristics			PreK-12 School	0.007	
Teacher Female	0.763			(0.082)	
	(0.160)		Elementary and Secondary School	0.129	
Teacher Minority		0.130		(0.335)	
		(0.214)	School Met AYP	0.424	0.608
Teacher Black	0.213			(0.494)	(0.488)
	(0.213)		City		0.210
Teacher White	0.551				(0.407)
	(0.233)		Suburb		0.234
Teacher Hispanic	0.149				(0.424)
	(0.135)		Town		0.180
Teacher Race Other	0.087				(0.385)
	(0.080)		Rural		0.375
Log of Teacher Salary	11.197				(0.484)
	(0.093)				

Note. The NYC sample includes 5,895 schools and the SASS sample includes 14,190 schools.

Table 2. Selected Coefficients from Models Predicting Principal Exit, NYC and SASS Samples

	(1)	(2)	(3)	(4)	(5)	(6)
NYC						
Teacher Rating of Principal	-0.024***	-0.024***	-0.024***	-0.024***	-0.022***	-0.021***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
N	5895	5895	5895	5895	5895	5895
Adjusted R^2	0.005	0.006	0.014	0.026	0.027	0.035
SASS						
Teacher Rating of Principal	-0.035***	-0.035***	-0.033***	-0.033***	-0.032***	-0.034***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
N	14120	14120	14120	14120	14120	14120
Adjusted R^2	0.007	0.008	0.013	0.016	0.018	0.023
Year Fixed Effects		Yes	Yes	Yes	Yes	Yes
Principal Chars			Yes	Yes	Yes	Yes
Teacher Chars				Yes	Yes	Yes
School Chars					Yes	Yes
District/State Fixed Effects						Yes

Notes. ***p<0.001. Robust standard errors in parentheses are clustered at the school level. Teacher ratings have been standardized. See Table 1 for a description of the control variables.

Table 3. Selected Coefficients from Models with Alternative Specifications Predicting Principal Exit, NYC Sample

	Similar Questions to SASS	**Lagged Teacher Ratings**	**Current Ratings on Lagged Sample**	**District-by-Year Fixed Effects**
	(1)	(2)	(3)	(4)
Teacher Rating of Principal	-0.021***	-0.016*	-0.015*	-0.020***
	(0.005)	(0.006)	(0.006)	(0.005)
N	5895	3857	3857	5895
Adjusted R^2	0.035	0.045	0.045	0.035
Sample Mean	0.120	0.125	0.125	0.120

Notes. *p<0.05, ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Table 4. Selected Coefficients from Models with Alternative Specifications Predicting Principal Exit, NYC and SASS Samples

	Restrict Sample to Non-Retirement-Age Principals		**Include Teacher Ratings of Collegiality as Control**	
	NYC	*SASS*	*NYC*	*SASS*
	(1)	(2)	(3)	(4)
Teacher Rating of Principal	-0.020***	-0.034***	-0.020**	-0.040***
	(0.005)	(0.004)	(0.007)	(0.004)
N	4203	10530	5895	14120
Adjusted R^2	0.029	0.019	0.035	0.024
Sample Mean	0.090	0.183	0.120	0.204

Notes. **p<0.01, ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Table 5. Selected Coefficients from Models Predicting Principals Moving Across Schools or Leaving the Principalship, SASS Sample

	Move vs. Stay	**Leave vs. Stay**
	(1)	(2)
Teacher Rating of Principal	-0.018***	-0.017***
	(0.003)	(0.003)
N	12150	12870
Adjusted R^2	0.014	0.019
Sample Mean	0.075	0.127

Notes. ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Table 6. Selected Coefficients from Models Predicting Principal Exit Estimated Separately by Principal Experience at the School, NYC and SASS Samples

	1 Year	**2 Years**	**3-4 Years**	**5-10 Years**	**More than 10 Years**
	(1)	(2)	(3)	(4)	(5)
NYC					
Teacher Rating of Principal	-0.035**	-0.031**	-0.024*	-0.019*	-0.007
	(0.012)	(0.011)	(0.011)	(0.008)	(0.014)
N	678	700	1159	2338	1020
Adjusted R^2	0.041	0.067	0.046	0.017	0.007
Sample Mean	0.108	0.067	0.133	0.117	0.156
SASS					
Teacher Rating of Principal	-0.036***	-0.037***	-0.045***	-0.030***	-0.019†
	0.009	0.009	0.007	0.006	0.010
N	2390	2210	3300	4500	1720
Adjusted R^2	0.031	0.030	0.033	0.022	0.011
Sample Mean	0.187	0.205	0.196	0.212	0.221

Notes. †p<0.1, *p<0.05, **p<0.01, ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Table 7. Selected Coefficients from Models Predicting Principal Exit Estimated Separately by Survey Wave, NYC and SASS Samples

	NYC Sample				**SASS Sample**	
	2012-13	*2013-14*	*2014-15*	*2015-16*	*2007-08*	*2011-12*
	(1)	(2)	(3)	(4)	(5)	(6)
Teacher Rating of Principal	-0.032***	-0.007	-0.023*	-0.017†	-0.028***	-0.040***
	(0.009)	(0.010)	(0.010)	(0.009)	(0.005)	(0.005)
N	1453	1472	1500	1470	7060	7050
Adjusted R^2	0.007	0.033	0.060	0.050	0.027	0.022
Sample Mean	0.111	0.116	0.140	0.112	0.196	0.212

Notes. †p<0.1, *p<0.05, ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Table 8. Selected Coefficients from Models Predicting Principal Exit Estimated Separately by School Minority Share, NYC and SASS Samples

	0-20%	**21-40%**	**41-60%**	**61-80%**	**81-100%**
	(1)	(2)	(3)	(4)	(5)
NYC					
Teacher Rating of Principal	0.004	-0.020	-0.021	-0.018	-0.029***
	(0.016)	(0.013)	(0.017)	(0.015)	(0.006)
N	431	672	541	609	3637
Adjusted R^2	0.040	0.053	0.040	0.016	0.045
Sample Mean	0.109	0.085	0.104	0.108	0.132
SASS					
Teacher Rating of Principal	-0.029***	-0.037***	-0.021*	-0.059***	-0.039***
	(0.005)	(0.008)	(0.010)	(0.013)	(0.009)
N	6310	2530	1740	1170	2370
Adjusted R^2	0.014	0.022	0.011	0.034	0.039
Sample Mean	0.184	0.186	0.212	0.235	0.255

Notes. *p<0.05, ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Table 9. Selected Coefficients from Models Predicting Principal Exit Estimated Separately by School Free/Reduced-Price Lunch Share, NYC Sample

	0-40%	**41-60%**	**61-80%**	**81-100%**
	(1)	(2)	(3)	(4)
Teacher Rating of Principal	-0.012	-0.024	-0.022*	-0.023***
	(0.019)	(0.019)	(0.011)	(0.006)
N	339	440	1303	3810
Adjusted R^2	0.008	0.055	0.027	0.034
Sample Mean	0.097	0.136	0.122	0.119

Notes. *p<0.05, ***p<0.001. Robust standard errors in parentheses are clustered at the school level. All models include the full set of control variables described in Table 1.

Appendix

New York City and Schools and Staffing Survey Factor Analysis

The principalship is a multifaceted job, making the measurement of principal quality for all aspects of leadership a challenging task. Surveys like NYC and the SASS therefore ask a number of questions to get at least some of these facets. We combine all questions pertaining to the principal into a single measure of principal quality for both the NYC and the SASS samples. To assess whether these questions are capturing one or more dimensions of principal leadership, we follow the approach of Kraft, Marinell, and Yee (2016) and conduct a factor analysis on teacher ratings of their principals for each survey wave. We use a principal component analysis to identify the number of leadership dimensions towards which the questions may be converging. For each wave, all questions fall into a single component (eigenvalue > 1) which explains between 83 and 86 percent of the total variance. We then apply both orthogonal as well as oblique rotations to further differentiate between the latent factors that these questions may be capturing. For the 2012-13 and 2013-14 school years for NYC, both rotations continue to identify only one underlying measure of leadership quality. For the 2014-15 and 2015-16 school years, however, both rotations present two dimensions of leadership quality. Upon examining the relevant questions for these years, we find that based on the factor loadings, questions can be categorized either as measures of principals' general management skills or as measures of principals' instructional leadership abilities. The second component for both years has an eigenvalue that is barely greater than one (1.0218 for 2015 and 1.0702 for 2016), relative to the eigenvalue for the first component (12.9956 for 2015 and 12.8349 for 2016). Both components for both years also correlate at values of around 0.8. Given this information, we collapse all questions for each year onto one dimension of leadership quality. For the SASS sample, for both

waves, orthogonal and oblique rotations continue to identify only one latent construct of principal quality.

Table A1. NYC Questionnaire Items Included in Teacher Ratings of Principal Factors by Survey Wave

2012-13
(1*) The principal at my school communicates a clear vision for our school; (2) The principal at my school understands how children learn; (3) The principal at my school knows what's going on in my classroom; (4) The principal at my school participates in instructional planning with teachers; (5) The principal at my school encourages open communication on important school issues; (6) The principal at my school makes clear to the staff his/her expectations for meeting instructional goals; (7*) The principal at my school is an effective manager who makes the school run smoothly; (8) School leaders provide time for collaboration among teachers; (9) School leaders give me regular and helpful feedback about my teaching; (10) School leaders place a high priority on the quality of teaching; (11*) School leaders publicly recognize teachers for their accomplishments; (12) School leaders provide teachers with leadership opportunities; (13*) To what extent do you feel supported by your principal?; (14) I feel respected by the principal at my school; (15) I trust the principal at his or her word; (16) The principal at my school places the learning needs of children ahead of personal and political interests; (17) School leaders visit classrooms to observe the quality of teaching at my school
2013-14
(1*) The principal at my school communicates a clear vision for our school; (2) The principal at my school understands how children learn; (3) The principal at my school knows what's going on in my classroom; (4) The principal at my school participates in instructional planning with teachers; (5) The principal at my school encourages open communication on important school issues; (6) The principal at my school makes clear to the staff his/her expectations for meeting instructional goals; (7*) The principal at my school is an effective manager who makes the school run smoothly; (8) School leaders provide time for collaboration among teachers; (9) School leaders give me helpful feedback about my teaching; (10) School leaders place a high priority on the quality of teaching; (11*) School leaders publicly recognize teachers for their accomplishments; (12) School leaders provide teachers with leadership opportunities; (13*) To what extent do you feel supported by your principal?

2014-15

(1) The principal at this school (not asst principal) makes clear to the staff his/her expectations for meeting instructional goals; (2*) The principal at this school (not asst principal) communicates a clear vision for this school; (3) The principal at this school (not asst principal) understands how children learn; (4) The principal at this school (not asst principal) sets high standards for student learning; (5) The principal at this school (not asst principal) sets clear expectations for teachers about implementing what they have learned in professional development; (6) The principal at this school (not asst principal) carefully tracks student academic progress; (7) The principal at this school (not asst principal) knows what's going on in my classroom; (8) The principal at this school (not asst principal) participates in instructional planning with teams of teachers; (9) I feel respected by the principal at this school; (10*) The principal at this school is an effective manager who makes the school run smoothly; (11) The principal has confidence in the expertise of the teachers at this school; (12) I trust the principal at his/her word; (13) At this school, it's ok to discuss feelings, worries, and frustrations with the principal; (14) The principal takes a personal interest in the professional development of teachers; (15) The principal looks out for the personal welfare of the staff members; (16) The principal places the needs of children ahead of personal interests

2015-16

(1) The principal/school leader at this school makes clear to the staff his/her expectations for meeting instructional goals; (2) The principal/school leader at this school communicates a clear vision for this school; (3) The principal/school leader at this school understands how children learn; (4) The principal/school leader at this school sets high standards for student learning; (5) The principal/school leader at this school sets clear expectations for teachers about implementing what they have learned in professional development; (6) The principal/school leader at this school carefully tracks student academic progress; (7) The principal/school leader at this school knows what's going on in my classroom; (8) The principal/school leader at this school participates in instructional planning with teams of teachers; (9) I feel respected by the principal at this school; (10*) The principal at this school is an effective manager who makes the school run smoothly; (11) The principal has confidence in the expertise of the teachers at this school; (12) I trust the principal/school leader at his/her word (to do what he/she says that he or she will do); (13) At this school, it's ok to discuss feelings, worries, and frustration with the principal; (14) The principal takes a personal interest in the professional development of teachers; (15) The principal looks out for the personal welfare of the staff members; (16) The principal places the needs of children ahead of personal interests; (17) The principal/school leader encourages feedback through regular meetings with parents and teacher leaders

Notes. * Indicates questions that map onto the SASS questions listed in Table A2.

Table A2. SASS Questionnaire Items Included in Teacher Ratings, 2007-08 and 2011-12

(1) The school administration's behavior toward the staff is supportive and encouraging; (2) My principal enforces school rules for student conduct and backs me up when I need it; (3) The principal knows what kind of school he or she wants and has communicated it to the staff; (4) In this school, staff members are recognized for a job well done; (5) I like the way things are run at this school

Table A3. NYC and SASS Questionnaire Items Included in Teacher Collegiality Factors

NYC 2012-13 and 2013-14
(1) Teachers in my school trust each other; (2) Teachers in my school work together on teams to improve their instructional practice; (3) To what extent do you feel supported by the other teachers at your school?
NYC 2014-15
(1) At this school teachers talk about instruction in the teacher's lounge, faculty meetings, etc.; (2) At this school teachers share/discuss students' work with other teachers in this school; (3) At this school teachers design instructional programs together; (4) At this school teachers make a conscious effort to coordinate their teaching with instruction at other grade levels; (5) At this school the principal, teachers, and staff collaborate to make this school run effectively; (6) At this school most teachers are cordial with one another; (7) Teachers in this school trust each other; (8) In this school, it's okay to discuss feelings, worries, and frustrations with other teachers; (9) Teachers respect other teachers who take the lead in school improvement efforts; (10) I feel respected by other teachers at this school; (11) Teachers at this school respect those colleagues who have a specific expertise
NYC 2015-16
(1) At this school, teachers talk about instruction in the teachers' lounge, faculty meetings, etc.; (2) At this school, teachers design instructional programs together; (3) At this school, teachers make a conscious effort to coordinate their teaching with instruction at other grade levels; (4) At this school, the principal, teachers and staff collaborate to make this school run effectively; (5) Teachers in this school trust each other; (6) It's ok in this school to discuss feelings, worries, and frustrations with other teachers; (7) Teachers respect other teachers who take the lead in school improvement efforts; (8) I feel respected by other teachers at this school; (9) Teachers at this school respect those colleagues who have a specific expertise
SASS 2007-08 and 2011-12
(1) Most of my colleagues share my beliefs and values about what the central mission of the school should be; (2) There is a great deal of cooperative effort among staff members