Executive Summary
February 2011

The Research Alliance for New York City Schools

The Middle School Teacher Turnover Project

A Descriptive Analysis of Teacher Turnover in
New York City’s Middle Schools

William H. Marinell
The Research Alliance for New York City Schools

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Acknowledgements

While there is one author listed on the title page of this report, many individuals contributed to this report and to the analyses on which it is based. James Kemple, the Executive Director of the Research Alliance for New York City Schools, provided invaluable guidance about the design and execution of the analyses, as well as thoughtful and thorough critique of drafts of this report and its accompanying Executive Summary and Technical Appendix. Jessica Lent, Janet Brand, and Micha Segeritz, all Research Alliance colleagues, provided critical analytical and data management support at various points. The members of our larger research team – Richard Arum (NYU), Aaron Pallas (Teachers College, Columbia), Jennifer Goldstein (Baruch College, CUNY) and doctoral students Amy Scallon, Travis Bristol, and Barbara Tanner – contributed constructive feedback throughout the analytical process. Jim Wyckoff, Sean Corcoran, and Morgaen Donaldson offered candid, extremely valuable critique of the study’s technical and substantive merits, as did the New York City Department of Education’s research team led by Jennifer Bell-Ellwanger. Members of the Research Alliance’s Governance Board identified findings that might resonate with various stakeholders in the New York City public education system. Research Alliance staff members Lori Nathanson, Tom Gold, Adriana Villavicencio, and Jessica Lent helped revise this report and its accompanying documents.

The Middle School Teacher Turnover Project and this report were supported by a grant from The Ford Foundation. The Research Alliance for New York City Schools is supported by core funding from the Bill and Melinda Gates Foundation and the Robertson Foundation.

This paper reflects interpretations of the author. Readers should not infer any endorsement of the findings or interpretations on the part of the New York City Department of Education or on the part of those who reviewed earlier drafts and provided guidance to the author.
Executive Summary

Several recent studies and a high profile report have underscored the importance of learning more about the causes and consequences of teacher turnover in New York City’s middle schools. One recent investigation found that rates of turnover were higher among first-year New York City middle school math teachers than among elementary teachers and that the most effective middle school math teachers who left their schools after one year tended to leave the lowest-performing schools. Further, a panel of experts recently noted that many of New York City’s middle schools possess characteristics associated with high rates of turnover, such as large percentages of underperforming students and high rates of principal turnover. Given the role that students’ performance in middle school can have on their progress towards post-secondary work and study, it seems critical to learn more about middle school teacher turnover in order to help schools develop strategies for recruiting, developing and retaining effective teachers, while simultaneously limiting turnover’s damaging consequences.

To date, however, there has not been a comprehensive resource that addresses central questions related to New York City middle school teacher turnover and identifies important avenues for future research. The Research Alliance for New York City Schools aims to fill this gap through a three-year, mixed-methods study of New York City middle school teacher turnover. The goals of this project are to describe the rates and patterns of turnover over the past decade, identify middle school teachers’ career plans and their impressions of their schools, and examine the causes and consequences of turnover in middle schools that serve high-need student populations. This project is a collaboration among researchers at Baruch College (City University of New York), Teachers College (Columbia), and New York University. The study is organized into three components, each of which investigates questions related to turnover using one of the following sources of data: the New York City Department of Education’s human resources administrative records, an original survey of middle school teachers, and case studies of four middle schools.

This report presents findings from the first of the study’s three components. Using human resources data from 2001 to 2010, this study identifies the characteristics of New York City middle school teachers, describes the rates and patterns of turnover over the past decade, and investigates the relationship between turnover and the characteristics of middle school teachers and middle schools. In doing so, the report aims to address foundational questions related to turnover and to identify some key questions that future studies – including the survey and case study components of this larger project – should explore in order to gain a nuanced understanding of middle school teacher turnover.

Background

Teacher turnover is one of the more widely studied topics in K-12 education, and with good reason. Research indicates that high rates of teacher turnover can leave schools facing instructional, financial, and organizational costs, which can be difficult to surmount. While some degree of turnover can be constructive for organizations, a perpetual churning of teachers through schools requires that administrators devote scarce resources to recruiting and orienting new teachers. Further, turnover can compromise a school’s long-term objectives, such as its
efforts to promote a professional culture or strengthen its instructional core through sequential professional development.⁵

Evidence suggests that rates of teacher turnover may be particularly high in urban middle schools, especially those serving disadvantaged students. A recent study found that 60% of novice math teachers in low-performing middle schools left their schools within two years.⁶ This same study revealed a potentially vicious cycle, wherein the least effective middle school teachers rotate through the schools that serve the largest percentages of underperforming students and students from minority backgrounds.⁷ Outside of New York City, research has shown that middle schools have relatively high rates of out-of-field teaching, a factor that is associated with turnover, and that some middle school teachers view their assignments as stepping-stones to positions in elementary or high schools.

Methodology

This investigation employs a discrete-time survival analysis methodology to estimate the length of time that teachers remain in their schools. From these estimates, we generate statistics of the percentage of teachers who left their schools within various lengths of time (e.g., after their first year, within three years, etc.). The primary sample for this analysis is the 15,628 teachers who were new to one of New York City’s 196 Grade 6-8 middle schools between 2002 and 2009.⁸ The analysis follows these teachers’ careers from the time they enter their school until they either depart these schools or are censored by the data set in 2010.

Findings

These findings shed light on a number of the issues raised above and, more importantly, provide a context for future investigations of factors that influence, and are influenced by, teacher turnover within New York City’s middle schools.

How long do middle school teachers remain in their schools?

This question addresses a topic of central importance to school principals, school system administrators and organizations invested in preparing teachers for their work and developing their capabilities on the job: after teachers enter New York City middle schools, how long do they remain in their schools? On average, middle school teachers who entered their schools between 2002 and 2009 remained in these schools for roughly three years. More specifically, 27% of middle school teachers left their schools within one year, 55% within three years and 66% within five years. To situate these rates of turnover within the larger context of the New York City public school system, we estimated comparable rates of turnover among the elementary and high school teachers who were new to New York City schools during the same time period. Exhibit 1 illustrates the cumulative percentage of teachers who left New York City’s middle, elementary and high schools after various lengths of time. As the exhibit depicts, the rates of middle school turnover are either comparable or slightly higher than rates of turnover in elementary and high schools. For example, 55% of middle school teachers left their schools within three years, as compared with 46% of elementary school teachers and 51% of high school teachers. Exhibit 1 also demonstrates that, across all of these school levels, the steepest increases
in turnover occurred during teachers’ first few years in schools, after which turnover rates gradually leveled off.

![Exhibit 1](image)

**Exhibit 1**
The percentage of new-to-school middle, high and elementary school teachers who left their schools between 2002 and 2009

How have rates of middle school teacher turnover changed over the past decade?

To inform preliminary hypotheses about whether and how turnover may have been influenced by a number of factors – such as New York City’s movement towards an open-market hiring system – we examined whether rates of turnover changed between 2002 and 2007. These exploratory analyses revealed that rates of middle school teacher turnover declined slightly over this time period. More specifically, 57% of teachers who entered middle schools during the 2001-2002 school year left those schools within three years. Rates of turnover declined slightly among teachers who entered their schools over the subsequent five years. Among teachers who entered middle schools during the 2006-2007 school year, 52% left these schools within three years. This five percentage-point decrease in turnover rates between 2002 and 2007 represented a statistically significant negative linear trend; however, the small magnitude of this difference seemed less notable than the discovery that there was not a year during this time period when more than 50% of middle school teachers remained in their schools for longer than three years.
To what extent is turnover characterized by mobility between schools or attrition from the New York City public school system?

Future studies of middle school teachers’ career plans and of the factors that influence whether they remain in their schools, in the New York City public school system, or in teaching should be grounded in a descriptive analysis of teachers’ patterns of mobility and attrition. Data from the past decade reveal that both mobility (transferring between New York City schools) and attrition (leaving the New York City public schools altogether) have contributed to New York City middle school teacher turnover. Exhibit 2 illustrates the patterns of mobility and attrition among teachers who left their middle schools between 2002 and 2009. As the exhibit reveals, 59% of departing middle school teachers were not employed in the New York City public school system in the year after their departure (referred to as Leavers). By comparison, 41% of departing middle school teachers transitioned to another New York City public school (referred to as Movers). Further, as the exhibit indicates, 19% of all of the departing middle school teachers secured assignments in New York City public schools that did not include the middle grades (Grades 6-8). Twelve percent of all departing middle school teachers transitioned to middle schools with traditional Grade 6-8 configurations.

Which teacher characteristics are associated with turnover?

Historically, research on turnover has investigated the relationship between turnover and the characteristics of teachers and schools in an effort to help practitioners and policymakers identify which teachers leave schools and which types of schools they leave behind. Exhibit 3 depicts the percentage of teachers with various background characteristics who left their middle schools within three years. As this exhibit indicates, while these teacher characteristics are all statistically significant predictors of turnover, turnover rates are similar among teachers within many of the larger categories, such as race, gender, and subject area. For instance, roughly 50% of middle school teachers left their schools within three years, regardless of whether they were male or female, or from Black, Hispanic, or White racial/ethnic backgrounds. Similarly, the percentage of math and science middle school teachers who left their schools within three years did not differ notably from rates of turnover among their colleagues who teach other subjects.

There are a few notable exceptions to this general pattern of similarity between teachers’ characteristics and rates of turnover. More specifically, turnover rates varied across teachers of different ages, levels of experience, and degree credentials. For instance, among the teachers who entered their schools between 2002 and 2009, the teachers with the most experience in New York City schools were associated with the lowest rates of turnover (44% left their schools within three years). By contrast, 55% of teachers who had worked in New York City schools for three years or less left their schools within the same period of time. In addition, older and younger teachers were associated with higher rates of turnover than middle-aged teachers. More specifically, 61% of teachers aged 55-or-older and 54% of teachers aged 30-or-younger left their schools within three years. By comparison, 49% of teachers aged 30-55 left their schools within the same length of time.
Exhibit 2
Patterns of mobility and attrition among teachers who entered NYC middle schools between 2002 and 2009

NYC middle school teachers who entered their schools between 2002-09
(N = 18,019)

Departed schools during the period of observation
(N = 10,405)

“The Leavers”: Left the NYC public school system
59%

“The Movers”: Transferred to other NYC schools
41%

“The Stayers”: Remained in schools for the period of observation
(N = 7,614)

Remained teachers
37%

Assumed non-teaching roles
4%

Transitioned to schools that did not include grades 6-8
19%

Transitioned to schools that included grades 6-8
18%

High schools
8%

Elementary schools
5%

Schools with other grade configurations and ungraded schools
6%

Grade 6-8 middle schools
12%

Grade 6-12 schools
3%

Grade K-8 schools
3%
### Exhibit 3
Estimated percentage of middle school teachers who left their schools within three years
By selected teacher characteristics

<table>
<thead>
<tr>
<th></th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>***</td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>52</td>
<td>**</td>
</tr>
<tr>
<td>Hispanic</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td><strong>Years of experience in NYC schools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 years or less</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Between 3 and 6 years</td>
<td>50</td>
<td>***</td>
</tr>
<tr>
<td>Between 6 and 9 years</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>More than 9 years</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td><strong>Degree level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.A.</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>M.A. or credit equivalent</td>
<td>50</td>
<td>***</td>
</tr>
<tr>
<td>M.A. and 30 additional credits</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-years-old or younger</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Between 30-55 years-old</td>
<td>49</td>
<td>***</td>
</tr>
<tr>
<td>Older than 55</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td><strong>Subject area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math or science teacher</td>
<td>54</td>
<td>**</td>
</tr>
<tr>
<td>Non-math or science teacher</td>
<td>52</td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: Discrete time survival analyses that model the probability of turnover for the various teacher characteristics, while simultaneously controlling for other teacher characteristics and contextual factors, such as a school’s NYC borough location and its annual change in student enrollment. Please see the full report and Technical Documentation for detailed information about modeling procedures.

NOTES: Statistical significance key: ~ p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001

**Which school characteristics are associated with teacher turnover?**

Using a variety of publicly-available data, and controlling for various characteristics of teachers and larger, system-wide contextual factors, we examined whether turnover rates differed across various types of middle schools. Exhibit 4 depicts the percentage of middle school teachers who left their schools within three years across middle schools with different characteristics. As with the previous exhibit, the statistics presented in Exhibit 4 suggest that rates of turnover are similar across many different types of middle schools, with a few notable exceptions. For instance, smaller middle schools were associated with higher levels of turnover,
on average. Fifty-five percent of the teachers who entered smaller middle schools (i.e., schools with roughly 700 students) between 2002 and 2009 left these schools within three years. By comparison, schools that enrolled approximately twice as many students lost about 48% of similar teachers within the same time period.

**Exhibit 4**
Estimated percentage of middle school teachers who left their schools with within three years
By selected school characteristics

<table>
<thead>
<tr>
<th>School size&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>692 (25&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>55</td>
<td>***</td>
</tr>
<tr>
<td>1,122 (50&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>1,383 (75&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality Review score</th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underdeveloped</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Underdeveloped with proficient features</td>
<td>53</td>
<td>0.3544</td>
</tr>
<tr>
<td>Proficient</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of students in poverty&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>59 (25&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>71 (50&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>51</td>
<td>**</td>
</tr>
<tr>
<td>83 (75&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent Proficient or higher on NY math assessment&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 (25&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>49 (50&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>51</td>
<td>***</td>
</tr>
<tr>
<td>69 (75&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>49</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weighted school environment score from School Survey&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 (25&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>9.4 (50&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>49</td>
<td>***</td>
</tr>
<tr>
<td>11 (75&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teachers’ race and whether school had a relatively high proportion of White students&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Left within 3 years (%)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>White teacher, high proportion of White students</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>White teacher, not a high proportion of White students</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Black teacher, high proportion of White students</td>
<td>53</td>
<td>***</td>
</tr>
<tr>
<td>Black teacher, not a high proportion of White students</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Hispanic teacher, high proportion of White students</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Hispanic teacher, not a high proportion of White students</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>
Motivated by the work of Thomas Dee and others, we examined the relationship between turnover and the match between teachers’ and students’ racial/ethnic backgrounds. These analyses revealed that middle school teachers remained in their schools longer when their racial and ethnic characteristics matched those of a substantial proportion of the students in their schools. In the typical New York City middle school, roughly 16% of students are White and 84% are non-White. Thus, schools where more than 16% of students are White could be considered schools with a relatively high proportion of White students even though White students do not represent the predominant racial/ethnic category in the school.

As Exhibit 4 depicts, controlling for other factors, White teachers who were working in schools with a relatively large proportion of White students were associated with lower rates of turnover than were White teachers working in schools where White students did not comprise an uncharacteristically large proportion of the student body. Similarly, Black and Hispanic teachers who were working in schools that had a relatively large proportion of non-White students were associated with lower rates of turnover than were Black and Hispanic teachers who were working in schools that did not have an uncharacteristically large proportion of non-White students.

While not the focus of this portion of the study, the relationship between turnover and the contextual factors for which our analyses controlled, such as the borough in which a middle school was located, yielded patterns of turnover that future studies should investigate further. For instance, there were wide discrepancies in the percentage of middle school teachers who left schools across the five boroughs. Rates of turnover were highest in Manhattan, where 66% of the teachers who entered middle schools between 2002 and 2009 left within three years. By contrast, within the same period of time, 63% of similar teachers left middle schools in the Bronx, 54% left schools in Brooklyn, 49% left schools in Queens, and 35% left schools in Staten Island.

**Discussion and Next Steps**

The main objectives of this first component of our larger study of turnover are to address foundational questions related to New York City middle school teacher turnover and establish the context for the subsequent components of our larger study. Despite the study’s design being more suitable for raising, rather than answering, questions, several key findings stand out in their own right. First, more than half of the middle school teachers who entered their schools between 2002 and 2009 left within three years. Among those who left, nearly 60% left the New York City public school system altogether; less than 30% of those who moved to other schools within the system transferred to Grade 6-8 middle schools. The relatively small percentage of teachers who secured assignments in other Grade 6-8 schools suggests that few of
the vacancies created by departing teachers were filled by incoming teachers with recent experience in similar schools.

These rates of turnover are likely to make it challenging for middle school principals, and for the teachers who remain in their schools, to establish organizational norms and a shared vision for their schools’ teaching and learning environment. Turnover of this nature may require schools administrators to divert resources away from professional development in order to orient and support teachers who are new to their buildings, new to the New York City schools, or new to teaching. In addition, turnover may compromise the continuity of the relationships between middle school teachers and administrators, students, parents, and the staff at organizations that partner with middle schools. If middle schools are unstable and impersonal, students may find it even more challenging to manage the transitions into, through, and out of the middle grades – a time period characterized by numerous social and emotional developments. While descriptive analyses of this nature do not support causal inferences, we find associations between turnover and measurable and malleable characteristics of middle schools, such as school size and the aspects of schools environment measured by the School Survey (e.g., school safety). These findings suggest the possibility that practitioners and policymakers may be able to influence turnover by influencing these characteristics of middle schools.

The remaining components of this study will extend the findings presented here and address other important questions related to middle school teacher turnover. The study’s second component – a survey of teachers in 125 New York City middle schools – is being led by Dr. Aaron Pallas (Teachers College). The survey will identify middle school teachers’ career intentions and examine their impressions of various aspects of their work and worksite. When linked with our analyses of the rates and patterns of turnover, the survey data will help us understand the extent to which turnover reflects, for instance, teachers’ discontent, a desire to pursue teaching as a short-term career, or factors beyond teachers’ control. In addition, the data will allow us to conduct a more fine-grained investigation of the relationship between turnover and additional, malleable aspects of schools’ environments.

Dr. Jennifer Goldstein (Baruch College) is leading the study’s third and final component, which consists of case studies of four middle schools – two schools where rates of turnover have been historically high, and two where rates have been low – that serve similar, high-need student populations. These case studies will help us gain a better understanding of the extent to which teachers and school administrators perceive turnover as a cause or consequence of their schools’ operational functioning. Further the case studies will examine schools’ strategies for recruiting, developing and retaining effective teachers and for limiting turnover’s damaging consequences.

The Research Alliance also intends to extend the analyses presented here in order to offer further insight into the potential causes and consequences of the rates and patterns of turnover. In particular, we hope to examine the extent to which patterns of turnover are the result of teachers’ voluntary decisions, as opposed to involuntarily transactions initiated by administrators. Utilizing various sources of data about teachers’ effectiveness, we also intend to explore why effective middle school teachers leave their schools and whether particular incentives or changes to their working conditions appear to keep them in their schools.

To inform our broader research on the middle grades, we plan on gathering more and better evidence about whether middle school teachers are prepared, and whether their schools are organized, to support students’ academic, social and emotional development during this critical
phase of students’ schooling. This effort will entail conducting rigorous investigations on topics
that have not been adequately explored, such as whether particular school grade configurations
(e.g. 6-8, K-8, or 6-12 schools) are more suitable for sustaining and stimulating students’ growth
during the middle grades. Collectively, the findings from the three components of this study of
teacher turnover and from our future investigations will provide policymakers, practitioners, and
researchers with evidence that can inform their efforts to improve middle schools and middle
grades education – two features of the New York City public school system that many agree are
vital but imperiled.

attrition and student achievement. Paper presented at the Inaugural Conference of the Research Alliance for New
York City Schools.


December 17, 2010 from: http://www2.kapoleims.k12.hi.us/campuslife/depts/electives/dance/Putting%20Middle%20Grades%20Studensnts%20on%20the%20Graduation%20Path.%20%20%20Policy%20and%20Practice%20Brief.%20%202009.pdf

Balfanz, R., Herzog, L., & Mac Iver, D. J. (2007). Preventing student disengagement and keeping students on the
graduation path in the urban middle-grades schools: Early identification and effective interventions. Educational
Psychologist, 42(4), 223-235.


of the literature on teacher retention. Cambridge, MA: Harvard Graduate School of Education.


attrition and student achievement. Paper presented at the Inaugural Conference of the Research Alliance for New
York City Schools.

attrition and student achievement. Paper presented at the Inaugural Conference of the Research Alliance for New
York City Schools.

classroom: Are schools keeping their best?” National Center for Analysis of Longitudinal Data in Education
It should be noted these teachers were not necessarily first-year teachers, nor new to the New York City public school system.


Our analyses of the relationship between turnover and the characteristics of teachers and schools control for four factors that we hypothesized might affect turnover: 1) the school year during which teachers first entered their NYC middle school; 2) whether a school experienced one or several episodes of principal turnover during the period of observation; 3) a time-varying measure of the annual change in a school’s student enrollment; and 4) a school’s NYC borough location. In the full report, we refer to these variables as our *baseline covariates*. Our methodology controls for their effects in order to examine the relationships between turnover and the relevant teacher and school characteristics in our datasets.


About
The Research Alliance for New York City Schools

Mission

The Research Alliance for New York City Schools is a non-partisan research center that is committed to conducting, supporting, and disseminating rigorous research for and about New York City Schools. Our research and dissemination activities aim to support the search for effective school improvement strategies and to build capacity in schools to implement those strategies so that all young people have access to a high quality education.

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