

The **Research Alliance** for
New York City Schools

Navigating the Middle Grades: Evidence from New York City



Michael J. Kieffer
William H. Marinell

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NEW YORK UNIVERSITY

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Michael J. Keiffer
Teachers College, Columbia University

William H. Marinell
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CONTENTS

I. Overview	1
II. Analytic Approach	3
III. Data	4
IV. Findings	5
Who's on track to graduate and why?	5
What do students' grade four-eight achievement and attendance trajectories look like?	5
Does students' grade four-eight achievement predict who's on track in grade nine?	7
Does students' grade four-eight attendance predict who's on track in grade nine?	8
Do particular demographic groups of students demonstrate middle-grades trajectories that are associated with being off-track in grade nine?	12
Is middle grades performance equally predictive of later on-track status across ethnic and language groups?	17
Do these patterns hold across schools?	17
V. Exploratory Analyses	20
How do high-growth and low-growth schools compare?	20
VI. Conclusions & Implications	22
VII. Notes and References	23

I. OVERVIEW

Educators have long asserted that the middle grade years (typically, grades six through eight) are a time of both great importance and vulnerability in students' K-12 schooling. Anecdotal and empirical evidence suggest that students encounter new social and emotional challenges, increased academic demands, and major developmental transitions during the middle grade years.¹ These questions have gained more prominence in New York City as the new Chancellor, Dennis M. Walcott, has made middle school reform a central priority for current efforts.² Despite the academic and developmental challenges associated with the middle grades transition, we know very little about whether changes in students' achievement or attendance during this period can help us anticipate their progress toward graduation.

The Research Alliance for New York City Schools has been investigating these topics in New York City through collaboration with principal researcher Michael Kieffer (Teachers College, Columbia University). The study is motivated by an interest in learning more about whether and when students struggle during the transitions into, through, and out of the middle grades, how early in their schooling vulnerable students can be identified, and whether the challenge of supporting students in the middle grades is prevalent across different demographic groups and across schools. In this study, we investigated whether and how students' achievement and attendance change between grades four and eight and identified moments during this period when students' achievement and attendance suggest that they will struggle to graduate from high school within four years.

Our findings are as follows:

- We can identify students who will struggle to graduate after four years of high school quite early in their schooling. Students' grade four attendance rates and their scores on New York's grade four math and English language arts (ELA) assessments all help predict the likelihood that students will graduate after four years of high school. Students' performance on the grade four ELA and math assessments are particularly strong predictors of the likelihood that they will graduate on time.
- Despite these early grade four warning signs, it is also important to monitor students' progress through the middle grades, as students whose attendance and achievement decline during this time period are less likely to graduate after four years of high school. In other words, the middle grades are not "too late to fail": Even students who are performing reasonably well at the beginning of the middle grades can fall off-track during the middle grades, and these declines have consequences for students' progress towards graduation.

- More specifically, students whose attendance falls during the middle grades are particularly at risk for not being able to graduate after four years of high school. While most students attend school regularly until the spring of grade six, their attendance begins to decline after this point, and falls quite rapidly between grades seven and eight. Many of the students whose attendance declines during this final middle grades year are on a similarly troubling trajectory at the end of grade nine, one year later.
- While slightly less portentous than attendance, students' achievement during the middle grades also helps predicts which students will graduate after four years of high school. In particular, students whose math scores decline during the middle grades (relative to the scores of their peers) are particularly less likely to graduate after four years of high schools.
- These relationships are largely the same for students from different ethnic backgrounds and for English language learners. African-American, Native American, and Latino students are more likely than their White peers to demonstrate poor attendance and achievement during the middle grades, which in turn are associated with their lower probability of on-time graduation. English language learners demonstrate slightly better attendance but substantially lower achievement during the middle grades than their native English-speaking peers, whereas students who speak another language at home but are not designated as English language learners demonstrate consistently better attendance and achievement than native English speakers.
- These trends hold across schools in New York City. The vast majority of variation in students' middle grades performance is between students attending the same schools and exploratory analyses with selected school variables (e.g., student demographics, teacher experience) suggested that substantial overlap in middle grades performance across schools with different characteristics. These results suggest that all schools need to be concerned about identifying and supporting those students who fall behind during the middle grades.

These findings suggest that struggling students can be identified quite early in their schooling and that changes in students' achievement and attendance during the middle grades can help us anticipate which students will struggle during high school in their progress towards graduation. The findings also point to some evidence of students' resiliency in the middle grades, suggesting that interventions during the middle grades are not too late to prevent students from falling off-track in their progress towards graduation. In the remainder of this report, we describe our analytic approach and the data sets that we use in these analyses, then we describe our findings in more detail and raise questions for future research. Readers who are interested in even more detail about our analyses are referred to the technical appendix to this report.

II. ANALYTIC APPROACH

Previous research has demonstrated the importance of students' performance in grade nine in predicting the likelihood of their graduating after four years of high school, which we refer to throughout this report as graduating "on time."³ These findings have prompted urban schools systems, such as those in Chicago and NYC, to develop "on-track indicators," which identify vulnerable students in an attempt to help ensure that these students graduate on time and are prepared for post-secondary work or study. Following this precedent, our first set of analyses investigates the relationship between NYC students' performance in grade nine and the likelihood of their graduating after four years of high school. Based on this analysis, we create a high school on-track indicator (i.e., a composite of student performance measures in grade nine) that maximizes our ability to predict students' graduating on time. Subsequently, in our second set of analyses, we use this indicator as our new outcome, and we examine whether students' performance between grades four and eight predicts their grade-nine indicator scores and, thus, their probability of graduating on time. In our third set of analyses, we investigate whether these predictive relationships hold across student groups and school. In particular, we investigate whether these relationships are the same for students from different ethnic backgrounds and for English language learners compared to native English speakers. We further investigate what proportion of the variation in middle grades performance is between children in the same schools and what proportion is between different schools, with the intent of describing the extent to which the patterns we detect are similar across the variety of schools in NYC. We end by providing exploratory descriptive analyses of some school characteristics for schools with high, medium, and low rates of average growth in attendance and achievement.

III. DATA

These analyses draw on a number of student-level data files from the New York City Department of Education's (DOE) archive. We use the DOE's audited *J-Form Register* and *Longitudinal Cohort* files to identify first-time grade nine students and to monitor their progress through their high school graduation. The *NY State ELA and Math Test Score* file is the source of information on students' English language arts and mathematics test scores in grades four and eight, and the student-level *Regents* file contains information about whether students attempted and passed Regents exams in grade nine. We obtain information about students' grade nine course-taking, as well as the number of credits that they earned from these courses, from the *Course Detail Records* file, and information about attendance from the DOE's official attendance system. In all analyses, our target population is all students in New York City schools, including English language learners and students with disabilities.

For the first set of analyses, which predicts the probability of students graduating after four years of high school, we examine the progress of the cohort of students who were first-time ninth graders in the 2005-2006 school year. We begin with the 2005-2006 cohort because our data span the cohort's progress from grade four through high school, including the cohort's graduation in the spring of 2009. To examine whether the on-track indicators that we create for this cohort are robust across a different group of students, we conduct a series of parallel analyses for students who were first-time ninth graders during the 2000-2001 school year.

For the second and third set of analyses, which examines students' achievement and attendance patterns as they transition into and through the middle grades, we examine the progress of four cohorts of students who were first-time fourth graders between the 2000-2001 and 2003-2004 school years. Our data cover the former cohort's progress through high school graduation and the latter cohort's progress through grade nine. We focus this second set of analyses on the entire population of students who ever appear in these four cohorts ($N = 303,845$), although we also conducted additional analyses with the subset of students with complete data for the entire range of years and variables (see technical appendix). Results were largely the same for the entire population and the smaller subset.

IV. FINDINGS

Who's on track to graduate and why?

The preliminary results from our first set of analyses suggest that indicators of students' performance in grade nine are strong predictors of the likelihood that students will graduate after four years of high school. These grade-nine predictors include credits earned, courses failed, grade point average, attendance rate, whether a Regents exam was attempted, and whether a Regents exam was passed. These predictors remain strong when controlling for students' grade eight test scores in English language arts and mathematics and for "school effects" – in other words, the role that schools play in influencing students' performance. The single best predictor of students' graduating on time is the number of credits students earn in grade nine. For both of cohorts that we studied, students who earned 11 or more credits in grade nine (i.e., one-quarter of the 44 credits needed to graduate) had a predicted graduation rate of 83 percent or higher, whereas students earning eight or fewer credits had a predicted graduation rate of 20 percent or lower.

Using logistic regression to find the relative weights of each of the multiple predictors, we created a grade-nine "on-track" indicator that summarizes these predictive relationships into a single predicted probability of graduation for each student. The median predicted student graduation rate was 67 percent. Students with on-track indicator values in the top quartile had an average predicted graduation rate of about 92 percent, whereas those in the bottom quartile had an average predicted graduation rate of seven percent. Based on this analysis, we can also calculate the grade-nine indicator score for students who have yet to graduate, as long as we have their grade-nine performance, an approach that we use in the second set of analyses below.

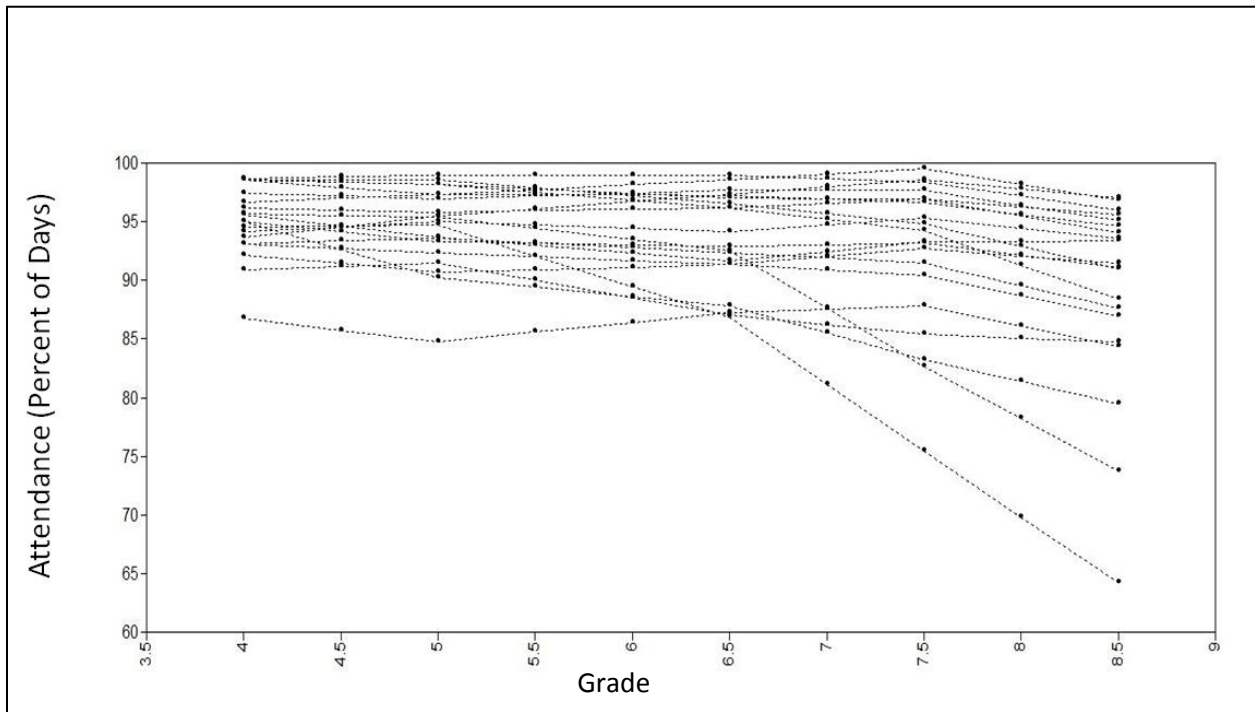
What do students' grade four-eight achievement and attendance trajectories look like?

In the second set of analyses, we describe how students' achievement and attendance fluctuate between grades four and eight. This description serves as the basis for our investigation of the extent to which students' performance during the middle grades predicts their grade-nine indicator score. Our preliminary results suggest that there is wide variation in both the levels of students' attendance and achievement and in the extent to which these levels change during the middle grades.

Attendance rates are generally high and stable across students from grades four through eight and then drop off steeply between grades seven and eight. Figure 1 illustrates this overall pattern by displaying growth trajectories in students' attendance between fall of grade four and spring of grade eight for 20 students that we chose at random from the dataset. As Figure 1 depicts, most of the students have high attendance rates (above 90 percent of the days enrolled) until the spring of grade six, when they begin to fall steeply. In addition, some students'

attendance rates fall much more dramatically than others during grades seven and eight. Moreover, students' past attendance is not helpful in predicting which students will fall behind most in the later periods. Students' grade four attendance does not correlate with their change in attendance in grade eight; in other words, the students who fell behind dramatically in grades seven and eight were equally likely to have high attendance as they were to have low attendance in earlier grades. The patterns that Figure 1 features also illustrate the general patterns across the entire dataset.

Figure 1:
Patterns of Change in Attendance between Fall Semester of Grade 4 and Spring Semester of Grade 8 for a Random Sample of 20 Students in New York City Schools



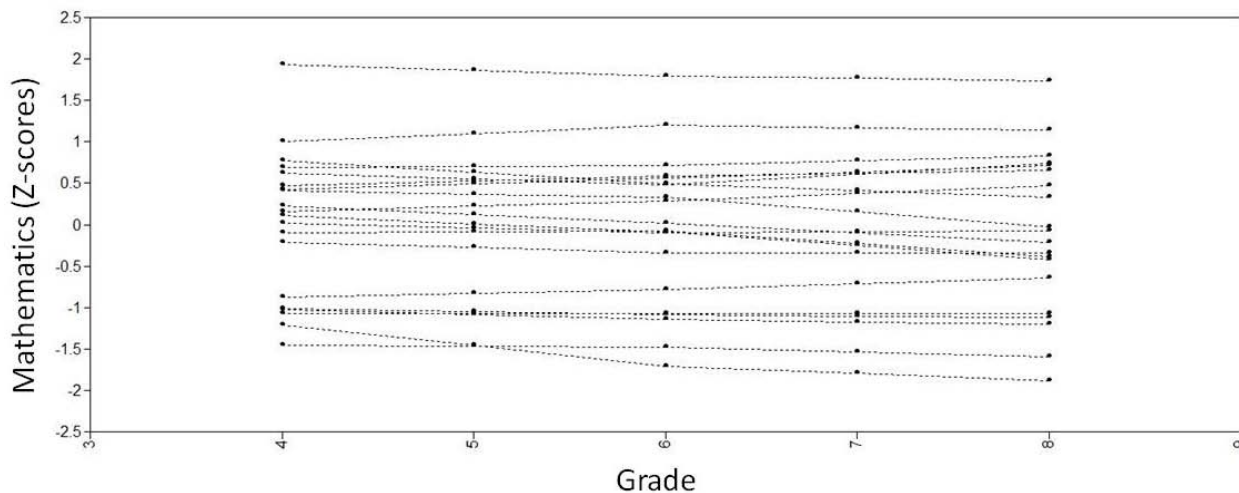
Note: Whole numbers indicate fall semester (e.g., 4 = fall of grade 4) while .5 indicates spring semester (e.g., 8.5 = spring of grade 8).

Students' achievement test scores are more stable than their attendance over time, with many students remaining at similar levels, relative to their peers, from grades four through eight. Figure 2 illustrates this general pattern by displaying the patterns of change in mathematics achievement for 20 students that we selected at random from the dataset. As shown, those students who have higher levels of achievement in grades four and six tend to be those who end up with higher achievement in grade eight, while only a few students move from above-average to below-average (or vice versa) over time. It is worth noting that these figures – like the analyses on which our overall findings are based – use z-scores, which categorize students'

performance relative to other students in the same grade and have an average of zero in each grade. Thus, the flat nature of the overall trend is a result of our choice of measure and does not indicate that the average student’s mathematics performance is stagnant over time. Although the overall trend depicts stability across students’ relative performance, a minority of students fall substantially behind the bulk of New York City students, while others catch up with or surpass their peers. These patterns are largely similar for mathematics and for English language arts.

Figure 2:

Patterns of Change in Students’ Relative Rank-order in Mathematics Achievement for a Random Sub-sample of 20 Students in New York City Schools



Does students’ grade four-eight achievement predict who’s on track in grade nine?

We find that students’ grade four achievement tells us a great deal about how they will perform in grade nine (i.e., predicts their grade-nine indicator score) and, thus, their likelihood of going on to graduate high school on time. However, changes in achievement during the middle grades also provide important information about how students will perform in grade nine.

In particular, changes in students’ math scores between grades six and eight are much more predictive of their grade-nine indicator score than are changes between grades four and six grade—highlighting the importance of students’ performance in math during the middle grades for their eventual graduation. For reading scores, changes between grades six and eight are equally as predictive of students’ grade-nine indicator score as are changes in students’ reading scores between grades four and six.

To illustrate these findings, Figure 3 displays achievement patterns and the associated on-track indicator scores for four hypothetical students with prototypical performance. The left panel displays trends in students’ achievement between grades four and eight. As shown, the

student trajectory displayed in blue starts at the NYC average in mathematics achievement in grade four and remains at the average level through grade eight; the student trajectory in green starts at the NYC average but falls substantially behind in grades seven and eight (i.e., has a slope that is 1 SD below the sample mean slope);⁴ the student trajectory in red starts substantially below-average in grade four⁵ (i.e., with an initial level that is one SD below the sample mean) but maintains this level; and the student trajectory in purple starts substantially below-average in grade four (i.e., one SD below the mean) but falls even further behind (i.e., with a slope that is one SD below the mean slope). Given the relationships we find above, these differences in achievement patterns predict major differences in students' grade-nine on-track indicator score and thus their probability of graduating on time. The right panel of Figure 3 displays the percent chance of being on-track for graduation for these same four prototypical students. As shown, only the student trajectory in blue is associated with a greater than 50 percent chance of later graduation. Most notably, a student who starts at an average level but falls behind during the middle grades (i.e., the student represented in green) has a less than 50 percent of graduating on time, which is only marginally better than a student who starts behind in grade four (i.e., the student represented in red). We found similar patterns, though to a somewhat lesser degree, for reading achievement.

Does students' grade four-eight attendance predict who's on track in grade nine?

As with our analyses of students' achievement, students' grade four attendance is an important predictor of whether students are on-track to graduate by the end of grade nine. Further, we find that students' attendance during the middle grades may be an even more important source of information about their later success than their test scores.

To illustrate these findings, Figure 4 displays attendance growth patterns and associated on-track indicator scores for four prototypical students. As the left panel shows, the blue and green trajectories both represent students who start with average attendance in grade four (i.e., attendance rates of roughly 94 percent); while the blue trajectory represents a student who maintains this level, the green trajectory represents a student who falls behind sharply in attendance in grades seven and eighth (i.e., missing an additional 9 percent of days each year). This later drop represents a slope that is 1 SD below the sample mean. Similarly, the red and purple trajectories represent students who start with below-average attendance (i.e., attendance rates of roughly 87 percent or one SD below the mean); while the red trajectory represents a student who maintains this (relatively low) level, the purple trajectory represents a student who falls even further below (i.e., with a slope one SD below the sample mean). Our findings indicate that these differences in attendance patterns predict differences in students' on-track indicator score and thus their chances of going on to graduate on time. As the right panel shows, a student who falls behind in the middle grades (i.e., the green trajectory) has only a 57 percent chance of going on to graduate, compared to the 75 percent chance for a student who maintains an average level of attendance. A student with a consistently low level of attendance (i.e., the red trajectory)

has only a 43 percent chance of graduating, while a student who low attendance in grade four who falls even further in grades seven and eight has only a 25 percent chance of going on to graduate.

Figure 3:

Fitted Trajectories for Four Prototypical Students with Average or Below-average Levels and Rates of Growth in Mathematics Achievement (Left Panel) with their Predicted Ninth-grade On-track Indicator Score, i.e., Percent Chance of Being On-track for Later Graduation (N = 303,845)

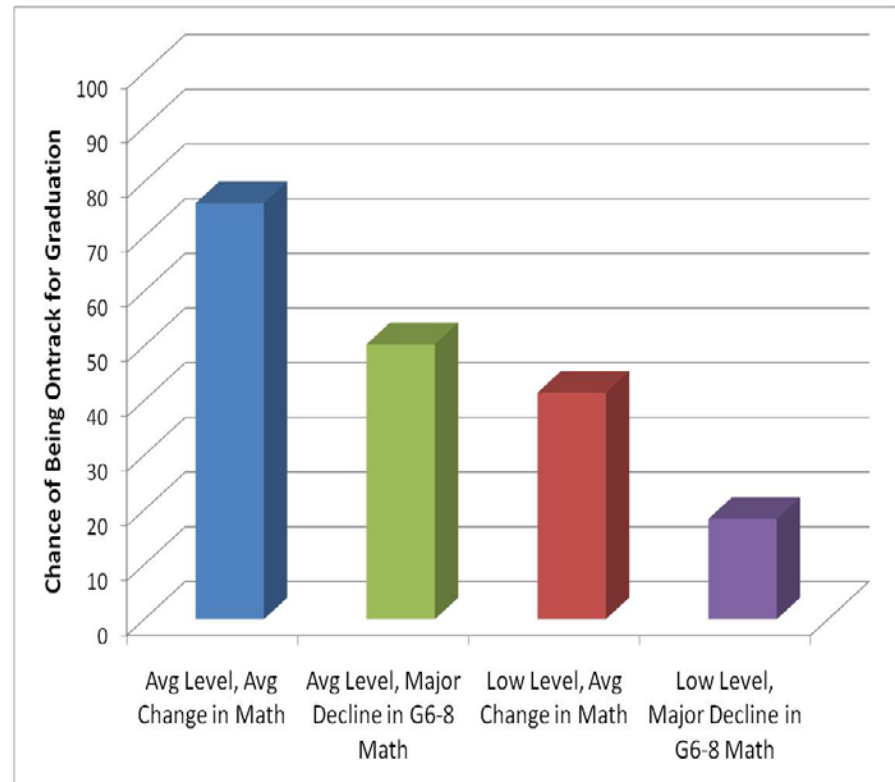
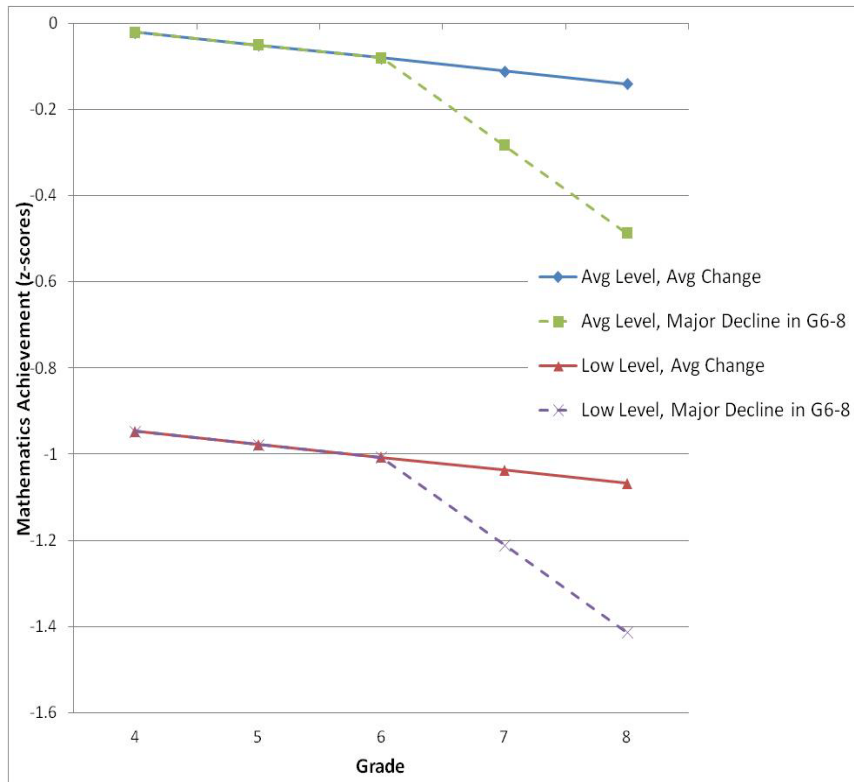
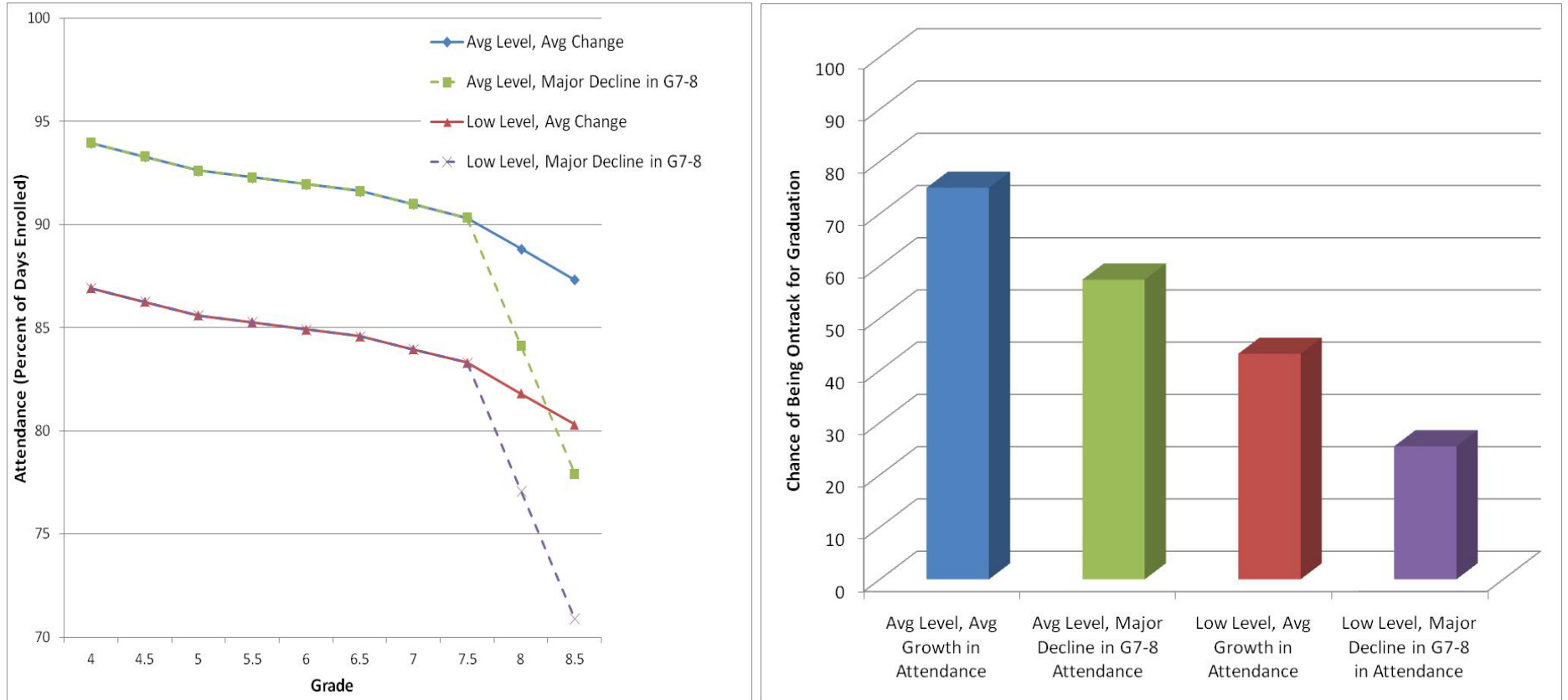


Figure 4:

Fitted Growth Trajectories in Attendance for Four Prototypical Students between Fourth and Eighth Grade (Left Panel) with their Predicted Ninth-grade On-track Indicator Score, i.e., Percent Chance of Being On-track for Later Graduation (N = 303,845)



Do particular demographic groups of students demonstrate middle-grades trajectories that are associated with being off-track in grade nine?

We find that Latino students, African-American students, and English language learners, on average, have lower attendance rates and achievement scores in the middle grades, as we might expect from other research.⁶ For attendance, gaps between African-American and Latino students and their White and Asian counterparts begin in grade four, but grow most substantially between spring of grade six and spring of grade seven, as shown in Figure 5. Achievement test score gaps are large in grade four and remain so through grade eight, as shown in Figures 6 and 7.

Figure 5:
Attendance Growth Trajectories Fitted by Ethnicity

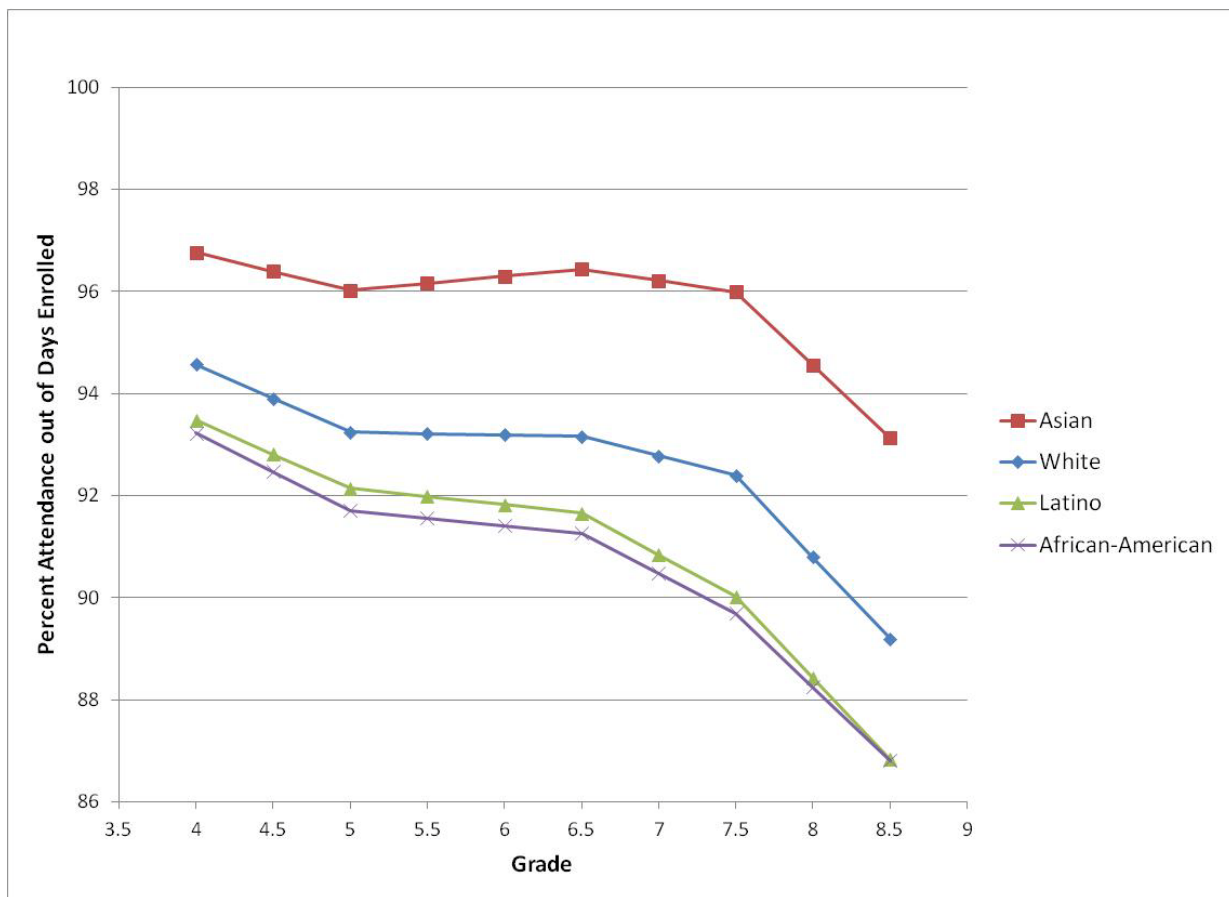


Figure 6:

Mathematics Achievement Test Scores Fitted by Ethnicity

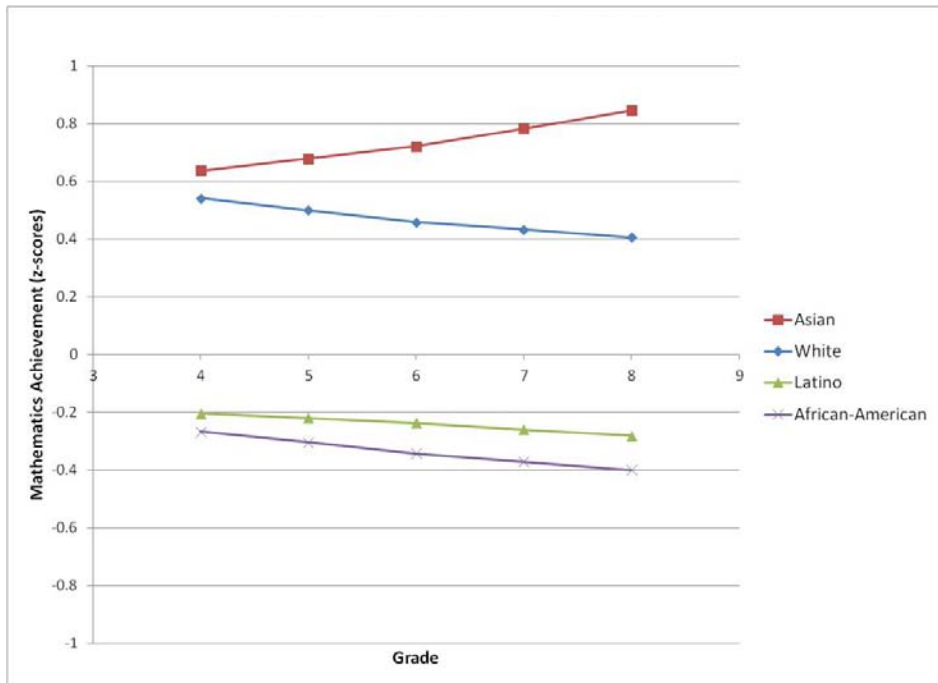
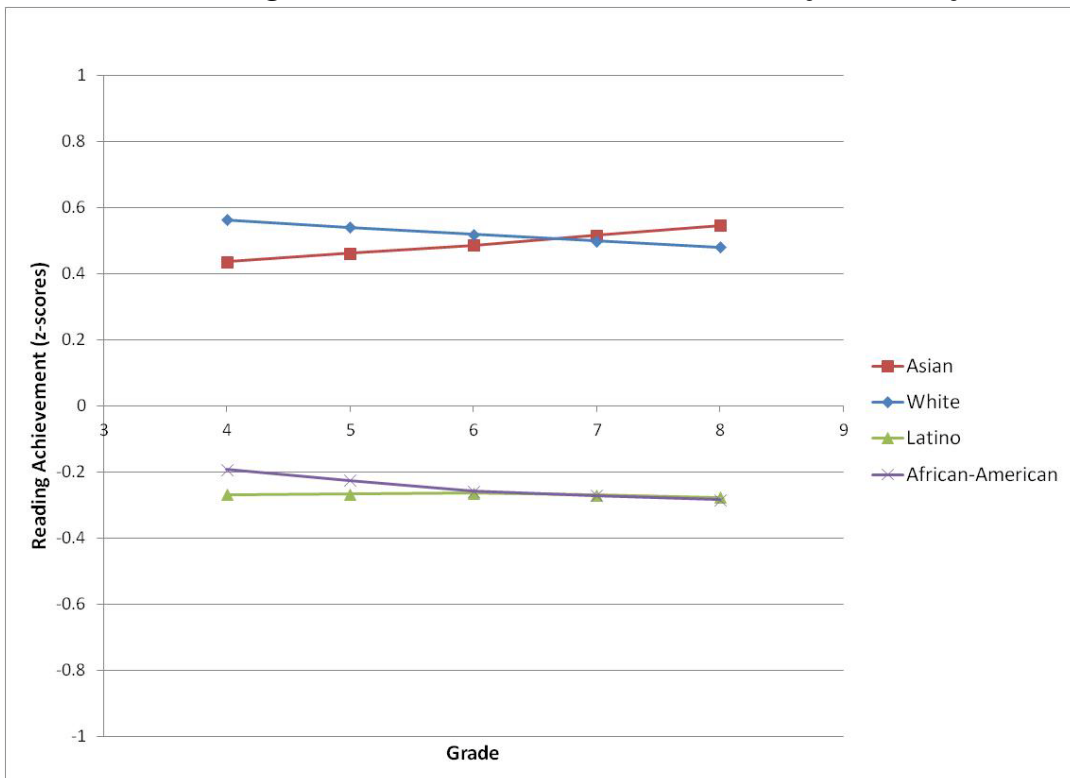


Figure 7:

Reading Achievement Test Scores Fitted by Ethnicity



These differences in middle grade performance by ethnic group are associated with substantially higher levels of risk for being off-track in grade nine for later high school graduation. For instance, students with middle-grade attendance and achievement at the average levels for White students have grade-nine on-track probabilities near .88, suggesting a high chance of going on to graduate, whereas students with middle-grade attendance and achievement at the average levels for Latino and African-American students have grade-nine on-track probabilities of .69 and .66, respectively indicating substantially lower probability of going on to graduate. It is worth noting that actual graduation rates are lower for all students and particularly for Latino and African-American students, in part because other factors beyond middle grades performance contribute to graduation.

Students designated as English language learners when they enter grade four have mixed performance, with slightly higher attendance rates but much lower achievement, compared to their peers from native English-speaking backgrounds. Figure 8 displays attendance rates for three groups of students: native English speakers; students designated as English language learners in grade four; and language minority learners (i.e., students from homes in which English is not the primary language) who are not designated as English language learners. As shown in Figure 8, English language learners have consistently, if only slightly (approximately one percent) higher attendance rates across the middle grades, compared to native English speakers. Large and persistent achievement test score differences were also found between students designated as English language learners and native English speakers for both mathematics (Figure 9) and reading (Figure 10), though there is some evidence that English language learners narrow achievement gaps over time, as shown by the narrowing of the gap between the green and blue lines in the Figures 9 and 10. These differences in middle grade performance by language background are associated substantial differences in students' probability of being on-track in grade nine. For instance, English language learners have an on-track probability of approximately .62, compared to probabilities of .72 for native English speakers and .85 for language minority learners who are not designated as English language learners.

In contrast, language minority learners who were not designated as English language learners in grade four have consistently better attendance rates and consistently higher achievement compared to native English speakers. This is consistent with research that suggests that language minority status, in and of itself, is not a substantial risk factor, that bilingualism can be a benefit.⁷

Figure 8:
Attendance Rates by English Language Learner and Language Minority Status

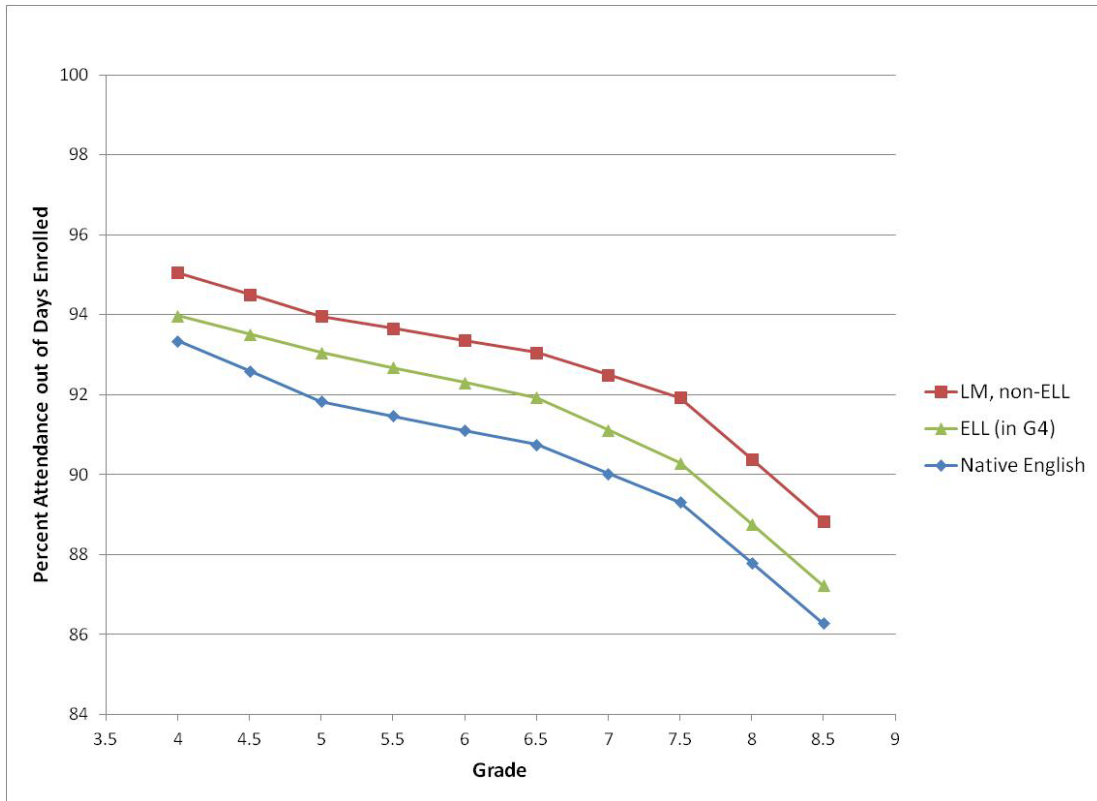


Figure 9:

Mathematics Achievement over Time by English Language Learner and Language Minority Status

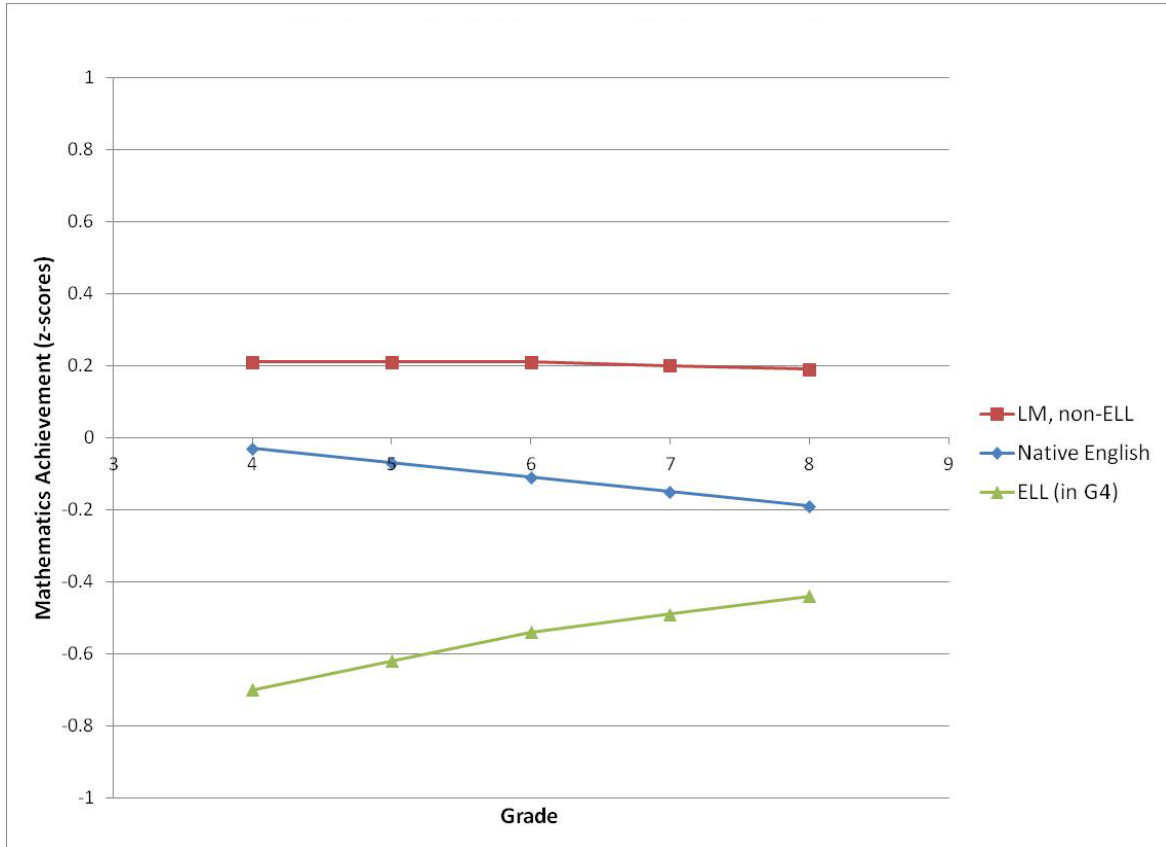
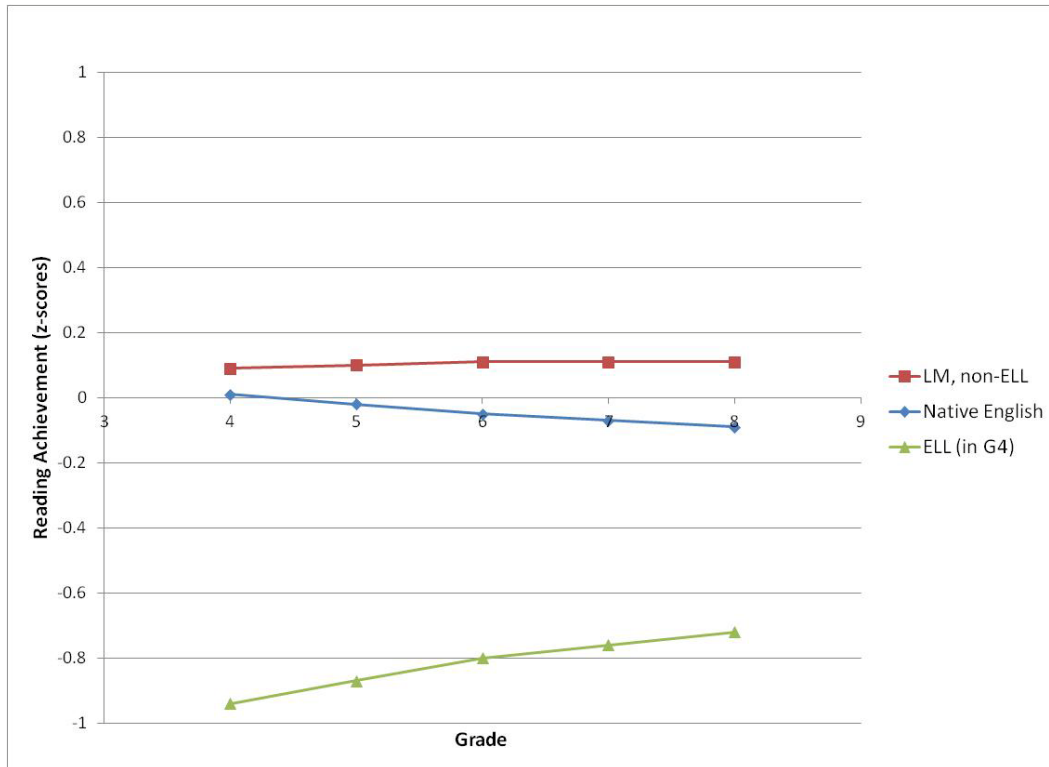


Figure 10:

Reading Achievement over Time by English Language Learner and Language Minority Status



Is middle grades performance equally predictive of later on-track status across ethnic and language groups?

In addition to investigating whether ethnic and language groups have differing levels of middle grades performance, we also investigated whether the predictive relationships found between middle grades performance and later on-track status held across ethnic and language groups. We found that largely the same pattern of predictions held across groups. For each ethnic group, attendance levels and changes during the middle grades were robustly associated with on-track status in grade nine. Similarly, for each ethnic group, achievement levels and change during the middle grades were strongly associated with on-track status in grade nine (see Technical Appendix). Across groups, the overall pattern held, indicating that middle grades performance matters for all ethnic and language groups.

Do these patterns hold across schools?

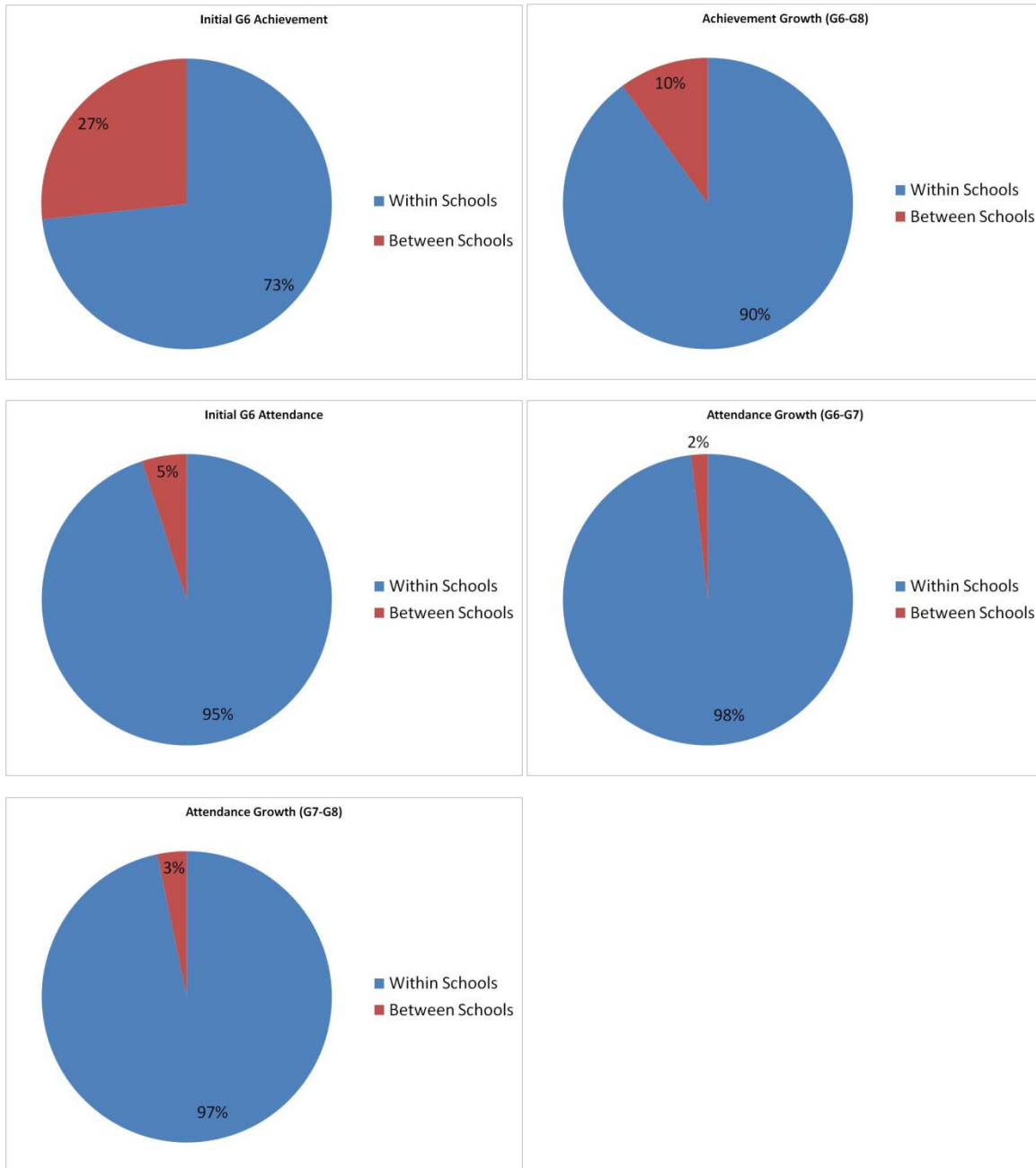
We conducted analyses to investigate whether students' levels and changes in attendance and achievement were associated with the schools that they attend. Specifically, we conducted analyses that allow us to partition the variation in performance into the portion that is associated

with differences between students attending the same school (within-school variation) and the portion that is associated with differences between students attending different schools (between-school variation). We partition this variation for both levels and rates of change for both achievement and attendance. We found that for both attendance and achievement, that vast majority of variation is associated with individual differences between students attending the same schools rather than due to differences between schools. In particular, the changes in attendance and achievement that we have noted and have found to be associated with later on-track status appear to vary across students within schools. This suggests that some students in nearly every school serving the middle grades in NYC are declining substantially in achievement and attendance and that some students in nearly every school are maintaining or improving in achievement and attendance. Figure 11 displays the proportion of variation that is within-schools and between-schools for achievement and attendance levels (in grade six) and change (between grade six and grade eight).

The importance of individual differences between students within the same schools holds particularly true for attendance. Only two percent to five percent of variation in attendance is associated with differences between schools. For achievement, a more substantial proportion of the variation in grade six level (27 percent) is associated with differences between schools; however, a much smaller proportion of variation in students' changes in achievement between sixth and eighth grade (10 percent) is associated with differences between schools. Together, these findings suggest that the problem of students falling behind in attendance and achievement in the middle grades is not isolated to specific schools, but is a relatively universal phenomenon across schools in NYC. It also suggests that all schools have some students who are maintaining or recovering success in the middle grades.

Figure 11:

Proportion of Variance that is Associated with Differences between Students within Schools (in Blue) and between Different Schools (in Red) for Achievement and Attendance Levels and Slopes



V. EXPLORATORY ANALYSES

How do high-growth and low-growth schools compare?

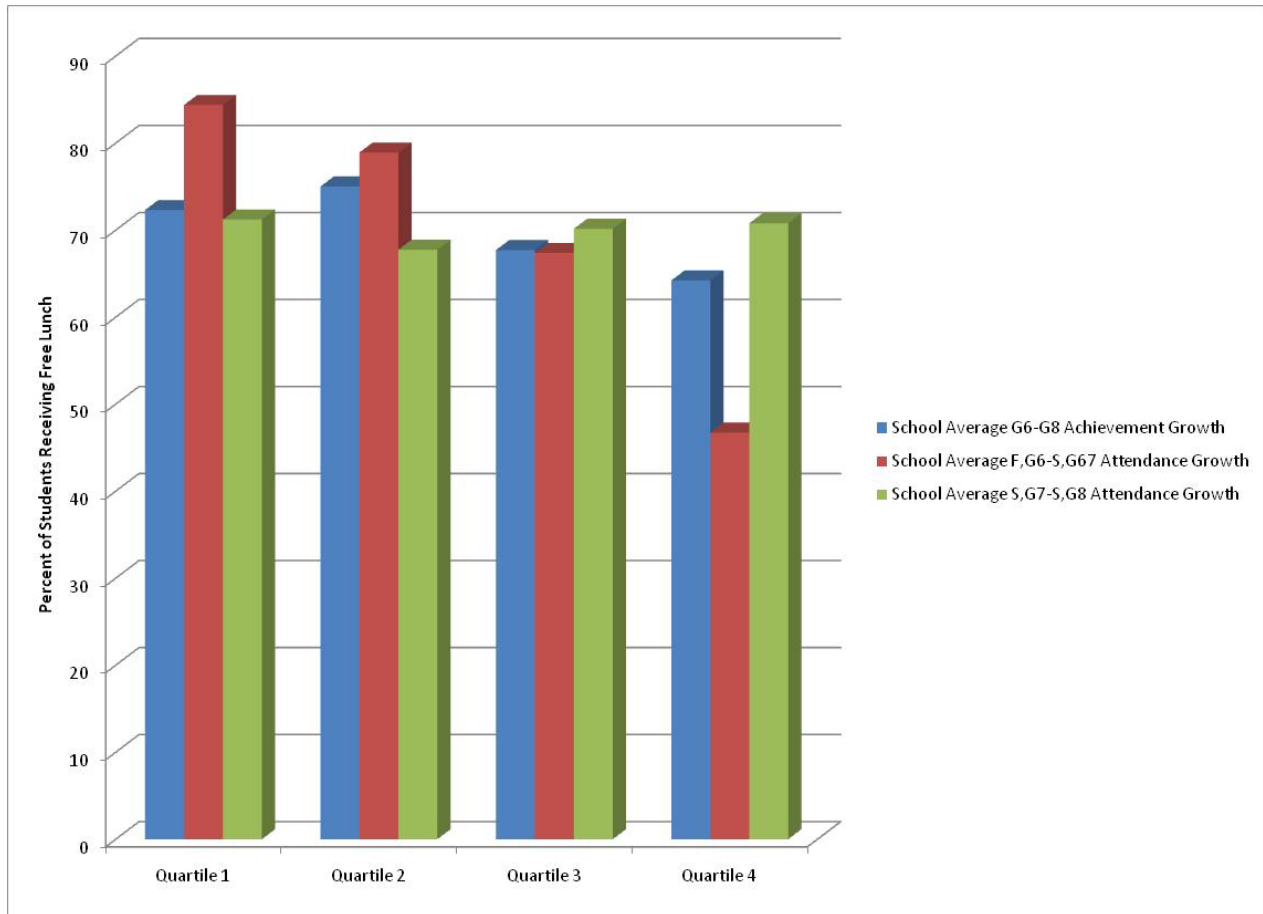
To provide additional insight into how these patterns differ across schools, we conducted an exploratory analysis involving selected publically-available variables for school characteristics. Specifically, we identified which school students attended in grade six, then categorized schools based on their average estimated achievement and attendance growth into four quartiles. We next estimated the mean values for selected school characteristics for each quartile. Such an analysis has the value of looking beyond schools' average levels of achievement and attendance to instead explore schools' average rates of growth in achievement and attendance.

These analyses suggested that the associations with demographic characteristics found for the student level (described above) largely hold at the school level as well (see technical appendix for details). For instance, schools which demonstrated higher rates of growth in attendance during the middle grades tended to have fewer African-American and Latino students. In addition, we found that schools with higher levels of growth in achievement and attendance tended to have much fewer students receiving free lunch, compared with schools with lower levels of growth in achievement and attendance. As shown in Figure 12, schools in the first quartile, whether the quartile was based on achievement or attendance growth, had much higher percentages of students receiving free lunch than schools in the fourth quartile.

We also conducted exploratory analyses with teacher characteristics, including variables for teachers' years of experience and the percent of core classes taught by "highly qualified" teachers (as defined by No Child Left Behind). However, these variables appeared to be relatively unrelated to school averages for achievement and attendance growth (see technical appendix). Schools classified as high-growth had similar proportions of relatively new and of more experienced teachers, compared to schools classified as low-growth, and this held whether the classification was based on achievement growth or attendance growth.

Figure 12:

Percent of Students Receiving Free Lunch for Schools, by Quartile based on School-average Achievement Growth between Grade 6 and 8, School-average Attendance Growth between Fall, Grade 6 and Spring, Grade 7, and School-average Attendance Growth between Spring 7 and Spring, Grade 8



VI. CONCLUSIONS & IMPLICATIONS

Together, these results suggest several important discoveries. First, we have confirmed earlier research conducted in other contexts by finding that ninth grade performance provides strong information about whether students in NYC go on to graduate on time. Second, echoing research on the importance of early learning,⁸ we find that NYC students' attendance and achievement towards the end of the elementary grades tell us a lot about the likelihood that they will be on-track to graduate at the start of high school. Third, however, we find that the middle grades may not be too late to prevent declining attendance and stagnant achievement, given that changes during these years (not just prior levels in grade four) are predictive of students' later success. Fourth, we found that these patterns largely hold across students of differing ethnic and language backgrounds and that students' middle grade performance may explain much of the attainment gap in high school graduation. Fifth, we found that these patterns hold consistently across schools, such that little of the variation in attendance and achievement growth is associated with differences between schools. Sixth, we found that the aggregated demographic characteristics of schools, including concentration of students receiving free lunch, did appear to differentiate between schools in which students demonstrated more and less positive growth in attendance and achievement, but that teacher characteristics did not appear to differentiate between these schools.

These findings suggest that initiatives to prevent declines in students' attendance and achievement in the middle grades may well help accomplish their intended objectives. Our preliminary findings also suggest that focusing on students' achievement alone may be misguided. While relative improvements or declines in students' test scores are predictive of students' progress towards graduation, changes in attendance during the middle grades are also equally, if not more, predictive of the likelihood that students will be on-track in grade nine to graduate from high school within four years. In finding similar relationships across demographic groups and across schools, these results suggest that attention to middle grades performance should cut across settings and groups. In light of Chancellor Walcott's call for middle school reform, these findings suggest that such attention to the middle grades is warranted, although they cannot speak to the efficacy of particular strategies for such reform.

These analyses also raise questions for future research. Most pressing for NYC educators, there are many open questions about how to intervene in the middle grades to promote positive trajectories in achievement and attendance. In that this analysis found relatively little existing variation between schools in these variables, such interventions may need to look beyond what is currently happening in New York City schools. In addition, such interventions will likely need to address gaps in achievement and attendance within schools of various kinds and configurations.

VII. NOTES AND REFERENCES

- ¹ Eccles, J. (fall, 1999). The Development of Children Ages 6 to 14. *The Future of Children: When school is out*, 9(2). Retrieved on February 17, 2011 from http://www.futureofchildren.org/futureofchildren/publications/docs/09_02_02.pdf
- Eccles, J., Midgley, C., & Adler, T. F. (1984). Grade-related changes in the school environment: Effects on achievement motivation. In J. G. Nicholls (Ed.) *The development of achievement motivation* (pp. 283-331). Greenwich, CT: JAI Press.
- National Middle School Association. (1995). *This we believe: Developmentally responsive middle schools*. Columbus, OH: Author.
- Seidman, E., Aber, J. L., & French, S. E. (2004). The organization of schooling and adolescent development. In K. Maton, C. Schellenbach, B. Leadbeater, & A. Solarz (Eds.), *Investing in children, youth, families, and communities: Strengths-based research and policy* (pp. 233-250). Washington, DC: American Psychological Association.
- ² New York City Department of Education. In major policy address, Chancellor Dennis M. Walcott calls middle schools “ripe for opportunity,” lays out a bold strategy for success. News Release. Retrieved February 2, 2012 from <http://schools.nyc.gov/Offices/mediarelations/NewsandSpeeches/2011-2012/msspeechatnyu92011.htm>
- ³ Allensworth, E. M., & Easton, J. Q. (2007). What matters for staying on-track and graduating in Chicago Public High Schools: A close look at course grades, failures, and attendance in freshman year. Retrieved on February 17, 2011 from <http://ccsr.uchicago.edu/publications/07%20What%20Matters%20Final.pdf>
- ⁴ For all of these prototypical cases, a “major decline” is defined as one standard deviation below the sample mean for true rate of growth. For mathematics achievement during the sixth to eighth grade period, this is equivalent to approximately .2 z-score points.
- ⁵ By substantially below average, we mean one standard deviation below the sample mean in true scores for fourth grade status. For mathematics achievement, this standard deviation is equivalent to approximately .92 z-score points.
- ⁶ National Center for Educational Statistics (2009). *Nation’s Report Card*. Washington, DC: U.S. Department of education.
- ⁷ E.g., Kieffer, M. J. (2011). Converging trajectories: Reading growth in language minority learners and their classmates, kindergarten to Grade 8. *American Educational Research Journal*, 48, 1157-1186.
- ⁸ Balfanz, R. (2009). *Putting middle grades students on the graduation path: A policy and practice brief*. Retrieved on December 17, 2010 from: <http://www2.kapoleims.k12.hi.us/campuslife/depts/electives/dance/Putting%20Middle%20Grades%20Studesnts%20on%20the%20Graduation%20Path.%20%20A%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.

The **Research Alliance** for
New York City Schools

285 Mercer Street, 3rd Floor | New York, New York 10003-9502

212 992 7697 | 212 995 4910 fax

research.alliance@nyu.edu | www.steinhardt.nyu.edu/research_alliance

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