FINDINGS: DO HIGH FLYERS MAINTAIN THEIR ALTITUDE?

What are the odds that a star third grader will still rank at the top of the pack by eighth grade? Or that a bright, budding sixth grader will remain a model student in high school? To find out, this analysis traced high-achieving students across multiple years to determine how many of them remained high-achieving over time; how many lost their high-achieving status; and how many gained that distinction. Students were sorted into the following categories:

- **Steady High Flyers:** Students who were high-achieving in both the initial and final years of the study (i.e., third and eighth grades for elementary/middle school students, sixth and tenth grades for middle/high school students)
- **Descenders:** Students who were high-achieving in the initial, but not the final, year
- **Late Bloomers:** Students who were high-achieving in the final, but not the initial, year
- **Never High Flyers:** Students who were not high achievers in the initial or the final year

FINDING #1 A majority of high flyers maintained their status over time, but substantial numbers "lost altitude."

As shown in Figure 1, a majority of high achievers remained that way over time, earning them the designation "Steady High Flyers." **Nearly three in five students identified as high-achieving in the initial year of the study remained high-achieving in the final year**. That is, 57.3 percent of high-achieving third-grade math students remained that way by eighth grade, while 55.9 percent did so in reading. A full 69.9 percent of high-achieving sixth-grade math students remained high-achieving by tenth grade; 52.4 percent did so in reading. The converse of these students, of course, are the 30 to 50 percent of initially high-achieving students that proved unstable and lost that status over time—earning them the designation of "Descenders."[7]

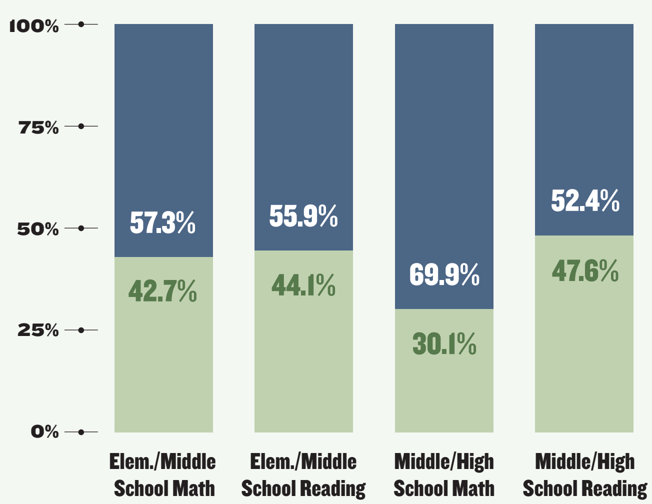


FIGURE 1

Outcomes of Initial High Flyers

Steady High Flyers | Descenders

Note: For each cohort and subject, the figure shows what percentage of the initial high achievers was still high-achieving in the final year of the study (Steady High Flyers), and what percentage was not (Descenders). Students were tracked from grades three to eight in elementary/middle school and grades six to ten in middle/high school. For example, 57.3 percent of the initial high math achievers in the elementary/middle school cohort remained high-achieving from third to eighth grade (i.e., they were Steady High Flyers), while 42.7 percent were no longer high-achieving by eighth grade (i.e., they were Descenders).

7 The rate of attrition is somewhat related to measurement error; for more information, see Appendix I.

Though substantial proportions of the high achievers lost that status over time, that isn't to say that the pool of high-achieving students shrank; on the contrary, it grew (Table 2), thanks to students ascending into the high-achieving ranks.[8] The percentage of high flyers in math at the elementary/middle level, for instance, grew from 12.4 percent of all students in third grade to 14.1 percent in eighth grade.

TABLE 2

High Achievers in Initial and Final Years

	Total Number of Students in Cohort	Number of High Flyers in Initial Year	Percentage of High Flyers in Initial Year	Number of High Flyers in Final Year	Percentage of High Flyers in Final Year	Change in High-Flyer Percentage
ELEMENTARY/MIDDLE SCHOOL COHORT						
Math	81,767	10,116	12.4%	11,544	14.1%	+1.7%
Reading	93,182	10,925	11.7%	12,429	13.3%	+1.6%
MIDDLE/HIGH SCHOOL COHORT						
Math	43,423	2,912	6.7%	4,779	11.0%	+4.3%
Reading	48,220	4,394	9.1%	4,677	9.7%	+0.6%

These increases were fueled by greater numbers of Late Bloomers entering the high-achieving ranks (Table 3). Within the full elementary/middle school cohort, 5.3 percent of students in math were Descenders, while 7.0 percent proved to be Late Bloomers. In reading, 5.2 percent of those students were Descenders, while 6.8 percent proved to be Late Bloomers. In the full middle/high school cohort, 2.0 percent of students in math were Descenders, compared with 6.3 percent who were Late Bloomers. In reading, 4.3 percent of students were Descenders, while 4.9 percent of students were Late Bloomers.

TABLE 3

Migration of High Achievers

	Total Number of Students in Cohort	Number of Descenders	Percentage of Descenders	Number of Late Bloomers	Percentage of Late Bloomers
ELEMENTARY/MIDDLE SCHOOL COHORT					
Math	81,767	4,317	5.3%	5,745	7.0%
Reading	93,182	4,817	5.2%	6,321	6.8%
MIDDLE/HIGH SCHOOL COHORT					
Math	43,423	878	2.0%	2,745	6.3%
Reading	48,220	2,090	4.3%	2,373	4.9%

8 Given that "high-achieving" status is defined as those students performing at or above the 90th normed percentile, one might assume that the Descenders' loss is the Late Bloomers' gain; that is, that the Late Bloomers simply assume the other group's place in the academic pecking order. Yet, there is no such thing as a "zero-sum game" here since the norm population is independent of the study population. See footnote 4 and/or Appendix I for additional discussion.

FINDING #2 The majority of students who attained high-flyer status at one point in time did not stray far from it.

While the Descenders fell below the 90th percentile by eighth or tenth grades, most did not fall far below. Take, for instance, those students who were high-performing in third-grade math but not in eighth-grade math. On average, those students still performed at the 77th percentile by eighth grade (Figure 2). Put another way, those students dropped from the top 10 percent of their grade to the top 30 percent. Late Bloomers also did not typically have far to climb to become high math achievers by eighth grade—on average, those students performed at the 74th percentile in third-grade math. (Results were similar for elementary/middle school reading and middle/high school math and reading.[9]) So while the

WHICH STUDENTS WERE MOST LIKELY TO REMAIN HIGH FLYERS?

Nearly half of high flyers lost their altitude over time, and many students who were not originally high flyers eventually earned that designation. This volatility in the high-achieving group invites the question: Which students fell, and which students rose? Are they distinguishable by race, gender, or school-level poverty? Findings are summarized below. Data can be found in Tables A-4 and A-5 on pages 19-20.

Minority status: While minority students were underrepresented among high achievers at both the elementary/middle and middle/high school levels, the proportions of minority students within the high-achieving groups proved relatively stable and, in most cases, increased slightly over time.[1] Elementary/middle school math was the only subject in which minority representation *didn't* increase: Minorities represented 8.2 percent of high flyers in both third and eighth grades in that subject. In reading, however, minorities grew from 9.0 percent of third-grade high flyers to 9.4 percent in eighth grade. In middle/high school, minority students grew from 7.3 percent of high flyers in sixth-grade math to 7.8 percent in tenth grade, and from 6.7 percent in reading to 7.3 percent.

Gender: Girls were underrepresented among high achievers in math and were slightly overrepresented among high achievers in reading; still, their proportions in both subjects grew over time.[2] In elementary/middle school math, girls rose from 41.9 to 44.0 percent of all high flyers from third grade to eighth grade, and in reading from 51.7 to 53.0 percent of high flyers. In the middle/high school cohort, the proportion of female high flyers grew from 39.0 to 41.7 percent in math, and from 49.8 to 52.6 percent in reading. Though girls remained underrepresented in math, the increasing proportions of girls in both subjects rendered the relative decline of boys among the top-performing portion of American students increasingly apparent.

School poverty: Students in high-poverty schools were predictably underrepresented among high flyers, but unlike minority and female students, their proportions declined over time.[3] In third-grade math, 19.4 percent of high achievers attended high-poverty schools; that fell to 16.1 percent by eighth grade. In elementary/middle school reading, the proportion fell slightly from 13.5 to 13.4 percent. In the middle/high school cohort, students in high poverty schools accounted for 18.1 percent of high achievers in sixth-grade math; they totaled 15.3 percent by tenth grade. In reading, they declined from 16.6 to 14.7 percent from sixth grade to tenth grade.

1 Minority students were defined as children from traditionally disadvantaged ethnic groups and included African American, Hispanic, and Native American students. Non-minority students included Anglo and Asian students. Of the total study sample, approximately 23 percent of students were minority, while 77 percent were non-minority.

2 The total study sample consisted of relatively equal proportions of girls (49.6 percent) and boys (50.4 percent).

3 Low poverty was defined as schools in which less than 50 percent of students received free or reduced-price lunch, while high poverty refers to a school in which more than 50 percent did so. In the study sample, 31 percent of students attended high-poverty schools, and 69 percent attended low-poverty schools.

9 For figures depicting results of these additional cohorts and subjects, see the Thomas B. Fordham Institute website at http://www.edexcellence.net/publications-issues/publications/high-flyers.html and the Kingsbury Center Data Gallery at http://kingsburycenter.org/gallery/high-achievers.

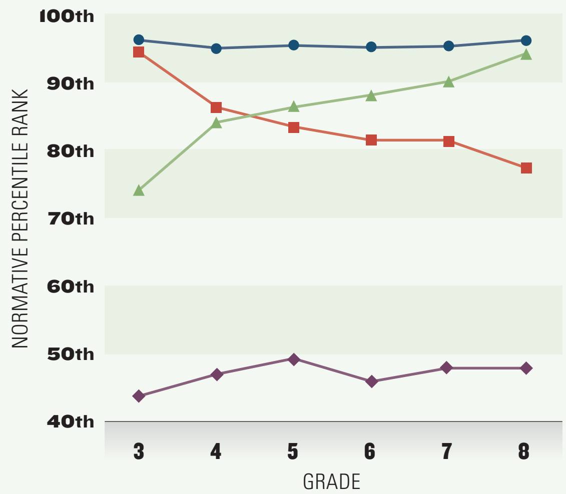


FIGURE 2

Migration Patterns by High-Flyer Status (Elementary/Middle School Math)

● Steady High Flyers ■ Descenders ▲ Late Bloomers ◆ Never High Flyers

Note: The figure shows the mean achievement percentiles in math for four groups of students at each grade. For example, between third and eighth grades, Steady High Flyers consistently ranked near the 95th percentile in math; Descenders dropped from around the 94th to the 77th percentile; Late Bloomers rose from the 74th to the 94th percentile; and Never High Flyers wavered between the 43rd and the 49th percentile.

pool of high achievers did experience turnover, **migration in and out of high-achieving status was concentrated among students performing above the 70th percentile.**

Descenders showed gradual movement away from the 90th percentile over time while Late Bloomers showed similarly gradual progress toward this benchmark—unsurprising findings, considering how these groups were defined. As Figure 2 shows, the biggest movements occurred between third and fourth grades and between seventh and eighth grades. While explaining these developments is beyond the scope of this study, a portion of the large drop between third and fourth grades is likely attributable to some measurement error (see Appendix I for further discussion).

The achievement of Descenders and Late Bloomers is explored more thoroughly in Figures 3 and 4. Figure 3 illustrates the full range of achievement of the Descenders in eighth-grade math. While these students no longer performed at or above the 90th percentile, as they did in third grade, the vast majority still performed near it. Only a small percentage of these students performed below the 50th percentile—meaning that the vast majority of initial high achievers remained above average throughout their school years.

Similarly, Figure 4 illustrates the full range of achievement of Late Bloomers in third-grade math. How did these students, who were high-achieving by eighth grade, perform in their earlier years? The vast majority of them were above-

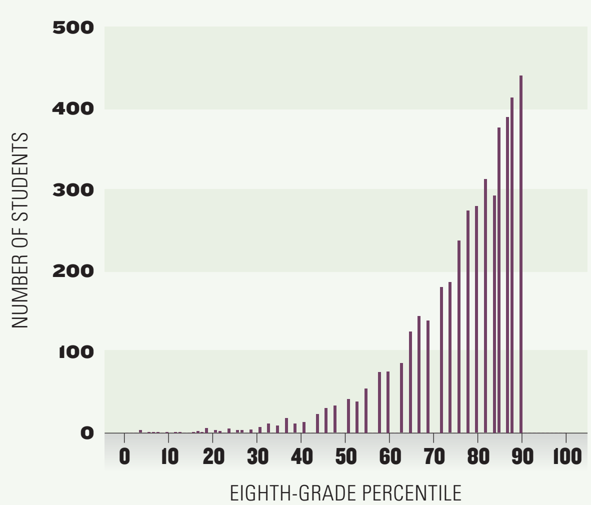


FIGURE 3

Eighth-Grade Performance of Descenders (Elementary/Middle Math)

Note: This figure illustrates the performance range of Descenders—those students who performed at or above the 90th percentile in third-grade math, but below the 90th percentile in eighth-grade math—in eighth grade by displaying the number of Descenders performing at each eighth-grade percentile. By eighth grade, few of those students performed below the 50th percentile, while many continued to perform near the 90th percentile.

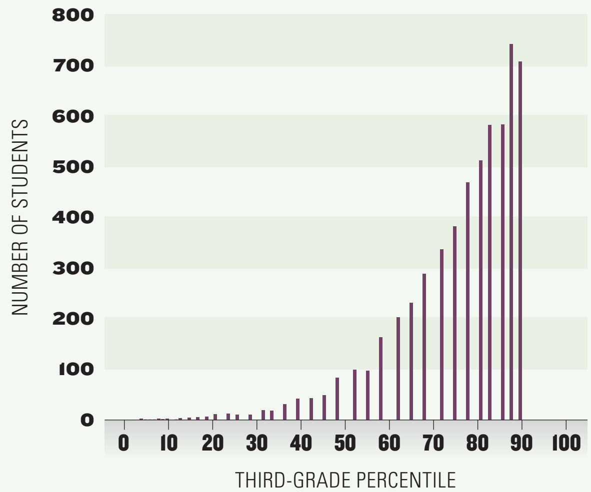


FIGURE 4

Third-Grade Performance of Late Bloomers (Elementary/Middle Math)

Note: This figure illustrates the performance range of Late Bloomers—those students who performed below the 90th percentile in third-grade math, but at or above the 90th percentile in eighth-grade math—in third grade by displaying the number of Late Bloomers performing at each third-grade percentile. In third grade, few of those students performed below the 50th percentile, while many performed near the 90th percentile.

average third graders, with overwhelming numbers performing between the 50th and 89th percentiles in third grade (by definition, they could not perform in the 90th percentile or above).

FINDING #3 High flyers grew academically at similar rates to low and middle achievers in math, but grew at slightly slower rates than low and middle achievers in reading.

As already noted, individual high flyers follow different trajectories throughout their academic careers: Some rise, some descend, and some maintain their altitude throughout their schooling. But every subject and grade has its high flyers; as a group, how much do they improve academically over time? Do they further outpace their low- and middle-achieving peers, or do those groups gain on the high achievers? To find out, we compared the academic growth rates of high-achieving students in reading and math in relation to middle achievers (those performing between the 45th and 54th percentiles, inclusive) and low achievers (those below the 10th percentile).[10]

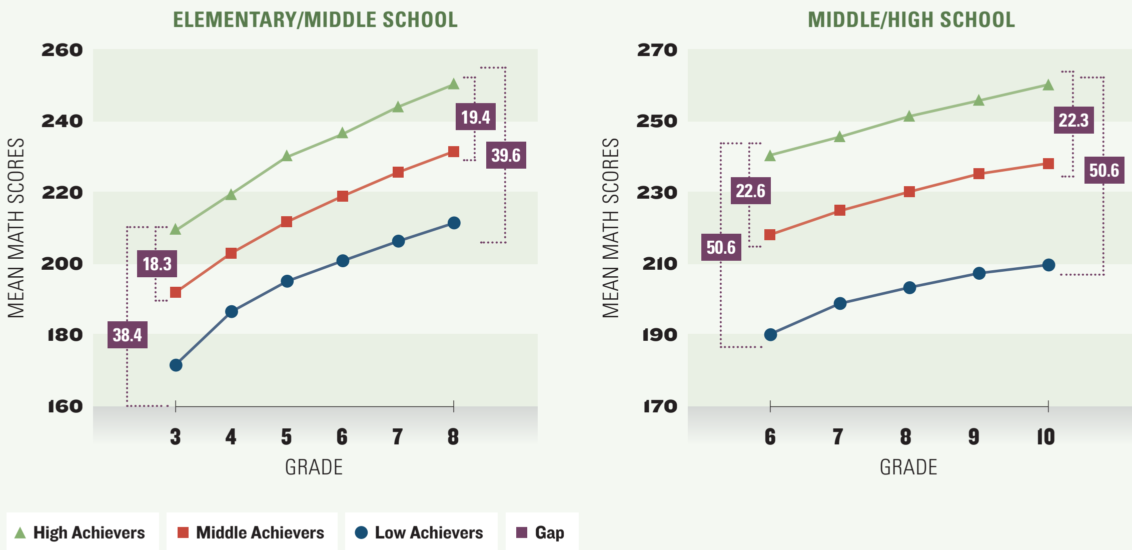
The performance gaps between high, middle, and low achievers were, as one would expect, quite large. In math, changes in those gaps over time were minimal. Elementary/middle school high achievers slightly increased their performance advantage over the other two groups between third grade and eighth grade, but those differences only amounted to an additional 25 percent of a year's growth for a typical high achiever (Figure 5). Even in eighth grade, the mean math scores of the low-performing group did not match the high achievers' third-grade marks, and middle-achieving eighth graders only ever matched the high achievers' fifth-grade marks. The pattern was similar for the middle/high school group: Gaps in mathematics performance between high, middle, and low achievers remained about the same over the four years (though the gaps between high and low performers were larger in magnitude at the middle/high school level than at the elementary/middle school level).

In reading, however, low- and middle-achieving students demonstrated faster rates of improvement than high achievers (Figure 6). The resulting narrowing of these performance gaps can be attributed to sluggish growth of those students at the

10 Growth here refers to the rate at which students increased their mean scores. To be included in the study, a student must have had test results for both the initial and final grades of the cohort. Thus the difference in average scores at these two points represents the actual growth of the group between these grades. Because members of the cohorts were not required to have a test result in each grade, the averages at the other grades do not necessarily reflect the actual mean growth of the group.

FIGURE 5

Academic Growth of High, Middle, and Low Achievers (Math)



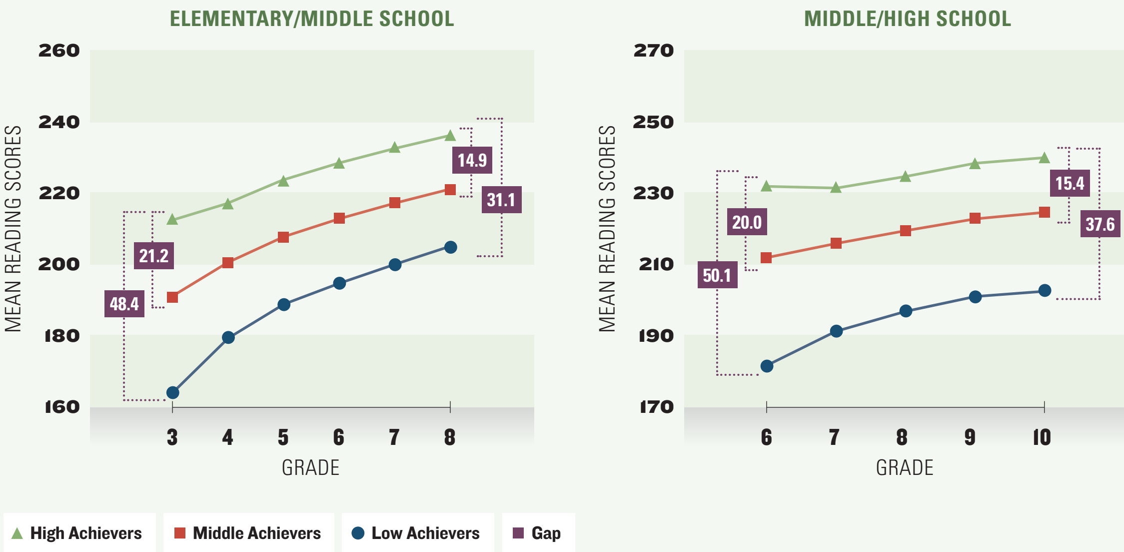
Note: These figures illustrate the growth in math achievement made by high, middle, and low achievers by plotting each group's mean scores between third grade and eighth grade (for elementary/middle school students) and between sixth grade and tenth grade (for middle/high school students). Performance is measured by NWEA's MAP assessments; scores can range from about one hundred to about 350. For example, low achievers in elementary/middle school improved their mean score from 172.0 to 211.2 in that time, while high achievers in elementary/middle school improved their mean score from 210.4 to 250.8, slightly increasing the performance gap between the two groups by 1.2 points.

top. From third grade to eighth grade, low-achieving elementary/middle school students grew nearly twice as fast on the assessment as high achievers, reducing the performance gap between the two groups by over a third. Middle achievers reduced their performance gap with high achievers by approximately 30 percent. High achievers still outperformed middle and low achievers by large gaps—once again low achievers never surpassed the third-grade mean of high achievers, and middle achievers never surpassed the high achievers' fifth-grade mean—but high achievers did not soar quite as high above their peers in eighth grade as they did in third grade.[11] Patterns were again similar in the middle/high school group, though the reduction in gaps was not as dramatic. Both low and middle achievers reduced their performance gaps with high achievers by about 25 percent.

11 The sluggish growth in reading as students advance in grade sometimes raises questions about possible ceiling effects on the test. This is commonly characterized as a lack of "room to grow." The assumption is that students are testing at or near the highest possible score on the test. The MAP test is adaptive, however, meaning high- and low-performing students receive more items targeted to their current achievement levels than they would receive on fixed-form assessments. Thus, there is less likelihood of ceiling effects. As evidence of this, standard errors on the reading test at the eighth-grade 90th percentile are not significantly different from those found in the middle of the distribution (NWEA, 2008), which typically means that students performing at the cut point are not challenging the ceiling of the test. Ironically, what appears to be sluggish reading growth may actually be tied to how reading development manifests itself among high achievers. At some point, reading development becomes subject-dependent, and tests of general reading may not adequately measure it. For example, a general test of reading ability typically will not include highly specialized science reading passages (e.g., an excerpt from a scholarly paper on genetic engineering), because students would require prior knowledge to understand such text. But it is precisely this type of specialized reading that many high achievers confront in high school.

FIGURE 6

Academic Growth of High, Middle, and Low Achievers (Reading)



Note: These figures illustrate the growth in reading achievement made by high, middle, and low achievers by plotting each group's mean scores between third grade and eighth grade (for elementary/middle school students) and between sixth grade and tenth grade (for middle/high school students). Performance is measured by NWEA's MAP assessments; scores can range from about one hundred to about 350. For example, low achievers in elementary/middle school improved their mean score from 164.3 to 205.1 in that time, while high achievers in elementary/middle school improved their mean score from 212.7 to 236.2, reducing the performance gap between the two groups by 17.3 points.

A CLOSER LOOK AT HIGH FLYERS IN HIGH-POVERTY SCHOOLS

In the current report, we defined high-achieving math and reading students as those with scores at or above the 90th percentile on NWEA's MAP assessments. This definition, however, excluded many students attending high-poverty schools; even when those students were high-performing relative to their peers, many did not perform at or near the externally normed 90th percentile. In an additional line of inquiry (to be described and discussed more fully in a forthcoming report), we examined a different group of students using a new definition of what it meant to be a high achiever. For those analyses, we defined high-achieving students as those whose math or reading scores placed them within the top 10 percent *of their individual grades and schools*. Using that school-based definition, we examined the relationship between school poverty and high achievers' academic performance and growth. We tracked an elementary school cohort from third grade to fifth grade, and a middle school cohort from sixth grade to eighth grade.

From the start, it was clear that this school-based definition of "high achiever" captured a different group of students: Many students in high-poverty schools who ranked at the top of their own classes did not rank at or above the larger 90th percentile based on overall NWEA norms. In other words, higher poverty rates generally predicted lower overall academic performance. In math, only 76.1 percent of third graders who were high-achieving within their schools achieved at or above the external 90th percentile—and this dropped to just 69.3 percent by fifth grade. In reading, 80.7 percent of high-achieving third graders performed at or above the external 90th percentile, and this declined to just 63.8 percent by fifth grade. Middle school students fared similarly, with 87.2 percent of high-achieving sixth graders surpassing the 90th percentile in math and only 69.3 percent doing so in eighth grade; in reading, the proportion fell from 83.9 to 61.4 percent between sixth and eighth grades. (Data not shown in tables.)

In terms of growth, however, we did uncover a surprising and encouraging trend: School poverty was not a strong predictor of student progress. High flyers at low-poverty schools performed on average at the 97th percentile in third grade math, while high flyers at high-poverty schools scored at the 83rd percentile—a difference representing over a year's worth of growth. By fifth grade, however, they scored at the 97th and 82nd percentiles, respectively. While high achievers in high-poverty schools grew slightly less than those in low-poverty schools, the difference was marginal. The same pattern held for middle school math. For both elementary and middle school reading, the gaps between high-achieving students in high- and low-poverty schools slightly diminished over time, but again, only marginally.

These findings suggest that the relationship between a school's poverty rate and extent of growth among its high-achieving students is very weak. In fact, both high- and low-poverty schools varied dramatically in the growth of their high achievers; in other words, high- and low-growth schools could be found among high- and low-poverty schools alike. Attending a low-poverty school improves the average high achiever's prospects for growth by very little; it appears that factors other than poverty control the growth of high achievers within a given school.[1]

1 Due to the limited number of schools available for the school factor analyses, we did not have a representative sample of all American schoolchildren in these grades. Our sample contained proportionally fewer high-poverty schools and urban schools. Note that our key finding—that a school's poverty rate is not a strong predictor of success for high achievers—might be less robust given a more balanced sample. Further, because student mobility within schools is likely to affect the average growth rates observed by those schools, a longitudinal design such as ours essentially disregards the potential impact of mobility on student growth. Thus, our findings must be considered preliminary and not conclusive. For more information on this line of analysis, see Appendix II.