The TALENT Act (S. 857/H.R. 1674)
Research & Resources

Thank you for attending *Leaving Talent on the Table: How the United States Leaves High-Ability Students Behind* hosted by the Council for Exceptional Children and the National Association for Gifted Children, sponsored by Representative Payne and Representative Gallegly.

Today's briefing provides compelling evidence that the United States consistently ranks below other industrialized nations in reading, math, and science scores on international assessments, threatening our nation's ability to compete globally. Federal policies, including the Elementary and Secondary Education Act, have done little to address the needs of gifted and high ability students. As a result the performance of our nation's highest achievers has remained stagnant and an achievement gap at the highest achievement levels is growing between students from minority and disadvantaged backgrounds and their more advantaged peers. This underachievement not only impacts our global standing but it perpetuates cycles of poverty and underperformance.

Of the numerous reports available, this briefing draws upon evidence from:

- *Mind the (Other) Gap!: The Growing Excellence Gap in K-12 Education* by Jonathan Plucker, Ph.D.; Nathan Burroughs, Ph.D.; Ruiting Song; Indiana University
- *U.S. Math Performance in Global Perspective: How Well Does Each State do at Producing High-Achieving Students?* by Eric Hanushek, Paul Peterson, Ludger Woessmann; Harvard Kennedy School
- *Do High Flyers Maintain Their Altitude? Performance Trends of Top Students* by Yun Xiang, Michael Dahlin, John Cronin, Robert Theaker, and Sarah Durant; Thomas B. Fordham Institute and North West Evaluation Association;
- *High-Achieving Students in the Era of NCLB* by Tom Loveless, Steve Farkas and Ann Duffett; Thomas B. Fordham Institute
- *The Achievement Trap: How America is Failing Millions of High-Achieving Students from Lower Income Families by Joshua Wyner, John Bridgeland, John Diiulio,Jr.;* Jack Kent Cooke Foundation
- *Preparing the Next Generation of STEM Innovators: Identifying and Developing Our Nation's Human Capital*; National Science Board
- *Are We Lifting All Boats of Only Some* by Jon Schnur, Joshua Wyner, Richard Epstein, Daniel Pianko

Attached, please find executive summaries of each of these reports for your review. As the briefing highlights, statistics produced by these reports should serve as a wake-up call for future education policy decisions:

- According to 2009 PISA results, the **U.S. ranked 14th in reading, 20th in science, and 28th in math, behind many other industrialized nations**[1].
- The percentage of student scoring at the advanced level varies considerably among the 50 states, but **none does well in international comparison**.[2]

[1] Hanushek, E., Peterson, P., Woessmann, L., (2010). *U.S. Math Performance in Global Perspective: How Well Does Each State Do at Producing High-Achieving Students?* Cambridge, MA: Harvard University.
[2] Hanushek, E., Peterson, P., Woessmann, L., (2010). *U.S. Math Performance in Global Perspective: How Well Does Each State Do at Producing High-Achieving Students?* Cambridge, MA: Harvard University.

- High-achieving students from disadvantaged backgrounds, when compared to their more advantaged peers, are **twice as likely to drop out of school**; more likely to **lose ground as they move forward in their schooling**; and are **less likely to attend or graduate from college**.[3]
- **A growing "excellence gap"** – the achievement gap at the top levels of academic performance on state and NAEP assessments -- between African American, Hispanic, or students from low-income backgrounds and their Caucasian and more advantaged peers that will take decades to close.
    - 9.4% of Caucasian students scored at the advanced level on the 8th grade NAEP in 2007, yet only 1.8% of Hispanic, 1% of African American, and 1.7% of students eligible for free or reduced lunch scored at the advanced level.[4]
- 44% of children from low socioeconomic backgrounds who are considered **high achieving when they enter school are no longer high achieving by 5th grade**.[4]
- **African American and Hispanic students are underrepresented in gifted education programs**: African American students represent 17% of the total student population, while their enrollment in gifted programs is 9%; Hispanic students represent 20% of the total student population while their enrollment in gifted programs is 12%.[5]
- **90% of teachers in a national survey reported that they would like more professional development** to better educate high-ability students.[6]

To combat these problems, the TALENT Act (S. 857/H.R. 1674):

- Recognizes that most of our classroom teachers lack deep training and experience in identifying and serving high-ability students and institutes a modest competitive grant program to help states provide access to **high-quality professional development** to begin having a classroom impact right now;
- Requires states and districts to **describe how they plan to serve high-ability students** within their federal Title I funding and professional development funding (Title II) plans;
- Produce a climate of **public accountability** where states and districts must report the performance of their top students on state tests so the community can determine whether additional supports are necessary;
- **Enhance the U.S. Department of Education research initiatives** to focus on strategies to better identify high-ability students not previously identified and to better educate all high-ability students. It also emphasizes **efficient dissemination of effective strategies into the classroom** to immediately help students and teachers.
- Enhance the U.S. Department of Education survey data collection on high-ability students so the education leaders and decision makers have accurate and up-to-date information on this special-needs population.

ESEA reauthorization is an opportunity to strengthen America's schools to benefit all students. For too long, ESEA has overlooked high-ability students at the peril of our nation's global competitiveness. The TALENT Act corrects this course by effectively addressing the challenges facing our nation's gifted and talented students, including those students who have not been identified as gifted and we ask for your support.

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[3] Wyner, J., Bridgeland, J.M., & Diulio, J. J. (2008). *The achievement trap: How America is failing millions of high-achieving students from lower income families*. Lansdowne, VA: Jack Kent Cooke Foundation.

[4] Plucker, J. A., Burroughs, N., & Song, R. (2010). *Mind the (other) gap: The growing excellence gap in K-12 education.* Bloomington: Indiana University, Center for Evaluation & Education Policy.

[4] Wyner, J., Bridgeland, J.M., & Diulio, J. J. (2008). *The achievement trap: How America is failing millions of high-achieving students from lower income families*. Lansdowne, VA: Jack Kent Cooke Foundation.

[5] Office of Civil Rights. (2006). *Projections for the nation of students receiving gifted and talented services.* Washington, DC: U.S. Department of Education.

[6] Farkas, S., & Duffett, A. (2008). *High-achieving students in the era of NCLB: Results from a national teacher survey*. Washington, DC: Thomas B. Fordham Institute.

MIND THE (OTHER) GAP!

The Growing Excellence Gap in K-12 Education

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February 4, 2010

CEEP Center for Evaluation & Education Policy

SECTION VI: CONCLUSIONS AND RECOMMENDATIONS

This brief has attempted to address a number of questions concerning the excellence gap in K-12 education:

1. Is There an Excellence Gap in K-12 Education?
A convincing body of evidence suggests that an achievement gap exists at higher levels of academic performance. The economically disadvantaged, English Language Learners, and historically underprivileged minorities represent a smaller proportion of students scoring at the highest levels of achievement. There is a gender gap as well, with females performing better in reading and males in performing better in math. The presence of an excellence gap is demonstrated both on national and state assessments of student performance. In addition, the proportion of all students (including more advantaged groups) that score at the highest level constitutes a relatively small share of all students, although national data suggests this situation is improving at some grade levels in some content areas.

2. Is the Excellence Gap Growing or Shrinking under NCLB?
As measured by the percentage of students scoring at the advanced level on the NAEP, the excellence gap has been stable or growing for each type of demographic group (gender, ELL, race, and free lunch eligibility). Since 2003, the proportion of these students' academic scores either stagnated or increased slightly, while over-represented groups have generally increased their educational performance. Trends of state assessments are equally troubling. Defining the excellence gap as gaps in performance at the NAEP 90th percentile gives somewhat different results, but although excellence gaps using this comparison are shrinking, they are doing so quite slowly. Whichever measure is employed, the final conclusion is clear: there has been little progress in substantially reducing excellence gaps since the passage of NCLB, particularly in reading. That said, there is little existing evidence to support claims that NCLB-mandated accountability systems are increasing excellence gaps.

3. Are Achievement Gaps at the NAEP Basic and Advanced Levels Related?
Whatever the effectiveness of ESEA/NCLB in shrinking the achievement gap at the level of minimum competence, there appears to be little comparable improvement at the advanced level. The relationship between gaps at the basic and advanced levels is weak at best. For Black and lower income students, smaller achievement gaps among minimally competent students is related to larger gaps among advanced students. However, gaps at the proficient and advanced levels exhibit some inter-relationship. Does a rising tide lift all ships? Our results suggest that the answer is "maybe," but if it does lift all ships, it lifts some more than others.

4. How Do State and National Policies Affect Excellence Gaps?
The federal government has paid scarce attention to achievement gaps at advanced levels of education or to advanced students generally, a neglect that is reflected in the focus of NCLB on minimum competency and the very small sum of federal monies targeted to gifted education. State governments demonstrate a widely varying commitment to educational excellence and gifted education, with a substantial number of states leaving advanced education entirely in the

hands of local school districts. There are tentative results suggesting that specific state-level policies could help reduce the size of excellence gaps, but a great deal of further study is required before any definitive conclusions can be reached.

RECOMMENDATIONS

Although there is evidence that large excellence gaps have existed in this country for many generations—and that too few American students achieve at the highest levels—a skeptic could note that these problems do not appear to have harmed the country in any great way.[16] This logic is understandable, but we believe it ignores at least four relatively recent developments that have greatly changed our national context.

Many commentators have noted that the world's best and brightest have traditionally been drawn to the United States for economic opportunity and freedom: Estimates of the percent of foreign-born PhDs working in science and engineering in the United States range from 36-40% (National Science Board, 2010). Due to (1) tighter immigration laws and regulations and (2) more opportunities in their home countries, many of these individuals are choosing to return home after university education in the U.S. – or simply stay home for postsecondary education and subsequent careers. Although we are generally not international alarmists, the (3) strong, recent emphasis on excellence and innovation through education in many developing and developed countries creates a strong competitive disadvantage to the American economy over the long term, especially as the proportion of underperforming American subgroups (i.e., Hispanic, ELL, and FARM students) increases.

Finally, (4) the current emphasis on minimum competency has pushed support for high-achieving students into the background of our national, state, and local conversation, a conversation that gave little attention to high-end learning *before* NCLB. Over time, the combination of these factors may have a negative effect on American economic competitiveness. Indeed, a recent report by McKinsey & Company (2009) suggests that the economic loss from achievement gaps – both minimum competency gaps and excellence gaps – is already substantial.

As a case in point, the National Science Board's (2010) recent report, *Science and Engineering Indicators 2010*, highlights some troubling data about recent trends in science, technology, engineering, and mathematics. Although the Board correctly suggests a wide range of potential causes for these trends, the report includes this cautionary note:

> The growth rate of the S&E labor force would be significantly reduced if the United States became less successful in the increasing international competition for scientists and engineers. Compared with the United States, many other countries are more actively reducing barriers to highly skilled immigrants entering their labor markets. Nonetheless,

[16] See Salzman & Lowell (2008) for such an argument.

> the United States is still an attractive destination for many foreign scientists and engineers. (p. 3-58)[17]

The report suggests that this is indeed beginning to happen, citing a forthcoming study by Finn, with the percentage of 2002 foreign doctorate recipients staying in the U.S. decreasing from 2003 to 2007, with the trend being somewhat stronger among graduates of top-rated programs.

In many ways, we are continually surprised that so few people appear to have considered the implications of not focusing on developing high-achieving students. But what may be even more perplexing is that the solutions to this problem, at least the initial steps, are not that difficult to identify:

1. Make Closing the Excellence Gap a National and State Priority.

Wyner, Bridgeland, and DiIulio (2009) estimate that 3.4 million high-achieving children live in households below the national median in income, over 1 million of whom qualify for free or reduced-price meals. They found evidence that, compared to upper-income children of similar ability, these children are more likely to show decreased achievement in later grades and drop out of high school, and they are less likely to attend college and earn a degree. Given the well-documented personal and economic costs of academic underachievement, this study illustrates the immediate and long-term dangers posed by festering excellence gaps.

Clearly this is an important national issue, and the scope of the problem is large. Whenever discussing education policy at any level, two questions should always be asked:

> How will this affect our brightest students?
> How will this help other students begin to achieve at high levels?

When reauthorizing ESEA, the questions should be asked. When debating a state funding formula or the creation of charter schools, the questions should be asked. When implementing a new high school chemistry curriculum, the questions should be asked. Until those two queries are reflexively added to each and every public discussion about education, we remain at jeopardy of letting excellence gaps persist for another generation of students. We believe changing the national discussion is achievable. It took years to get the needs of special education students front and center during these conversations, but it now happens. And policymakers have begun to ask routinely about how specific policies impact our STEM pipeline. One immediate step that can be taken is for the federal government (and all states) to publicize advanced level results in achievement testing reports, which would encourage the consideration of high-ability students during the policy-making process.

[17] In a related vein, Kerr & Lincoln (2008) provide interesting data on the positive impact of immigration on innovation.

2. Acknowledge That Both Minimum Competency and Excellence Can be Addressed at the Same Time.

Data continue to emerge supporting the notion that focusing too tightly on minimum competency will not automatically lead to excellence. At the same time, no one argues that focusing tightly on excellence will automatically get all students up to minimum competency. So we ask the challenging question: Why not focus on both? If this country can put people on the moon using 1960s technology, creating educational systems that bring students to competency *and* promote their ability to excel in certain areas does not seem impossible.

At the same time, policymakers need to acknowledge that, in most states, there are few financial incentives tied to moving students to high levels of achievement. Contrast that situation with the amount of funding targeted to struggling students. That funding may be well-warranted, but the current situation hardly comes across as an even-handed emphasis on the promotion of both excellence and minimum competency.

3. Set a Realistic Goal to Shrink Gaps.

Psychologists have noted that shrinking differences between groups is often difficult, because it is usually impractical (or unethical) to withhold an intervention from one group in order to benefit another. Yet both groups tend to benefit when an intervention is implemented – and the advantaged group, which may be better prepared to make use of the reforms, is often found to make more progress than the other group. [18] This phenomenon is not uncommon in education, and we suspect it would also apply here. This leads us to recommend avoiding Pollyanna-ish goals of "eradicating excellence gaps" that will never be achieved in our lifetimes. More reasonable goals might be, for example, to have at least 15% of students achieve at the NAEP Advanced Level, and to shrink most excellence gaps to 5% or less. Those targets will not be easy to achieve, yet they may be attainable.

4. Determine the Appropriate Mix of Federal, State, and Local Policies and Interventions.

Although new, innovative policies and practices will be needed, researchers and educators already know of several immediate steps that can be taken to promote high levels of achievement and shrink excellence gaps. For example, a number of recent reports have highlighted the advantages of certain approaches to ability grouping,[19] dual credit programs, Advanced Placement, and International Baccalaureate, among many others. Academic acceleration, a collection of interventions that allow bright students to proceed at a faster, more realistic pace of learning, enjoys tremendous research support yet is considerably underutilized

[18] See, for example, Ceci & Papierno (2005), Lubinski (2009), and Rothstein, Jacobsen, & Wilder (2006).

[19] We welcome the recent attention to ability grouping, which has considerable research support, but we dislike the frequent references to "tracking." Grouping is flexible, targeted, and not permanent; tracking historically refers to an inflexible approach to placing students in tracks from which they could not move. In many settings, tracking became an instrument for *de facto* segregation and, as such, the reemergence of the term as synonymous for "ability grouping" is distasteful. Tracking is unquestionably bad; ability grouping is arguably good.

(Colangelo, Assouline, & Gross, 2004). The National Research Center on the Gifted and Talented has conducted studies on the effects of specific interventions, a number of which show promising results.

Determining the proper mix of federal, state, and local policy, funding, and programming will not be easy, although we gently suggest that the highly chaotic nature of the current context provides us with a nearly blank slate. Currently, most decisions about gifted education are made at the local level, and when funding gets tight, programs designed to promote excellence are generally the first to go: Academic programs, artistic programs, music programs, and even the occasional athletic program. When funding isn't tight, a reflexive anti-intellectualism seeps into many of our minds, and excellence programs tend to fight constantly for their existence.[20] To overcome these problems, more responsibility for developing excellence in our K-12 schools needs to be assumed by state and national policymakers.

5. Include the Performance of Advanced Students in Discussions of Common Standards.

The current push for common standards presents a valuable opportunity to address the inconsistency among state policies for high ability students. Cross-state standards and testing regimes should have measurements with "high ceilings" and questions rigorous enough to capture the full range of student performance. States will need data capable of tracking the performance of high achievers if they are to craft comprehensive excellence policies that will reduce achievement gaps, and stakeholders will require such data if they are to hold state and local education agencies accountable.

The current call for "value-added" accountability systems may not directly benefit advanced students to the degree that many advocates expect. This approach, which focuses on student improvement rather than student performance at a single point in time, sounds helpful in theory. But in order to benefit advanced students, value-added systems need tests that have high ceilings: If a student gets nearly every item on a test correct at the beginning of the year, it is difficult to imagine how a test will show that "value" has been added at the end of the year.

6. Address the "Low-hanging Policy Fruit" Immediately.

Each state should quickly examine its policies that may help or hinder the promotion of high achievement in its K-12 schools. For example, we worked in one state that provided substantial financial aid for college to residents … but only if they had a high school diploma. Talented students who entered postsecondary education early were prohibited from receiving any type of high school diploma and therefore could not receive financial aid. The historical reasons for these restrictions are clear, but the policymakers never asked themselves the two questions mentioned above: How will this affect our brightest students? How will this help other students

[20] At the same time, we do not agree with the continual characterization of Americans as "anti-intellectual." Clearly the United States values excellence, and we support those individuals who develop high levels of skill and achievement. What American anti-intellectualism may reflect is our disdain for opportunities being offered only to the privileged, which is one reason for the existence of excellence gaps in the first place.

begin to achieve at high levels? Changing those policies to allow for early college entrants would be a low-cost, low-risk, high-reward policy change.

Similarly, some states have rigid age cutoffs for when a child can start kindergarten. Setting a maximum age makes sense (i.e., all students must start kindergarten by the year they turn six), but allowing children to start school when they are ready to do so is another low-cost, talent development strategy (e.g., we have seen too many bright children have to wait a year for kindergarten because they missed the age cutoff *by a week*). Letting students progress through K-12 schools as quickly as their ability and desire allow is a common-sense, research-supported policy intervention that over time should *save* money for schools (see *A Nation Deceived* by Colangelo et al., 2004).

7. Conduct More Research – *Much* More Research – on Advanced Learning and Talent Development.

The amount of money devoted to research on gifted education at the K-12 level pales so drastically in comparison to other areas of education research that a statistical comparison is not necessary. As a result, our knowledge of interventions to reduce excellence gaps is not nearly as comprehensive as will be necessary to solve the problem.[21]

In this regard, we find the data in Table 3 to be especially troubling: When we identified states with improving performance at the advanced level *and* shrinking excellence gaps, there was no pattern at all to the states performing well in Grade 4 versus Grade 8, in mathematics versus reading. For example, the analyses identified six states shrinking the Black-White excellence gap in Grade 4 reading, four states in Grade 4 math, three in Grade 8 reading, and two in Grade 8 math – unfortunately, no state appeared in more than one category. If a state-initiated policy were responsible for the good news tracked in Table 3, one would expect a state to show up in multiple categories. That this did not occur suggests that either little state-level policy work is helping the situation, and/or policies are widely inconsistent within states. Available evidence suggests that both explanations may be valid.

Yet increasing the federal support of research on high achievement need not require new funding – money could be set aside in existing U.S. Department of Education and National Science Foundation programs to fund applied research on high-end learning. Or grantees in specific programs could be required to evaluate how their projects impact high-achieving students rather than report only aggregated outcomes for all students.

[21] However, Harris and Harrington (2006) argue convincingly that we have little evidence that accountability-based interventions, among the most popular reforms of the past few generations, have significant impact on any achievement gaps. The lack of research on interventions spreads beyond the excellence gap.

U.S. Math Performance in Global Perspective

How well does each state do at producing high-achieving students?

Eric A. Hanushek
Paul E. Peterson
Ludger Woessmann

Prepared under the auspices of:

Harvard's Program on Education Policy and Governance & Education Next
Taubman Center for State and Local Government
Harvard Kennedy School

U. S. Math Performance in Global Perspective

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Executive Summary

Maintaining our innovative edge in the world depends importantly on developing a highly qualified cadre of scientists and engineers. To realize that objective requires a system of schooling that produces students with advanced math and science skills. To see how well the U.S. as a whole, each state, and certain urban districts do at producing high-achieving math students, the percentage of U.S. public and private school students in the high-school graduating Class of 2009 who were highly accomplished in mathematics in each of the 50 states and in 10 urban districts is compared to the percentages of similarly high achievers in 56 other countries.

Unfortunately, the percentage of students in the U.S. Class of 2009 who were highly accomplished in math is well below that of most countries with which the U.S. generally compares itself. No less than 30 of the 56 other countries that participated in the Program for International Student Assessment (PISA) math test had a larger percentage of students who scored at the international equivalent of the advanced level on our National Assessment of Educational Progress (NAEP) tests. While 6 percent of U.S. public and private school students rated as advanced in 8th-grade mathematics, 28 percent of Taiwanese students did. (See Figure 1, p. 16, for these results as well as for the relative rank internationally of each individual U.S. state.)

It is not only Taiwan that did much, much better than the U.S. At least 20 percent of students in Hong Kong, Korea, and Finland were highly accomplished, and 12 other countries had at least twice the percentage of highly accomplished students as the U.S.: Switzerland, Belgium, the Netherlands, Liechtenstein, New Zealand, the Czech Republic, Japan, Canada, Macao, Australia, Germany, and Austria. The only members of the Organization for Economic Co-operation and Development (OECD) taking part in PISA 2006 that produced a smaller percentage of advanced math students than the U.S. were Spain, Italy, Israel, Portugal, Greece, Turkey, Chile and Mexico. The performance of the U.S. cannot be distinguished statistically from that of Russia.[1]

The percentage of students scoring at the advanced level varies considerably among the 50 states, but none does well in international comparison. Massachusetts, with more than 11 percent advanced, does the best, but the performance of the Massachusetts Class of 2009 still trails that of 14 countries. Minnesota, ranked second among the 50 states, comes in at the same level as France, Sweden, Denmark, Iceland, Slovenia and Estonia. California students are roughly comparable to those in Portugal, Italy, Israel and Turkey, and the lowest ranking states—West Virginia, New Mexico, and Mississippi—have a smaller percentage of high-performing students than do Serbia and Uruguay (although they do edge out Romania, Brazil, and Kyrgyzstan).

In short, the percentages of high-achieving math students in the U.S.—and most of its individual states—are shockingly below those of many of the world's leading industrialized nations. Results for many states are at the level of developing countries.

1. Countries participating in PISA 2006 but not members of the OECD in 2010 that had lower results than the United States include Croatia, Uruguay, Romania, Brazil, Argentina, Azerbaijan, Montenegro, Qatar, Tunisia, Colombia, Indonesia, Jordan and Kyrgyzstan.

This is not simply the result of having a population that is heterogeneous and difficult to educate. Only 8 percent of white students in the U.S. Class of 2009 scored at the advanced level, a percentage that was less than the share of advanced students in 24 other countries regardless of their ethnic background. The percentage of white students in the state of New York rated as advanced (7.7) is roughly the same as the percentage of *all* students in Hungary and Norway; California's white students, 7.2 percent of whom score at the advanced level, are roughly even with *all* students in Poland and Ireland.

The portion of students in the Class of 2009 with at least one parent who graduated from college who are performing at the advanced level is 10.3 percent. In 16 countries, students of all backgrounds, regardless of their parents' education, do better than this advantaged segment of the U.S. population. The percentage of Illinois students with a college-educated parent who are highly accomplished is 9 percent, roughly the same percentage as for all students, regardless of background, in France and the U.K. Nearly 6 percent of Rhode Island's students from college-educated backgrounds score at the advanced level, the same percentage as all students in Italy, Spain, and Latvia, regardless of background. Uruguay and Bulgaria produce the same proportion of advanced students, no matter their background, as found among children of the college-educated in Mississippi, just 2.2 percent.

At the district level, while the percentages of highly accomplished public and private school students in Austin, Charlotte, and Boston exceed the U.S. as a whole, New York City trails these cities as well as Israel. San Diego, Houston, Washington, D. C., Chicago, Los Angeles, and Atlanta are all clustered below Uruguay and Bulgaria but above Chile, Thailand, Romania, Brazil, and Mexico, placing them at a level roughly equal to that of a Latin American country.

Some have attributed this comparatively poor performance to the focus of the 2002 federal accountability statute, No Child Left Behind (NCLB), on the educational needs of very low performing students. But, in fact, the percentage of students performing at a high level in math climbed steadily in the years following the law's passage. The incapacity of American schools to bring students up to the highest level of accomplishment in mathematics is much more deep-seated than anything induced by recent federal legislation.

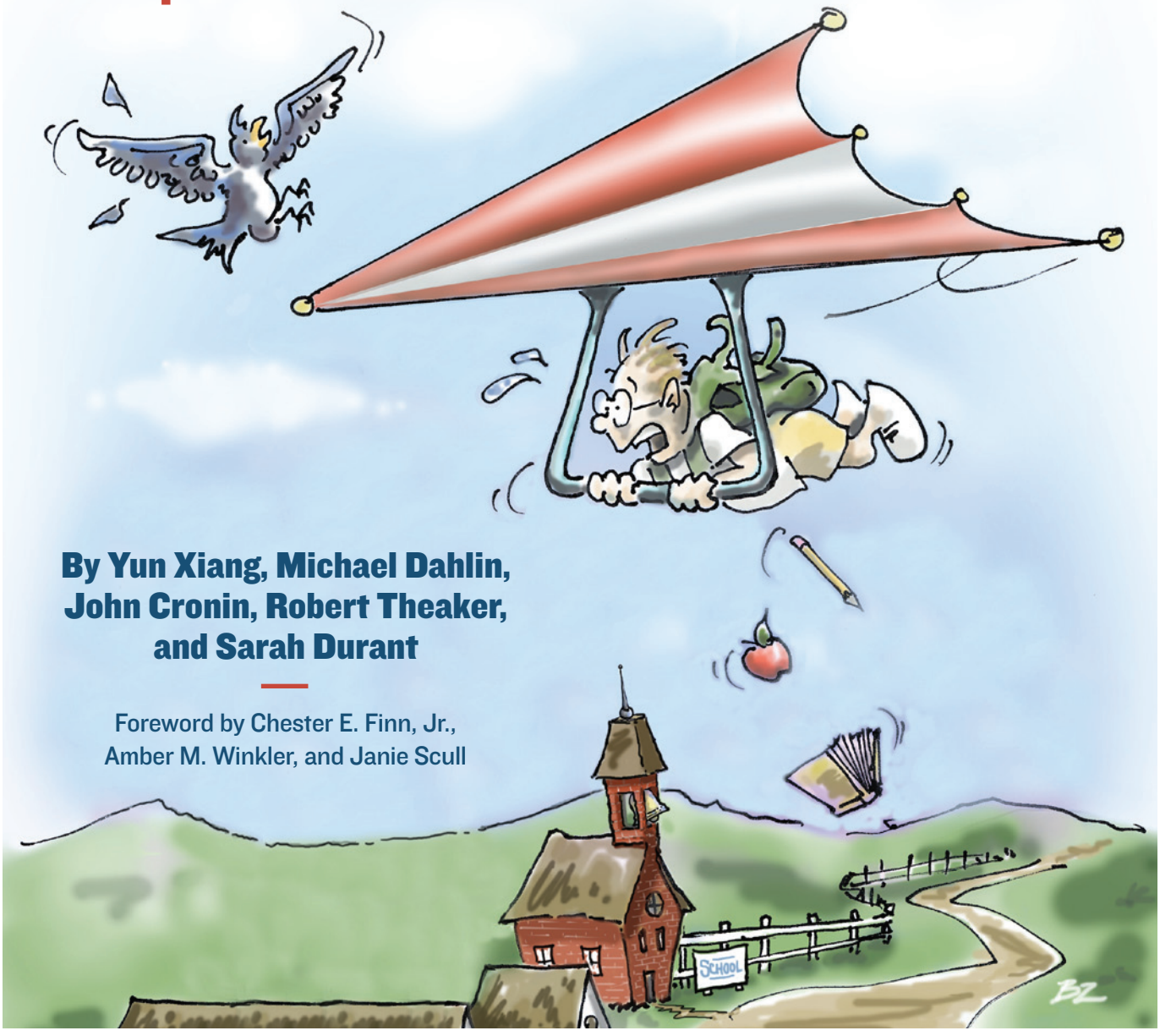
In sum, the U.S. trails other industrialized countries in bringing its students up to the highest levels of accomplishment in mathematics. It is not a story of some states' high performance being offset by the low performance of other states. Nor is it a story of immigrant or disadvantaged or minority students hiding the good performance of better prepared students. Comparatively small percentages of white students in the states achieve at a high level. And only a small proportion of the children of our college-educated population is equipped to compete with students in a majority of OECD countries. ◆

Only 8 percent of white students in the U.S. Class of 2009 scored at the advanced level.

SEPTEMBER 2011

DO HIGH FLYERS MAINTAIN THEIR ALTITUDE?

Performance Trends of Top Students



By Yun Xiang, Michael Dahlin, John Cronin, Robert Theaker, and Sarah Durant

Foreword by Chester E. Finn, Jr., Amber M. Winkler, and Janie Scull

THOMAS B. FORDHAM INSTITUTE
Advancing Educational Excellence

NWEA
Northwest Evaluation Association

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]

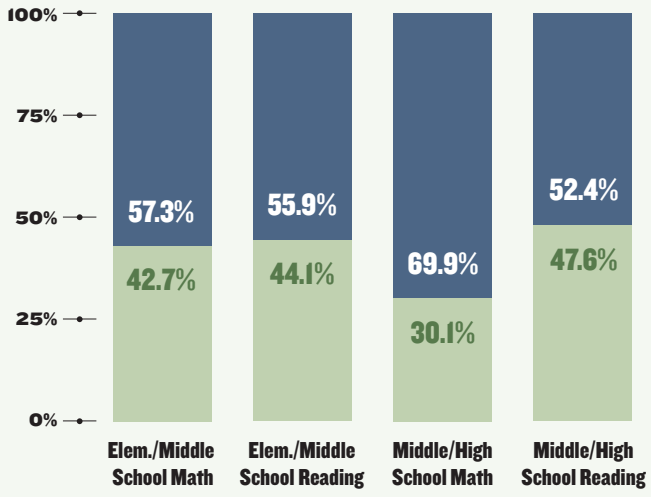


FIGURE 1

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.

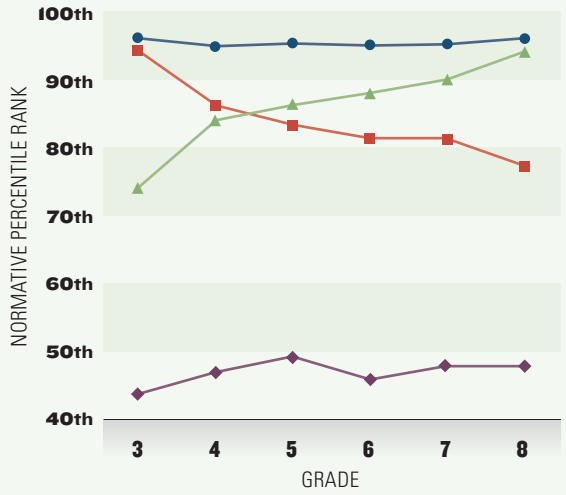


FIGURE 2

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-

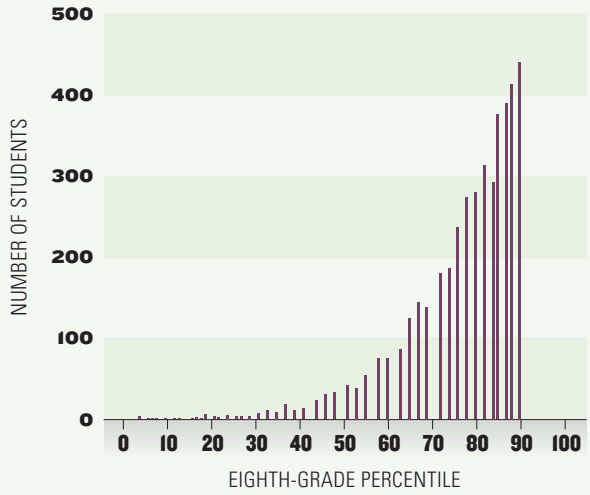


FIGURE 3

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.

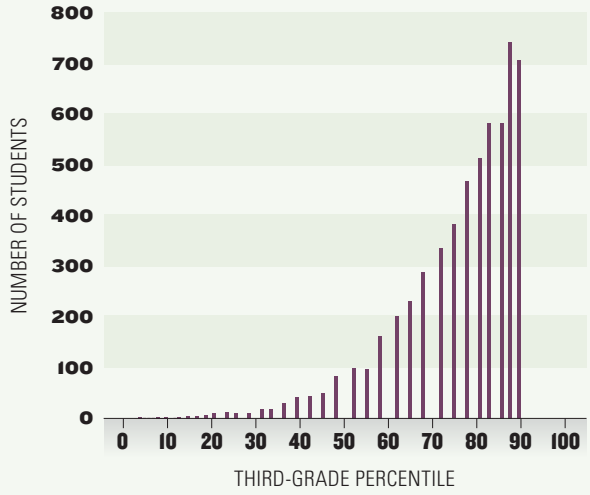


FIGURE 4

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]

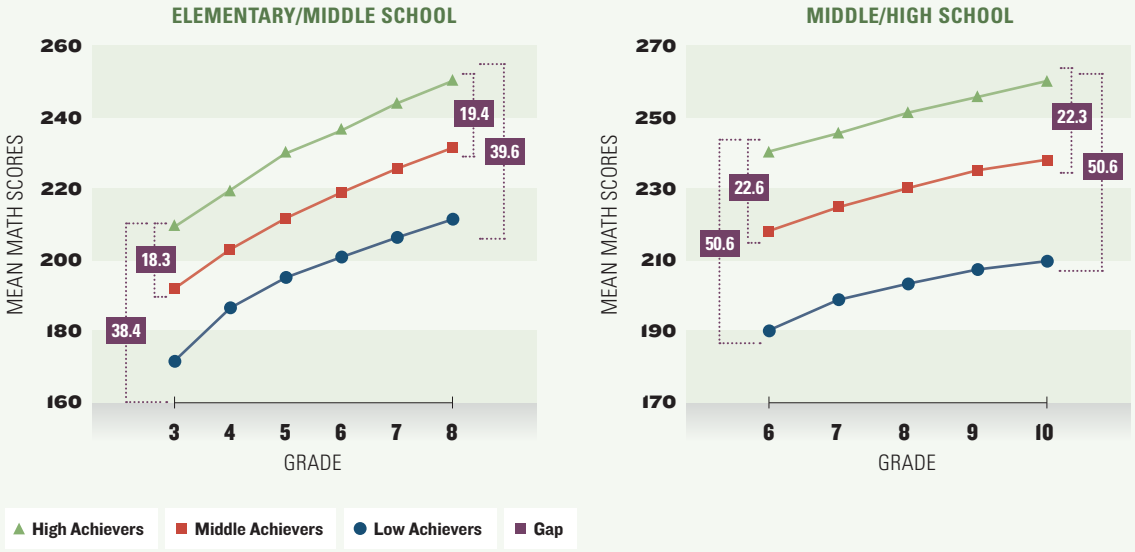
The performance gaps between high, middle, and low achievers were, as one would expect, quite large. In math, changes in those gaps over time were minimal. Elementary/middle school high achievers slightly increased their performance advantage over the other two groups between third grade and eighth grade, 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)



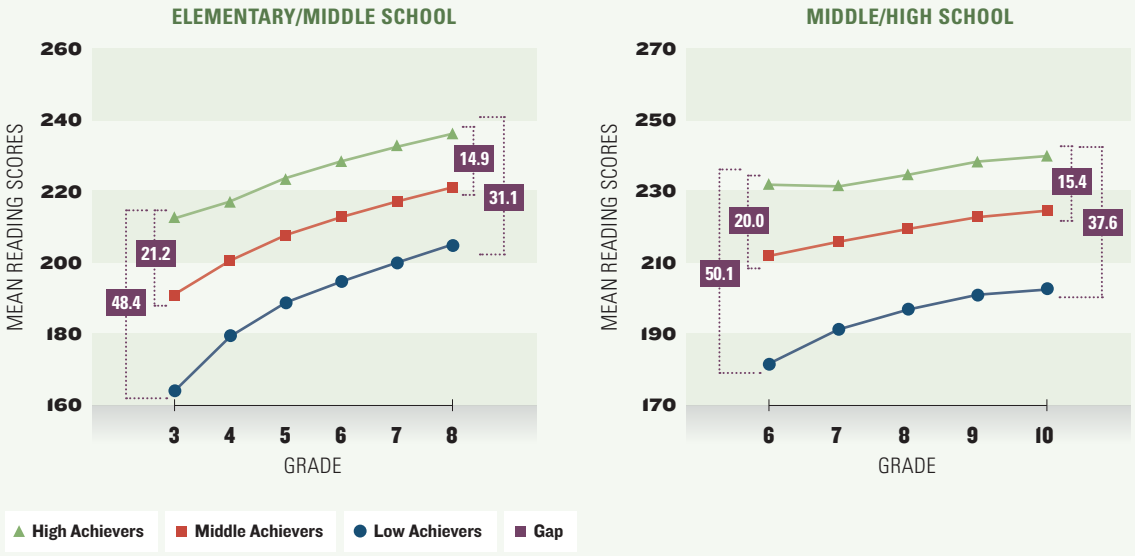
Note: These figures illustrate the growth in math achievement made by high, middle, and low achievers by plotting each group's mean scores between third grade and eighth grade (for elementary/middle school students) and between sixth grade and tenth grade (for middle/high school students). Performance 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.

High-Achieving Students
in the Era of NCLB

PART 1
AN ANALYSIS OF NAEP DATA
by Tom Loveless

PART 2
RESULTS FROM A NATIONAL TEACHER SURVEY
by Steve Farkas and Ann Duffett

Foreword by
Chester E. Finn, Jr. and
Michael J. Petrilli

THOMAS B. FORDHAM INSTITUTE

EXECUTIVE SUMMARY

This publication reports the results of the first two (of five) studies of a multifaceted research investigation of the state of high-achieving students in the No Child Left Behind (NCLB) era. *Part I: An Analysis of NAEP Data*, authored by Brookings Institution scholar Tom Loveless, examines achievement trends for high-achieving students (defined, like low-achieving students, by their performance on the National Assessment of Educational Progress, or NAEP) since the early 1990s and, in more detail, since 2000.

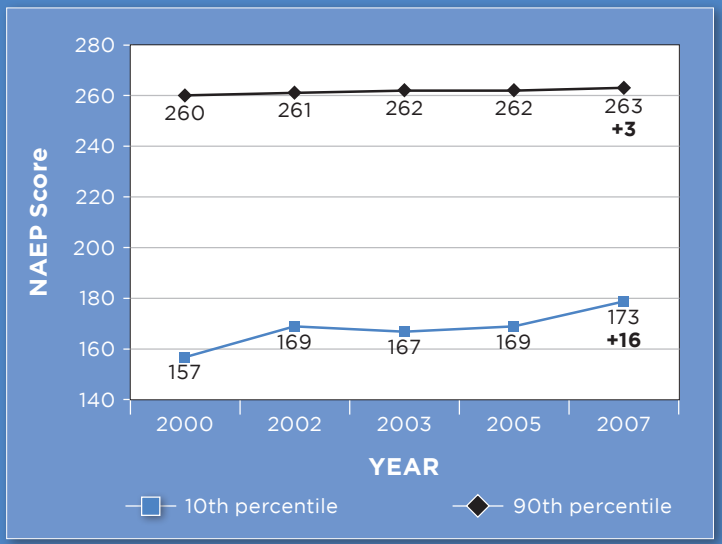
Part II: Results from a National Teacher Survey, authored by Steve Farkas and Ann Duffett of Farkas Duffett Research Group, reports on teachers' own views of how schools are serving high-achieving pupils in the NCLB era.

Here are the key findings:

- **While the nation's lowest-achieving youngsters made rapid gains from 2000 to 2007, the performance of top students was languid.** Children at the tenth percentile of achievement (the bottom 10 percent of students) have shown solid progress in fourth-grade reading and math and eighth-grade math since 2000, but those at the 90th percentile (the top 10 percent) have made minimal gains.

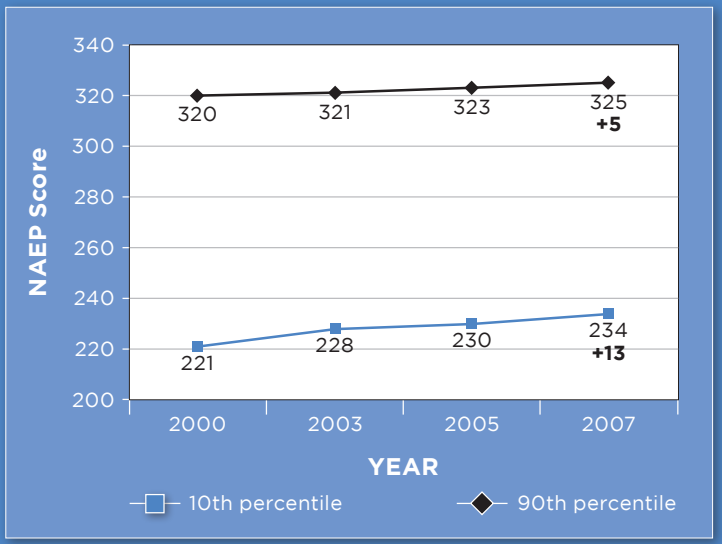
- **This pattern—big gains for low achievers and lesser ones for high achievers—is associated with the introduction of accountability systems in general, not just NCLB.** An analysis of NAEP data from the 1990s shows that states that adopted testing and accountability regimes before NCLB saw similar patterns before NCLB: stronger progress for low achievers than for high achievers.

***Figure A**—4th Grade Reading NAEP Scores, 2000-2007 (90th and 10th percentiles)*



***Note:** National means: 2000= 215, 2007=222, a change of +7*
Source: Main NAEP data explorer, National Public sample

***Figure B**—8th Grade Math NAEP Scores, 2000-2007 (90th and 10th percentiles)*



***Note:** National means: 2000 =274 and 2007= 281, a change of +7*
Source: Main NAEP data explorer, National Public sample

***Table i**—90th and 10th Percentile Gains, States with Accountability vs. States without Accountability (Pre-NCLB)*

1996-2000 4th Grade NAEP Math (state sample)

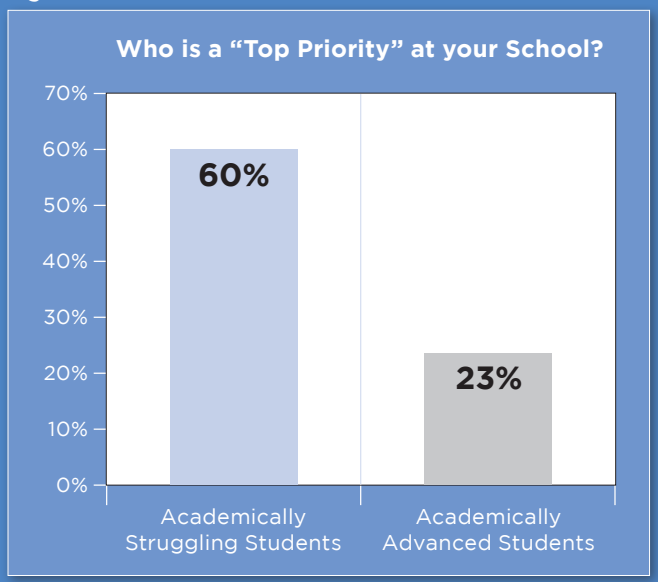
	90th	10th
Accountability | n=16	1.6	5.7
Non-accountability | n=20	2.5	1.9

***Note**—This means, for example, that states with accountability systems in the 1990s saw their lowest-achieving students (the 10th percentile) outpace their highest-achieving students (the 90th percentile), gaining 5.7 points versus 1.6 points. In non-accountability states the pattern was reversed, as high achievers slightly outpaced low achievers.*

Source: Tom Loveless's calculations from main NAEP data explorer, State NAEP sample. All data are in scale score points.

- **Teachers are much more likely to indicate that struggling students, not advanced students, are their top priority.** Asked about the needs of struggling students, 60 percent of teachers say they are a "top priority" at their school. Asked a similar question about "academically advanced" students, only 23 percent of teachers say they are a top priority. (They could give multiple answers to this question.)

Figure C:



Source: *FDR National Teacher Survey, Questions 3 and 4*

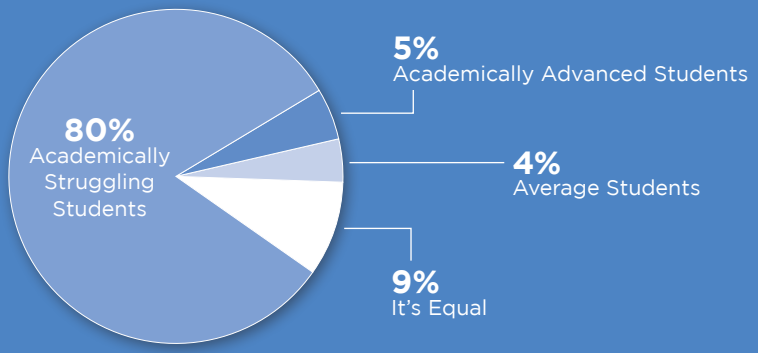
- **Low-achieving students receive dramatically more attention from teachers.** Asked "Who is most likely to get one-on-one attention from teachers?" 81 percent of teacher named "struggling students" while only 5 percent named "advanced students."

- **Still, teachers believe that all students deserve an equal share of attention.** Teachers were given the following choice: "For the public schools to help the U.S. live up to its ideals of justice and equality, do you think it's more important that they (A) focus on raising the achievement of disadvantaged students who are struggling academically OR (B) focus equally on all students, regardless of their backgrounds or achievement levels?" Only 11 percent chose the former, while 86 percent chose the latter.

- **Low-income, black, and Hispanic high achievers (on the 2005 eighth-grade math NAEP) were more likely than low achievers to be taught by experienced teachers.** These disadvantaged high achievers—termed "NCLB-HA" in the study—were also as likely as other high-achieving students to have teachers who had majored or minored in math.

Figure D:

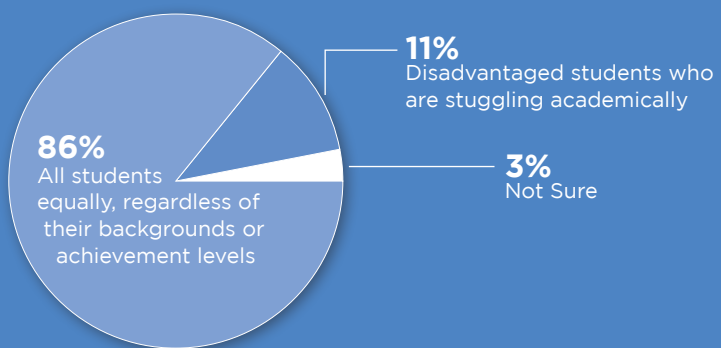
Who is Most Likely to Get One-on-One Attention from Teachers?



Source: *FDR National Teacher Survey, Question 11*

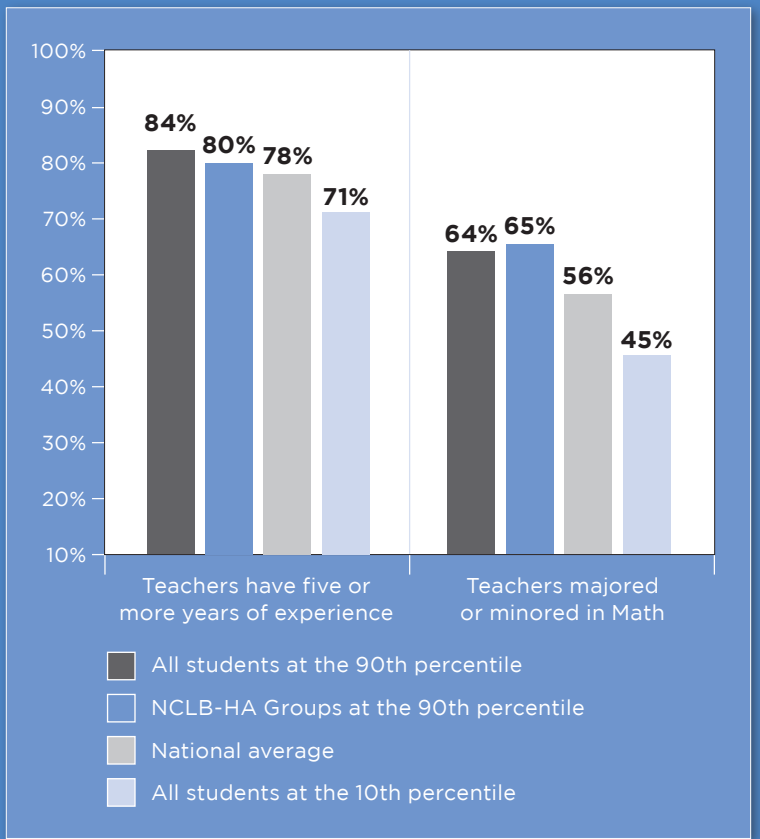
Figure E: *Teachers' Definition of "Justice and Equality"*

For the public schools to help the U.S. live up to its ideals of justice and equality, do you think it's more important that they focus on:



Source: *FDR National Teacher Survey, Question 26*

Figure F: *Teacher Characteristics: High-Achieving Disadvantaged Students and Comparison Groups (Drawn from the 2005 8th-Grade Math NAEP)*



Note: *This means, for example, that NCLB-HA students (high-achieving low-income, African-American, and/or Hispanic students) are just as likely as all high achievers to have teachers who majored or minored in math, and almost as likely to have teachers with five or more years of experience. They are much more likely than low-achieving students to have teachers with these attributes.*

Source: *Tom Loveless's calculations from restricted-use NAEP data.*

IMPLICATIONS

Neither of these studies sought a causal link between the No Child Left Behind Act and the performance of high-achieving students. We cannot say that NCLB "caused" the performance of the nation's top students to stagnate any more than it "caused" the achievement of our lowest-performing pupils to rise dramatically. All we know is that the acceleration in achievement gains by low-performing students is associated with the introduction of NCLB (and, earlier, with state accountability systems). Neither can we be sure from these data that teacher quality explains why some low-income, African-American, and Hispanic students were able to score in the top 10 percent on the 2005 eighth-grade math NAEP, though there does appear to be a relationship between the experience and education of math teachers and their students' performance.

The national survey findings show that most teachers, at this point in our nation's history, feel pressure to focus on their lowest-achieving students. Whether that's because of NCLB we do not know (though teachers are certainly willing to blame the federal law). What's perhaps most interesting about the teachers' responses, however, is how committed they are to the principle that all students (regardless of performance level) deserve their fair share of attention and challenges. Were Congress to accept teachers' views about what it means to create a "just" education system—i.e., one that challenges all students to fulfill their potential, rather than just focus on raising the performance of students who have been "left behind"—then the next version of NCLB would be dramatically different than today's.

achievementrap

BY: JOSHUA S. WYNER / JOHN M. BRIDGELAND / JOHN J. DIIULIO, JR.

How America Is Failing Millions of High-Achieving Students from Lower-Income Families

A REPORT BY THE JACK KENT COOKE FOUNDATION & CIVIC ENTERPRISES WITH ORIGINAL RESEARCH BY WESTAT

Advisory Board

EXECUTIVE SUMMARY

Today in America, there are millions of students who are overcoming challenging socioeconomic circumstances to excel academically. They defy the stereotype that poverty precludes high academic performance and that lower-income and low academic achievement are inextricably linked. They demonstrate that economically disadvantaged children can learn at the highest levels and provide hope to other lower-income students seeking to follow the same path.

Sadly, from the time they enter grade school through their postsecondary education, these students lose more educational ground and excel less frequently than their higher-income peers. Despite this tremendous loss in achievement, these remarkable young people are hidden from public view and absent from public policy debates. Instead of being recognized for their excellence and encouraged to strengthen their achievement, high-achieving lower-income students enter what we call the "achievement trap" — educators, policymakers, and the public assume they can fend for themselves when the facts show otherwise.

Very little is known about high-achieving students from lower-income families — defined in this report as students who score in the top 25 percent on nationally normed standardized tests and whose family incomes (adjusted for family size) are below the national median. We set out to change that fact and to focus public attention on this extraordinary group of students who can help reset our sights from standards of proficiency to standards of excellence.

This report chronicles the experiences of high-achieving lower-income students during elementary school, high school, college, and graduate school. In some respects, our findings are quite hopeful. There are millions of high-achieving lower-income students in urban, suburban, and rural communities all across America; they reflect the racial, ethnic, and gender composition of our nation's schools; they drop out of high school at remarkably low rates; and more than 90 percent of them enter college.

But there is also cause for alarm. There are far fewer lower-income students achieving at the highest levels than there should be, they disproportionately fall out of the high-achieving group during elementary and high school, they rarely rise into the ranks of high achievers during those periods, and, perhaps most disturbingly, far too few ever graduate from college or go on to graduate school. Unless something is done, many more of America's brightest lower-income students will meet this same educational fate, robbing them of opportunity and our nation of a valuable resource.

This report discusses new and original research on this extraordinary population of students. Our findings come from three federal databases that during the past 20 years have tracked students in elementary and high school, college, and graduate school. The following principal findings about high-achieving lower-income students are important for policymakers, educators, business leaders, the media, and civic leaders to understand and explore as schools, communities, states, and the nation consider ways to ensure that all children succeed:

WHO THEY ARE

- *Overall, about 3.4 million K-12 children* residing in households with incomes below the national median rank in the top quartile academically. This population is larger than the individual populations of 21 states.

- *More than one million K-12 children* who qualify for free or reduced-price lunch rank in the top quartile academically.

- *When they enter elementary school, high-achieving, lower-income students mirror America both demographically*

and geographically. They exist proportionately to the overall first grade population among males and females and within urban, suburban, and rural communities, and are similar to the first grade population in terms of race and ethnicity (African-American, Hispanic, white, and Asian).

AN UNEQUAL START

• *Starting-line disparities hamstring educational mobility.* Among first-grade students performing in the top academic quartile, *only 28 percent are from lower-income families, while 72 percent are from higher-income families.*

LOSING GROUND DURING K-12

• In elementary and high school, *lower-income students neither maintain their status as high achievers nor rise into the ranks of high achievers as frequently as higher-income students.*

> Only *56 percent of lower-income students maintain their status as high achievers in reading by fifth grade,* versus 69 percent of higher-income students.

> While *25 percent of high-achieving lower-income students fall out of the top academic quartile* in math in high school, only 16 percent of high-achieving upper-income students do so.

> Among those not in the top academic quartile in first grade, *children from families in the upper* income half are more than twice as likely as those from lower-income families to rise into the top academic quartile by fifth grade. The same is true between eighth and twelfth grades.

• High-achieving lower-income students drop out of high school or do not graduate on time at a rate twice that of their higher-income peers (8 percent vs. 4 percent) but still far below the national average (30 percent).

UNFULFILLED POTENTIAL IN COLLEGE & GRADUATE SCHOOL

• Losses of high-achieving lower-income students and the disparities between them and their higher-income academic peers persist through the college years. While more than nine out of ten high-achieving high school students in both income halves attend college (98 percent of those in the top half and 93 percent of those in the bottom half), high-achieving lower-income students are:

> Less likely to graduate from college than their higher-income peers (59 percent versus 77 percent);

> Less likely to attend the most selective colleges (19 percent versus 29 percent);

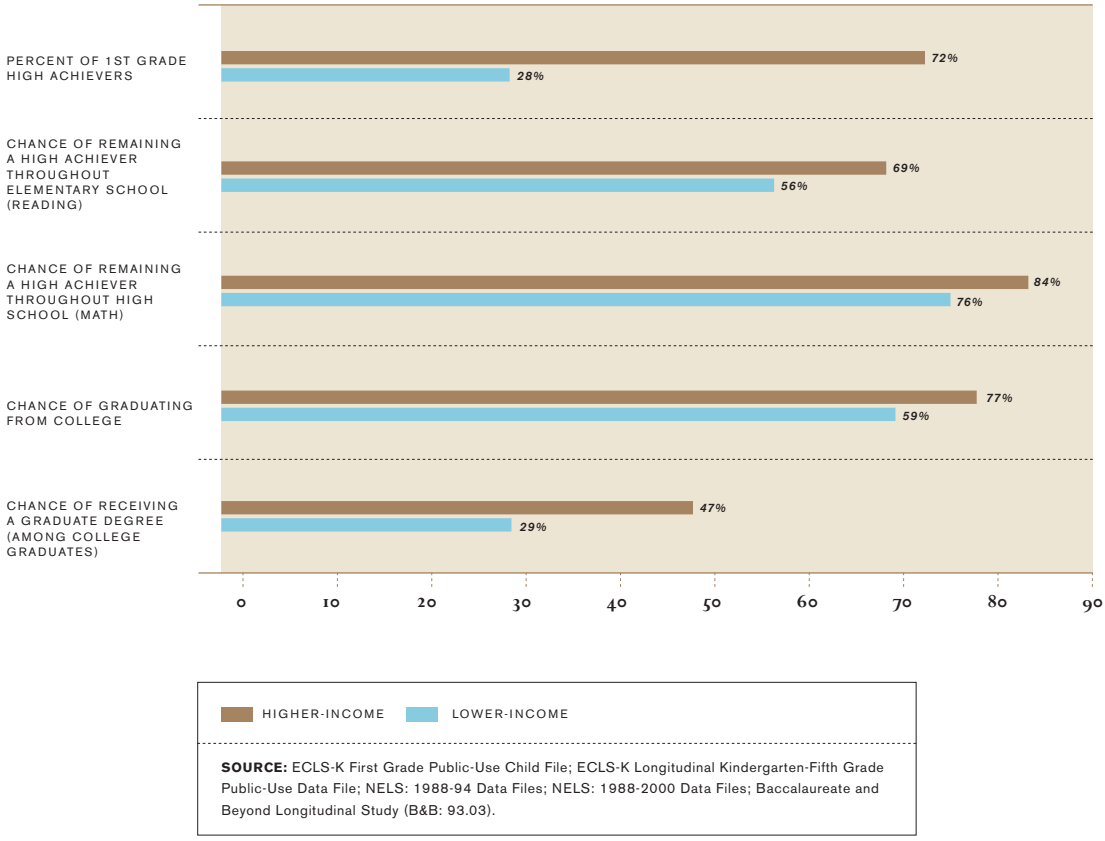
> More likely to attend the least selective colleges (21 percent versus 14 percent); and

> Less likely to graduate when they attend the least selective colleges (56 percent versus 83 percent).

• High-achieving lower-income students are much less likely to receive a graduate degree than high-achieving students from the top income half. Specifically, among college graduates, 29 percent of high achievers from lower-income families receive graduate degrees as compared to 47 percent of high achievers from higher-income families.

This pattern of declining educational attainment mirrors the experiences of underachieving students from lower-income families — they start grade school behind their peers, fall back during high school, and complete college and graduate school at lower rates than those from higher-income families. Our nation has understandably focused education policy on low-performing students from lower-income backgrounds. The laudable goals of improving basic skills and ensuring minimal proficiency

EDUCATIONAL DISPARITIES AMONG HIGH ACHIEVERS



SOURCE: ECLS-K First Grade Public-Use Child File; ECLS-K Longitudinal Kindergarten-Fifth Grade Public-Use Data File; NELS: 1988-94 Data Files; NELS: 1988-2000 Data Files; Baccalaureate and Beyond Longitudinal Study (B&B: 93.03).

in reading and math remain urgent, unmet, and deserving of unremitting focus. Indeed, our nation will not maintain its promise of equal opportunity at home or its economic position internationally unless we do a better job of educating students who currently fail to attain basic skills.

But this highly visible national struggle to reverse poor achievement among low-income students must be accompanied by a concerted effort to promote high achievement within the same population. The conclusion to be drawn from our research findings is not that high-achieving students from lower-income backgrounds are suffering more than other lower-income students, but that their talents are similarly under-nurtured. Even though lower-income students succeed

at one grade level, we cannot assume that they are subsequently exempt from the struggles facing other lower-income students or that we do not need to pay attention to their continued educational success. Holding on to those faulty assumptions will prevent us from reversing the trend made plain by our findings: we are failing these high-achieving students throughout the educational process.

NEXT STEPS

The time is at hand for targeting public policies, private resources, and academic research to help these young strivers achieve excellence and rise as high educationally as their individual talents can take them. Toward that end, our nation can take important steps to begin to bring this valuable and vulnerable population of students out of the national shadows:

> Educators, researchers, and policymakers need to more fully understand why, upon entering grade school, comparatively few lower-income students achieve at high levels and what can be done in early childhood to close this achievement gap.

> Federal, state, and local education officials should consider ways to broaden the current focus on proficiency standards to include policies and incentives that expand the number of lower-income students achieving at advanced levels.

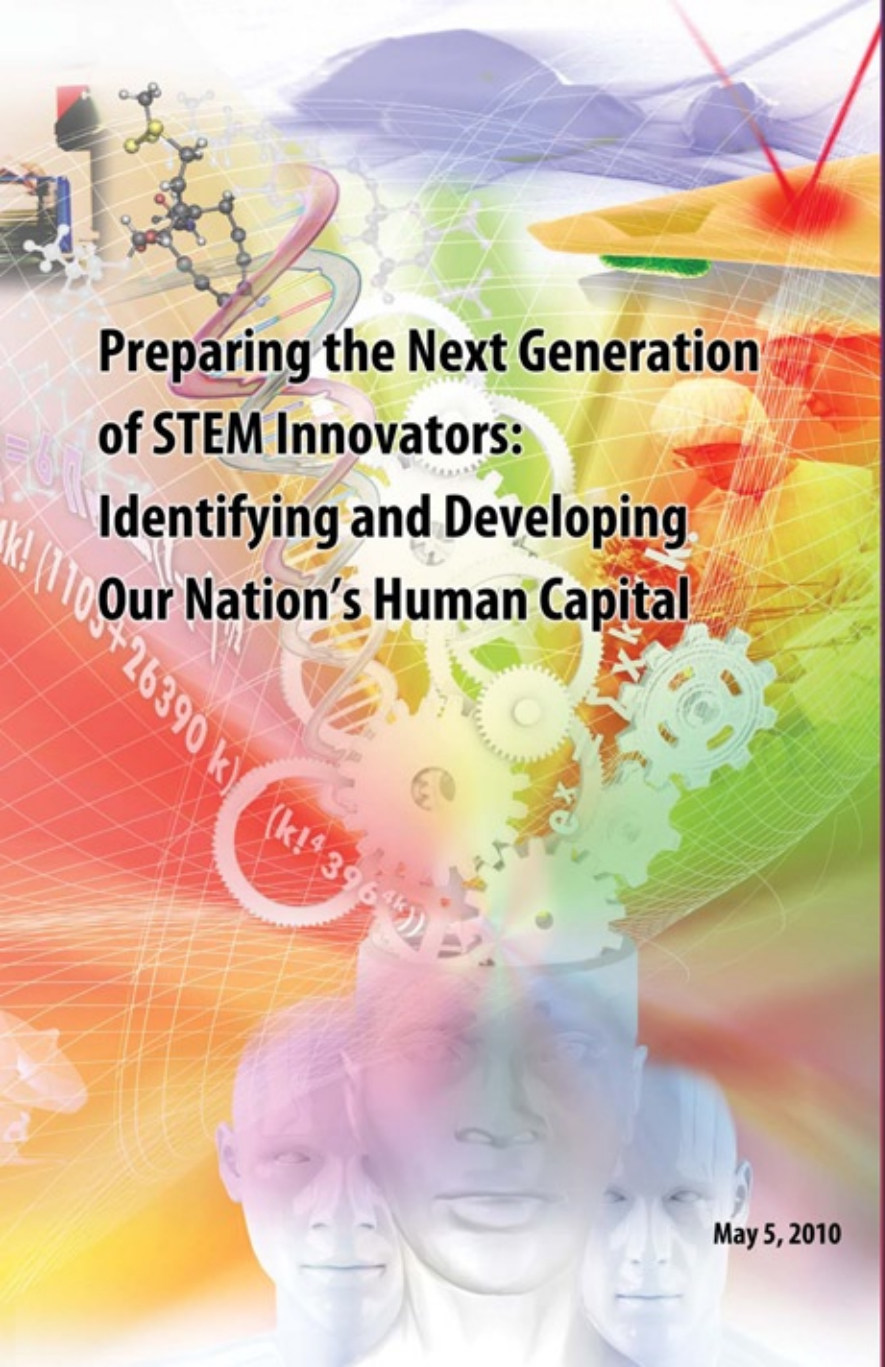
> Educators must raise their expectations for lower-income students and implement effective strategies for maintaining and increasing advanced learning within this population.

> Educators and policymakers must dramatically increase the number of high-achieving lower-income students who complete college and graduate degrees by expanding their access to funding, information, and entry into the full range of colleges and universities our nation has to offer, including the most selective schools.

> Local school districts, states, and the federal government need to collect much better data on their high-performing lower-income students and the programs that contribute to their success, and use this information to identify and replicate practices that sustain and improve high levels of performance.

Importantly, as each of these and related efforts unfold, we must consider how advancing policies and practices that assist high-achieving lower-income students can be used to help all students.

The picture painted by this report runs counter to the expectations we have of our educational institutions. As we strive to close the achievement gaps between racial and economic groups, we will not succeed if our highest-performing students from lower-income families continue to slip through the cracks. Our failure to help them fulfill their demonstrated potential has significant implications for the social mobility of America's lower-income families and the strength of our economy and society as a whole. The consequences are especially severe in a society in which the gap between rich and poor is growing and in an economy that increasingly rewards highly-skilled and highly-educated workers. By reversing the downward trajectory of their educational achievement, we will not only improve the lives of lower-income high-achievers, but also strengthen our nation by unleashing the potential of literally millions of young people who could be making great contributions to our communities and country.



Preparing the Next Generation of STEM Innovators: Identifying and Developing Our Nation's Human Capital

May 5, 2010

NATIONAL SCIENCE BOARD

NATIONAL SCIENCE FOUNDATION

NSB-10-33

PREPARING THE NEXT GENERATION OF STEM INNOVATORS:

Identifying and Developing our Nation's Human Capital

May 5, 2010

EXECUTIVE SUMMARY

On November 17, 1944, in the midst of World War II, President Franklin Delano Roosevelt wrote a letter to Vannevar Bush, head of the U.S. Office for Scientific Research and Development. In that letter, President Roosevelt posed the question:

> *Can an effective program be proposed for discovering and developing scientific talent in American youth so that the continuing future of scientific research in this country may be assured on a level comparable to what has been done during the war?*[1]

In *Science–The Endless Frontier*, Vannevar Bush offered his answer to this question. In his response, Bush called for the renewal of our scientific talent through the U.S. education system. He wrote:

> *The responsibility for the creation of new scientific knowledge rests on that small body of men and women who understand the fundamental laws of nature and are skilled in the techniques of scientific research. While there will always be the rare individual who will rise to the top without benefit of formal education and training, he is the exception and even he might make a more notable contribution if he had the benefit of the best education we have to offer.*[2]

A little more than a decade later, mobilized by the Soviet's successful launch of Sputnik, the United States embarked on a collective, coordinated, and sustained effort to recruit and educate the "best and brightest" who subsequently would form a new generation of leaders and innovators in science and engineering. This effort resulted in unprecedented scientific and technological progress, leading to the creation of new enterprises, new jobs, and the betterment of the national standard of living. At the root of this progress was a substantial investment in research and development, along with a nationwide focus on excellence in science, technology, engineering, and mathematics (STEM) education and talent development. Regrettably, by the 1970s, this national sense of urgency had diminished, and complacency soon supplanted the ideal of excellence in education. Today, faced with growing international competition, the cost of inaction continues to grow at an intensifying pace.

The National Science Board (Board) firmly believes that to ensure the long-term prosperity of our Nation, we must renew our collective commitment to excellence in education and the development of scientific talent. Currently, far too many of America's best and brightest young men and women go unrecognized and underdeveloped, and, thus, fail to reach their full potential. This represents a loss for both the individual *and* society. The Nation needs "STEM innovators"—those individuals who have developed the expertise to become leading STEM professionals and perhaps the creators of significant breakthroughs or advances in scientific and technological understanding. A key component of innovation is the development of new products, services, and processes essential to the Nation's international leadership. Just as in generations past, there are talented students from every demographic and from every part of our Country who with hard work and with the proper opportunities will form the next generation of STEM innovators. The vital importance of innovation to the U.S. economy led the Board to embark on a 2-year exploration of this issue.

Our analyses of research and demographic data, as well as our consultation with a wide range of experts, practitioners, policy-makers, and STEM innovators, led us to identify three major areas where focused attention is essential. First, while there are some examples of high-impact educational policies and practices that are effective in enabling tomorrow's potential STEM innovators to thrive, many more are needed. Second, a commitment to equity and diversity, and analyses of demographic trends, lead to the conclusion that new, ambitious efforts to cast a wide net in seeking and inspiring tomorrow's STEM leaders are critical. Finally, it is clear that when the learning environment is infused with high expectations and a commitment to excellence, the potential for future innovators to flourish is great.

To identify and develop the next generation of STEM innovators, the Board makes three *keystone recommendations*. Each recommendation contains several ***policy actions*** for the National Science Foundation (NSF), other Federal entities, and the Nation. Additionally, for each keystone recommendation, the Board proposes a ***research agenda*** for NSF that will ensure the policy actions are supported by the best available research. The keystone recommendations and a summary of the policy actions are listed below. The findings and research agenda can be found in the main body of the report (pp. 15-25).

Keystone Recommendations:

I. ***Provide opportunities for excellence.*** We cannot assume that our Nation's most talented students will succeed on their own. Instead, we must offer coordinated, proactive, sustained formal and informal interventions to develop their abilities. Students should learn at a pace, depth, and breadth commensurate with their talents and interests and in a fashion that elicits engagement, intellectual curiosity, and creative problem solving—essential skills for future innovation.

To achieve this goal, the Board proposes the following policy actions:

A. Encourage states and/or local education agencies to adopt consistent and appropriate policies on differentiated instruction, curriculum acceleration, and enrichment, and to recognize the achievement levels of students moving or transitioning to different schools.

B. Increase access to and quality of college-level, dual enrollment, and other accelerated coursework, as well as high-quality enrichment programs.

C. Support rigorous, research-based STEM preparation for teachers, particularly general education teachers, who have the most contact with potential STEM innovators at young ages.

D. Provide Federal support to formal and informal programs that have a proven record of accomplishment in stimulating potential STEM innovators.

E. Leverage NSF's *Broader Impacts Criterion* to encourage large-scale, sustained partnerships among higher education institutions, museums, industry, content developers and providers, research laboratories and centers, and elementary, middle, and high schools to deploy the Nation's science assets in ways that engage tomorrow's STEM innovators.

F. Create NSF programs that offer portable, merit-based scholarships for talented middle and high school students to participate in challenging enrichment activities.

G. Increase the technological capabilities and network infrastructure in rural and low-income areas, and expand cyber-learning opportunities.

H. Create a national database of formal and informal education opportunities for highly talented students, and publicize and promote such opportunities nationally to parents, education professionals, and content and resource providers.

II. ***Cast a wide net*** to identify *all* types of talents and to nurture potential in *all* demographics of students. To this end, we must develop and implement appropriate talent assessments at multiple grade levels and prepare educators to recognize potential, particularly among those individuals who have not been given adequate opportunities to transform their potential into academic achievement.

To achieve this goal, the Board proposes the following policy actions:

A. Improve pervasiveness and vertical coherence of existing talent assessment systems.

B. Expand existing talent assessment tests and identification strategies to the three primary abilities (quantitative/mathematical, verbal, and spatial) so that spatial talent is not neglected.

C. Increase access to appropriate above-level tests and student identification mechanisms, especially in economically disadvantaged urban and rural areas.

D. Encourage pre-service education and professional development for education professionals (including teachers, principals, and counselors) in the area of talent identification and development.

E. Encourage pediatricians and early childhood educators, especially *Head Start* teachers, to become knowledgeable about early signs of talent and the need for its nurturance.

III. ***Foster a supportive ecosystem*** that nurtures and celebrates excellence and innovative thinking. Parents/guardians, education professionals, peers, and students themselves must work together to create a culture that expects excellence, encourages creativity, and rewards the successes of all students regardless of their race/ethnicity, gender, socioeconomic status, or geographical locale.

To achieve this goal, the Board proposes the following policy actions:

A. Create a national campaign aimed at increasing the appreciation of academic excellence and transforming stereotypes towards potential STEM innovators.

B. Encourage the creation of positive school environments that foster excellence by providing professional development opportunities for teachers, principals, counselors, and other key school staff.

C. Support the expansion of computing and communications infrastructure in elementary, middle, and high schools to foster peer-to-peer connections and collaborations, and direct connections with the scientific research community.

D. Hold schools, and perhaps districts and states, accountable for the performance of the very top students at each grade.

E. Have NSF, in partnership with the Institute of Education Sciences, hold a high-level conference to bring together researchers in the learning sciences, other scientists, education school administrators, current teachers and principals, and teacher professional associations to discuss teacher preparation and pedagogical best practices aimed at fostering innovative thinking in children and in young adults.

The United States is faced with a clear and profound choice between action and complacency. The Board firmly believes that a coherent, proactive, and sustained effort to identify and develop our Nation's STEM innovators will help drive future economic prosperity and improve the quality of life for all. Likewise, providing opportunities for all young men and women to reach their potential will serve the dual American ideals of equity *and* excellence in education. The decisive action taken years ago in the wake of Sputnik created a legacy guaranteeing that today's generation would live in a more prosperous and secure society than that of their predecessors. It is our collective responsibility today to do the same, and ensure that future generations reap the benefits of our choice to act. We believe that the recommendations set forth in this report represent one step of many towards continuing this legacy.

IRePP
Stanford University
Institute for Research on Education Policy & Practice

WORKING PAPER # : 2008-07

Differential Growth in the Black-White Achievement Gap During Elementary School Among Initially High- and Low-Scoring Students

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March 2008

PRELIMINARY DRAFT:
comments & suggestions welcome

Direct correspondence to sean_reardon@stanford.edu. I appreciate the thoughtful comments of Steve Raudenbush, Derek Neal, participants in the University of Chicago Education Workshop, the University of Chicago Workshop on Black-White Inequality, and the Stanford Institute for Research on Education Policy and Practice Research Seminar. The errors are mine.

Differential Growth in the Black-White Achievement Gap During Elementary School Among Initially High- and Low-Scoring Students

sean f. reardon
Stanford University

Abstract

The black-white cognitive test score gap is a stubborn feature of U.S. schooling and society. In this paper, I use data from a nationally representative sample of children enrolled in kindergarten in the fall of 1998 to examine the extent to which black-white test score gaps grow differently among initially high- and low-achieving students. Two methodological challenges complicate such analyses: the presence of measurement error in the test scores and ambiguity regarding the interval-scaled nature of test score metrics. I suggest approaches to overcoming these challenges. I find that reading and math test scores diverge more between kindergarten and fifth grade among students who enter kindergarten with high levels of reading and math skill than among students who enter with low levels of reading skill. In fact, the gaps grow roughly twice as fast for students who begin school with scores one standard deviation above the mean as for those who begin one standard deviation below the mean.

EDUCATIONnext

Are We Lifting All Boats or Only Some?

Equity versus excellence and the talented tenth

By Richard A. Epstein, Daniel Pianko, Jon Schnur and Joshua Wyner

Summer 2011 / Vol. 11, No. 3

Education Next talks with Richard A. Epstein, Daniel Pianko, Jon Schnur, and Joshua Wyner

For a decade, at least since the passage of No Child Left Behind, the nation's foremost education goal has been to erase achievement "gaps" in which African American, Latino, and low-income students dramatically lag behind their peers. This emphasis has enjoyed broad support through the Bush and Obama administrations, and from major funders, but it raises the question of whether high achievers and gifted students have been overlooked along the way. Has a focus on reading and math proficiency, and on boosting graduation rates, meant less attention and support for the "talented tenth"? Richard A. Epstein, professor of law at New York University School of Law and senior lecturer at the University of Chicago, and Daniel Pianko, a partner at University Ventures Fund, argue that high achievers have paid a high price for our attention to struggling students. Jon Schnur, chairman of the board of New Leaders for New Schools, and Joshua Wyner, of the Aspen Institute, see no tension, and argue that equity-focused efforts to improve teaching and learning benefit students across the board.

Education Next: Is the education of the most able students in the United States being shortchanged? What evidence would you cite to support your position?

Jon Schnur and Joshua Wyner: Too many of our students at every achievement level are being shortchanged. Based solely on their race, ethnicity, and socioeconomic status, there are students at high, middle, and low levels of achievement who are not receiving the educational challenges they need to succeed and excel. While we have a growing and important number of small-scale breakthrough successes in American education, recently announced Program for International Student Assessment (PISA) results and other analyses show that we have performance gaps for our students at all levels of achievement relative to their peers internationally.

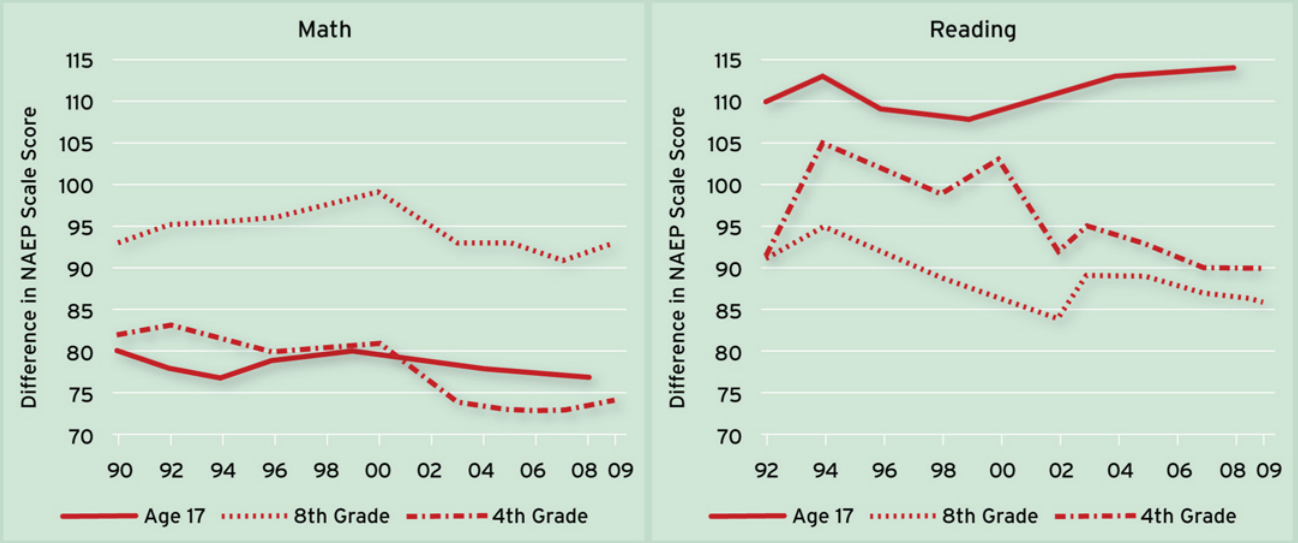
According to the 2009 PISA results, the U.S. ranked 14th in reading, 25th in math, and 17th in science among the 34 OECD (Organisation for Economic Co-operation and Development) countries. When we unpack these data, we see that U.S. students perform well below the

standard of readiness for college and/or careers, regardless of where they fall on the achievement continuum.

Meanwhile, within the United States, modest advances in the number of students achieving proficiency have not been accompanied by similar increases in the number of students from all backgrounds achieving at advanced levels. In a 2008 study, Tom Loveless found that from 2000 to 2007 our nation's highest-performing 10 percent of students made much smaller gains on the National Assessment of Educational Progress (NAEP) than our lowest-achieving 10 percent. A similar trend existed in some grades and subjects during the prior decade (see Figure 1). We need to make dramatically greater progress to help more students reach and remain at the highest level of achievement.

One Achievement Gap Narrows (Figure 1)

Except among 17-year-olds, the difference between the highest- and lowest-performing students has narrowed since 2000.



Notes: The difference is calculated by subtracting the scale score of the bottom decile from the scale score of the top decile. All scores are for public school students only, except for reading scores for 17-year-olds, which are for all students, public and private.

SOURCE: U.S. Department of Education, Main National Assessment of Educational Progress (4th grade and 8th grade) and National Assessment of Educational Progress Long-Term Trend (age 17)

While race- and income-based gaps are narrowing to some extent (especially in the earlier grades), four common but faulty assumptions could block progress toward closing these and other serious achievement gaps:

First, while most American schools will have to improve for our nation to reach internationally competitive education levels, many Americans assume that performance gaps exist only in someone else's community or schools. In a 2010 PDK/Gallup poll, only 18 percent of Americans surveyed graded our public schools nationally at an "A" or "B." By contrast, 77 percent of public school parents gave their oldest child's school an A or B, a percentage that grew by eight points over the prior five years. To offset such misperceptions, we need to require

that all schools in all districts report student performance—and calculate achievement gaps—using the same, internationally benchmarked standards.

Second, some mistakenly assume that a "talented tenth" strategy should focus on the schools and communities that already tend to achieve at the highest levels. The 2008 Achievement Trap study (Jack Kent Cooke Foundation) shows that low-income

students are less likely than other students to reach or remain at advanced levels of education at every grade. Access to rigorous coursework is unevenly distributed across American high schools, as shown by national audits of AP classes conducted by the College Board. And recent reports show that the fastest-growing gap between black and white students is at advanced levels of achievement. This is not surprising in some ways, given problems in current educational practice: we tend to provide less funding, have fewer outstanding teachers and principals, and require less rigorous coursework in schools that serve lower-income students. Not only is this grossly unfair, but our nation's economic competitiveness, given both the larger populations of countries like China and India and our rapidly increasing diversity, will depend on our tapping students from all backgrounds in order to supply the innovators, engineers, and leaders we need to succeed.

The promising news is that we know the *potential* to achieve at the most advanced levels is distributed widely. The growing number of schools successfully serving low-income students provides hard evidence that when these students have access to an excellent education they can reach levels achieved by their affluent peers. When schools and systems aim to improve what matters most, the entire culture and practice in a school building can change. Such schools hold expectations high and ensure teacher and school-leader excellence and effectiveness.

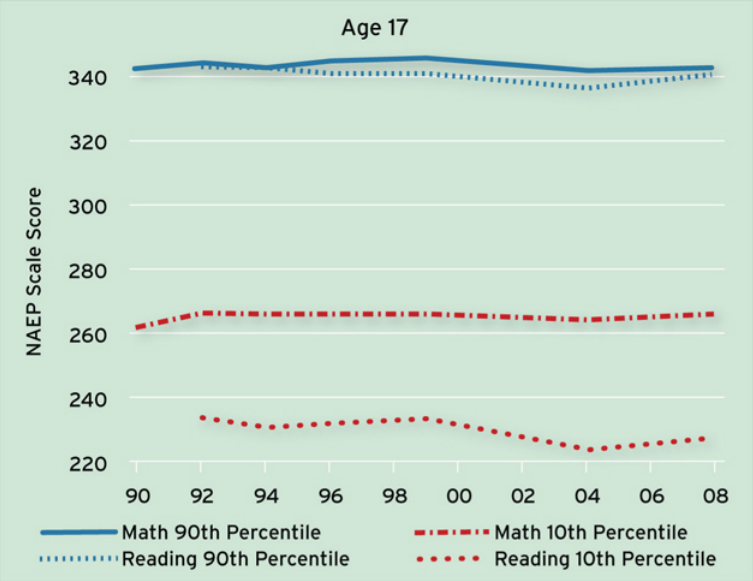
A poorly conceived "talented tenth" initiative risks failing to capitalize on the potential of students of all backgrounds to achieve at the highest levels. To avoid that outcome, we need to dramatically increase the number of high-performing schools serving low-income students.

Third, some assume that students already achieving at the highest levels will be successful without additional educational interventions and progress. But studies show that many students at the most advanced levels don't stay at that level without intensive work. Moreover, the stagnation of performance among America's most-advanced students shows the consequences of failing to meet their educational needs.

Finally, some falsely assume that the question is how we split up the existing pie of educational focus. Changing entire systems of education is the best strategy for improving overall performance *and* increasing the performance of advanced students, while also closing achievement gaps. A 2010 study by Richard Freeman and colleagues shows that countries that perform best on TIMSS (Trends in International Mathematics and Science Study) not only have a higher average score, but also have 1) less variation in performance and 2) smaller achievement gaps between different demographic groups. McKinsey & Co.'s most recent education report on how the best school systems improve cites evidence from Singapore, Finland, and elsewhere that improving overall performance can best be accomplished at the same time achievement gaps are closed.

Flatlining Test Scores (Figure 2)

The top-performing 17-year-olds in the United States test no better than they did 20 years ago.



Note: Math scores are for public school students only; reading scores are for all students, public and private.

SOURCE: National Assessment of Educational Progress Long-Term Trend

Richard Epstein and Daniel Pianko: Enormous sums of money have been poured into grades K through 12 since 1970. Measured in constant 2007 dollars, the expenditure per pupil in the United States more than doubled, from $4,060 in 1970 to $9,266 in 2008. Over that same period, achievement levels for students at age nine showed a moderate increase. Achievement levels for those aged 17 have been dead-level since 1990 (see Figure 2). A stagnant educational record in the face of massive increases in expenditures means that the current system has the unique distinction of failing both its strongest and its weakest students.

As Hanushek, Peterson, and Woessmann have shown, our best and brightest have been treading water, while other countries have caught up with or passed the United States. The most recent PISA results place the United States 31st of 56 participating countries in the percentage of students achieving at an advanced level in mathematics (see "Teaching Math to the Talented," *features*, Winter 2011). These weak numbers complicate the challenge posed by Schnur and Wyner. Unfortunately, not every student can benefit from advanced education, and it could well be that the best way to increase performance is to reduce the number of students included in these programs while continuing to focus on bringing all students to international standards. It is most difficult to broaden a base and increase average quality at the same time.

Indeed, within the current milieu, one major drawback is that our most able students are not so much "shortchanged" as they are ignored. One telling sign is that the federal government does not impose minimum standards for gifted education, even though the No Child Left Behind law

imposes all sorts of mandates to bring up the bottom. Nor does the federal government allocate dollars to gifted education. The one program of note, the Jacob Javits Gifted and Talented Students Education Act, has a long title, but its total expenditures were $7.5 million for 2008 out of the roughly $40 billion of allocated federal funds, a drop in the proverbial bucket in a nation where 6 percent of all students, some 3 million, are classified as gifted.

The situation at the state level is so erratic as to be schizophrenic. Illinois, for example, has one statewide test to identify the top math and science students and bring them together in one school. But most states do not allocate any funds specifically for gifted and talented students. New York City runs an extensive system for gifted and talented students, but the special appropriations at the state level are exactly $0. States are hard-strapped for cash, so there is little reason to think that these policies will be reversed with time.

State political leaders realize it is easier to ignore the needs of high-performing students. Tracking students into high-performing schools touches a third rail of racial politics. Unfortunately, it is likely that Caucasian and Asian students would disproportionately obtain places in these elite schools, which in the eyes of some would only widen the achievement gap. While the revolt against tracking students has had limited impact on those needing additional help, our nation has lost out on the long-term gains that gifted students could supply.

EN: In the past two decades, education policy has emphasized closing the achievement gap between low performers and high performers by raising the achievement of the low performers. Have the most-talented students paid a price for this focus?

Epstein & Pianko: Addressing the plight of students who are left behind is a noble, important goal. But the two goals of educating all Americans and providing the talented tenth with the specialized instruction they need do not have to be mutually exclusive. The Holy Grail of educators for the past 20-plus years has been to find ways for students of different abilities and aptitudes to learn at different paces in the same classroom. Educators have developed remarkably effective methods for achieving this goal for the early grades. However, this paradigm starts to break down by the time students reach middle school. The challenges become insuperable by the time students reach high school. The difference between those students capable of doing calculus and those who are barely ready for geometry, is too dramatic for even the ablest teachers to span in one classroom. Either there is separate education, with whatever perceived stigma it might have, or students at both ends of the spectrum will languish.

The real issue is a perception that a focus on gifted programs must automatically detract from children who are not achieving at grade level. To the contrary, the Loveless study cited above offers some support for the proposition that high performers suffer systematically from the focus on closing the achievement gap, while there is limited data that grouping all students together improves the quality of education for struggling students. No Child Left Behind only aggravates the problem because it is directed solely at keeping students and the schools that they attend above some failure line. A 10 percent improvement in the performance of gifted students counts for naught if a tiny fall in the performance of the weakest students puts the school out of compliance with federal standards. As elsewhere in life, you get what you measure and pay for.

Policymakers expend virtually all dollars to cluster students above some pass-fail line, not for excellence at the top.

Schnur & Wyner: The answer to both parts of this question is no.

Policies over the past decade have neither substantially harmed nor significantly helped the achievement of our highest-performing students. While we haven't seen substantial gains for students at advanced levels, there is no evidence to suggest that there have been overall declines, either. Still, we can't afford stagnation of performance for any of our students.

EN: What policies would you support to ensure America's future competitiveness and prosperity? Should we target our limited resources to boost literacy and numeracy in the general population or invest in STEM (Science, Technology, Engineering, and Mathematics) and other programs aimed at the "talented tenth"?

Schnur & Wyner: As we argue above, the evidence shows this is a false choice. The data from countries around the world refute the fundamental assumption that we can only do one or the other. The highest-performing countries in the world not only have the highest raw achievement scores, but also the smallest achievement gaps between subgroups within their population. High-functioning education systems that pay attention to the needs of individual students serve all children well. Therefore, it is not a decision about how to target scarce resources to one specific subgroup at the expense of another.

Ultimately, America's competitive advantage rests on a public education system that pushes beyond the limits of the "talented tenth" paradigm and fully develops the human capital of far more of our students. After all, if we can only rely on our top 10 percent to drive our economy, we're on a losing path, since China and India are already fielding competitive teams of far greater size.

That's why we need an education agenda that strategically recruits, retains, and rewards the most effective teachers and principals; that builds incredibly high standards; that develops rigorous and useful assessments to measure progress against those standards; that builds data systems that allow teachers, principals, students, and parents to quickly and conveniently access those data for everyday use; and that focuses on dramatic intervention within our country's lowest-performing schools. We need an accountability system that holds schools and school systems accountable for all of their students, including the lowest- and highest-achieving.

This comprehensive approach offers the best chance to improve outcomes for every student, from our "talented tenth" to students languishing grade levels behind. It guarantees that we have a system that attracts the best talent to support success, sets clear goals, measures progress toward those goals, gives educators information they can use to improve student outcomes, and demands dramatic action in the face of persistent failure. A few specific policies can help foster this reality:

Raise K–12 standards to assess and drive readiness for success in college and careers. Improve the rigor of what students are taught and build better tools for assessing what they have learned.

Tremendous recent progress has been made through adoption of the Common Core by 44 states and the nascent plans of multistate consortia to create better tests of student work that align with the Common Core.

Increase access to the most rigorous courses. Ensure that every high school offers high-quality AP classes in core subjects and that districts prepare students of every racial and socioeconomic group in earlier grades to succeed in AP.

Set targets for advanced learning and measure student growth toward them. Continue the state-by-state efforts to measure the growth of every student. Assiduously collect and report the numbers of advanced learners as well as gaps between subgroups, and hold educators accountable for ensuring that gaps are closed at every level of achievement, including advanced. At the same time, we can't allow for definitions of academic growth and achievement to focus too narrowly on exams (the approach embodied by NCLB). Instead, we know that students learn, think, operationalize, and develop differently—they all have the potential to serve as our next generation of innovators, entrepreneurs, and scientists.

Adopting these policies can contribute to a culture in which we have high aspirations for every student, hold great expectations for every teacher, and no longer abide the notion that our nation must choose between excellence and equity. In the end, only if we reform our schools at scale to improve teaching practice will we succeed. By driving every education practice toward excellent outcomes for every child, intentionally moving each student from where they are to a much higher level, our nation will be able to realize its ideal of eliminating gaps in education and opportunity and, thereby, regain its place among the world's education leaders.

Epstein & Pianko: It is a national economic imperative that the United States maintain its (fast-eroding) advantage in innovation, which comes from the talented tenth. There is a tremendous body of research that shows that innovation, which sparks new industries and job creation, originates from the minds of a few. Since we fail to focus attention on increasing the aggregate number of Americans capable of achieving radical innovation or starting new entrepreneurial endeavors, we have likely sacrificed any number of start-ups that could have led to a Fortune 500 company or the next Facebook.

Figuring out how to do this is of course the hardest problem. Schnur and Wyner point to the role of increased standards through the Common Core and the success of certain high-performing schools. The Common Core, even assuming the most robust application, sets a baseline that by definition our future Facebook founders must exceed by orders of magnitude. We agree wholeheartedly that the standards for all students must be raised dramatically, but the opportunities for our highest-achieving students must include coursework that is radically beyond the Common Core.

Fundamentally, we do not accept that this is an "either/or" debate about whether to prioritize low- or high-performing students. We believe that there is a "both/and" solution that drives achievement for all students. All students would benefit from allowing self-directed, advanced learners to take some portion of their coursework online and/or at their own pace. Technology has opened up a remarkably cheap and efficient methodology for providing individually tailored

instruction. State and federal policymakers must move decisively to create online programs to expand learning options for all students, including the talented tenth (see "Virtual Schoolteacher," *school life*). States and/or the federal government could identify best practices for online skill assessments that all students could take at key break points in their school careers (e.g., 6th grade or 9th grade). Students who score well on such an exam could 1) complete lower-level coursework by learning online at their own pace so they can advance more quickly to higher-level coursework and 2) take advantage of a national network of advanced coursework.

Ideally, students would proceed online at their own pace and have access to in-person teacher assistance as needed. New York City, through its School of One and iZone/iLearn programs, is piloting such a strategy right now. Policymakers should encourage (or push) districts to create similar options for their students by tying Title I and other federal aid programs to initiatives that promote online learning for the most talented students and that also provide physical locations for these students to do their advanced group work. For example, each intermediate unit or district of more than 50,000 students might be required to create math and science academies, which offer a portion of their instruction online, with in-person practical application or advanced work. Allowing students to continue in regular schools for some courses while doing advanced work in others (see "High Schoolers in College," *features*) may well be the best solution.

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