State Test Score Trends Through 2008-09, Part 5

Progress Lags in High School, Especially for Advanced Achievers

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Introduction

For decades, researchers, policymakers, and the media have raised concerns about the academic achievement of high school students. High dropout rates, mediocre achievement relative to other nations, and inadequate readiness for college and careers have led some analysts to conclude that the U.S. is facing a crisis in high school education (Swanson, 2009; Boys and Girls Clubs, 2010; Alliance for Excellent Education, n.d.). Many high school students, especially in urban schools, are alienated from school and lack the motivation to perform well (Swanson, 2009; National Research Council, 2003).

If achievement is indeed a problem in high school, to what extent is this apparent in trends on state tests? This report by the Center on Education Policy (CEP), an independent nonprofit organization, examines trends in the achievement of high school students on the state reading/English language arts (ELA) and mathematics tests used for accountability under the No Child Left Behind Act (NCLB). In most states, these tests are first administered in grade 10 or 11, although some states use end-of-course exams not tied to a particular high school grade. We looked at trends from 2002 (or a more recent year in several states) through 2009 for high school students overall and for African American, Asian American, Latino, Native American, white, low-income, male, and female students. Trends in average (mean) test scores were analyzed, along with trends in percentages of students scoring at or above the proficient and advanced levels of achievement on state tests. We also compared trends at the high school level with those at grades 4 and 8.

Forty states and the District of Columbia had sufficient data to be included in at least some of the analyses for this study. (D. C. is counted as a state in the tallies in this report.) States were omitted if they had too few years of comparable test data due to changes in their tests or their cut scores for proficient performance.

Key Findings

Our study confirms that there is reason for concern about the achievement of high school students.

In this era of NCLB and demands for greater test-based accountability, state test scores have increased in high schools, just as they have done in elementary and middle schools. But high school students show markedly less progress than students at the other two levels. Moreover, gaps between various groups of high school students have widened at the advanced achievement level in many states.

Key findings from this study include the following:

- ***Although high school students made gains in average test scores and proficiency in most of the states analyzed, fewer states showed gains at high school than at grades 4 and 8.*** More than three-fourths of these states (from 76% to 84%) made gains at the high school level in mean scores and percentages of students scoring proficient. This pattern was evident in both English language arts and math. But compared with grades 4 and 8, a smaller proportion of states had gains at high school and a larger proportion had declines.

- ***Many states show a troubling lack of progress among high school students at the advanced achievement level.*** A majority of the states with sufficient data—57% in English language arts and 63% in math—made gains in the percentage of high school students reaching the advanced level. Still, about one-third or more of the states analyzed showed *declines* in the percentages scoring advanced at high school. Declines in advanced achievement were more prevalent at high school than at grades 4 and 8.

- ***Achievement gains were smaller, on average, for high school students than for 4th and 8th graders.*** In math, for example, just 25% of the states analyzed made average annual gains of 2 percentage points or more in the percentage of high school students scoring

proficient. By comparison, 44% of the states with sufficient data had gains of this size at grade 4 and 56% had gains of this size at grade 8.

- ***States with gains for major subgroups of high school students far outnumbered states with declines, according to percentages proficient and average test scores. But at the advanced achievement level, high school trends for subgroups were less positive, especially in English language arts.*** A large majority of states analyzed (77% to 97%, depending on the subgroup and subject) posted gains in percentages proficient for African American, Asian American, Latino, Native American, and white high school students, as well as for boys and girls. A similarly large share (71% to 93%) made gains in mean scores for these groups. At the advanced level, however, smaller proportions of states analyzed showed gains for subgroups—44% to 70% of states in ELA, and 65% to 85% in math. In ELA, one-third or more of the states analyzed experienced *declines* in the percentages of students scoring advanced for all subgroups except Asian Americans.

- ***Gaps between subgroups of high school students generally narrowed at the proficient level but often widened at the advanced level.*** Gaps in percentages proficient between major racial/ethnic groups, between low-income and more economically advantaged students, and between boys and girls narrowed in a majority of the states with sufficient data. Gaps in mean scores also narrowed in a majority of these states for all groups except Native Americans. But gaps in the percentage of high school students scoring advanced *widened* more often than they narrowed, especially in math.

This report, part 5 of the series *State Test Score Trends Through 2008-09*, marks the first time CEP has focused specifically on achievement at the high school level. All of our previous reports on achievement are available at www.cep-dc.org.

Background on High School Achievement

Previous research and assessment data point to problems of low motivation to learn, high dropout rates, and lackluster achievement among high school students.

A National Research Council review of the research literature on engagement and achievement among high school students found a great deal of support for the contention that U.S. high schools are ~~–~~potent breeding grounds for alienation" (NRC, 2003, p. 18). Large percentages of high school students—upwards of 40%, depending on the study—are inattentive and disengaged from learning, exert little effort on school work, and report being bored in school. These motivation problems are far more serious in high school than in the elementary and middle grades. The research base shows that ~~–~~as students progress from elementary to middle school and then on to high school, motivation and engagement steadily decline" (NRC, 2003, p. 19). Absenteeism increases as students move through high school, according to data from the National Center for Education Statistics: 17% of 10th graders and 33% of 12th graders report skipping at least one day of school within a four-week period (NCES, 2002). And when students do exert effort, it is not so much out of intrinsic motivation but to get good grades in order to get into college (NRC, 2003).

High school achievement is also affected by outside factors, such as part-time jobs, television watching, and other distractions, and by the social and emotional characteristics of the age group. ~~–~~Adolescents are too old and too independent to follow teachers' demands out of obedience and many are too young, inexperienced, or uninformed to appreciate the value of succeeding in school," the National Research Council report noted (p. 2). In urban school districts, these problems are compounded by less-experienced teachers, overly large and impersonal schools, and poverty (NRC, 2003).

High school is also a time when many students drop out of school. There are various methods for determining dropout and graduation rates. One such method is to calculate the proportion of freshmen who graduate with a regular diploma four years after starting 9th grade. By this measure, about 74.9% of public school students in the United States in the class of 2007–08 graduated on time (Chapman, Laird, & KewalRamani, 2010). This represents a slight improvement since 2001-02, when about 72.6% of public school students graduated on time. Graduation rates are much lower, however, for African American, Latino, and Native American students. Trends in dropout rates have an impact on high school test results. Many students drop

out of high school between 9th and 10th grade (Haney et al., 2004), and they are often among the lowest-achieving. If the dropout rate rises, these students will not be in the test-taking pool, which could help to increase overall test scores. If the dropout rate falls—a positive outcome—this could contribute to a decrease or stagnation in overall test scores because more struggling students are staying in school long enough to take the high school test.

Results from the National Assessment of Educational Progress (NAEP) suggest that achievement has stagnated at the high school level. On the NAEP long-term trend assessments, the average score for 17-year-olds remained flat between 1978 and 2008 in ELA and rose only slightly in math (U.S. Department of Education, 2009a). Average scores for 9- and 13-year olds, by contrast, rose during this period in both reading and math. On the main NAEP assessments at grade 12, the average score in reading decreased somewhat from 1992 to 2009, while the average score in math increased slightly from 2005 (when there was a change in the test) to 2009 (U.S. Department of Education, 2010a). For comparison purposes, average scores for students in grades 4 and 8 increased in reading and math during these same periods (U.S. Department of Education, 2010b; 2009b).

The internationally standardized tests of the Program for International Student Assessment (PISA) provide a different but far from reassuring take on high school achievement. The PISA assessments are administered periodically by the Organization for Economic Cooperation and Development (OECD) to 15-year-olds in 65 nations. On the 2009 PISA, the overall performance of the U.S. in ELA and science did not differ significantly from the average of the OECD nations and was similar to that of many European nations, including Germany, France, and Great Britain. In math, however, U.S. 15-year-olds scored below the average of the OECD nations. Several nations, such as Canada, Australia, New Zealand, Japan, and Korea, outranked the U.S. in all subjects assessed, as did the cities of Shanghai and Hong Kong in China (OECD, 2009).

Some analysts question whether NAEP and international assessments give an accurate picture of student achievement, particularly at the high school level, because they carry no consequences for students, teachers, or schools, and thus offer no incentive for students to perform well or for teachers to emphasize these tests (NRC, 1999). NAEP, for example, is given to a sample of

students and schools, neither of which receive individual scores. State tests, by contrast, include consequences that may provide incentives for students to invest some effort in these tests. Individual students' scores are provided to parents and students, and sanctions are attached to test results for schools and districts, which may lead teachers and administrators to stress the importance of these tests. In half of the states, the high school tests used for NCLB purposes are also exit exams, meaning that students must pass them in order to receive a high school diploma. In addition, state tests are aligned to state standards for the content students are expected to learn, so these tests may match more closely what is taught in high school classrooms than do the NAEP or PISA tests.

At the same time, state tests vary enormously in content, difficulty, cut scores for various achievement levels, and other respects, and they cannot be combined to produce a national test score similar to the average score on NAEP. Nor can we simply compare or combine percentages of proficient students across states. Instead, we have sought to obtain a broad picture of progress by analyzing the general direction of achievement trends, as well as the size of achievement gains or declines, on each state's test and adding up the number of states with various trends.

State tests provide one useful piece of information about student achievement that can be considered in combination with other assessment results to obtain a more complete picture. Part 3 of this series of CEP reports examined trends in state test performance at the middle school level, specifically grade 8. We found that, contrary to the conventional wisdom about middle school achievement, more states have shown gains on state tests at grade 8 than at grade 4 or high school (CEP, 2011). In this latest report, we investigate state high school test trends to see the extent to which they corroborate the rather distressing results from NAEP and international assessments.

Study Methods

This report analyzes the performance of high school students through school year 2008-09 on the state ELA and math tests used for NCLB accountability purposes. Data for this report come from

an extensive data pool assembled by CEP with technical support from the Human Resources Research Organization. The data pool includes test results for all 50 states and the District of Columbia, broken down by student race, ethnicity, income, and gender, although not every state had sufficient data for every analysis conducted for this report. State officials have verified the accuracy of the data used in this study.

Detailed information about the methodology used for this study is available at www.cep-dc.org in the Study Methods chapter of part 2 of this series, *Slow and Uneven Progress in Narrowing Gaps* (CEP, 2010a). A few key points about methods are highlighted here.

- ***Years of comparable data.*** States were included in the trends analyses for this study only if they had three or more consecutive years of comparable test data for high school students, the minimum needed to discern a trend. Test data were not considered comparable if, during the period of analysis, a state had introduced new tests, changed its cut scores for proficient performance, or adopted other major changes in its testing program that might make year-to-year comparisons of test results inaccurate. Within these states, trends begin with results from tests administered in school year 2001-02, where available, or in the next year after that with comparable data. In all cases, trends end with data from tests administered in school year 2008-09.

- ***Number of states with sufficient data.*** Forty states (listed in the appendix to this report) and the District of Columbia had sufficient years of comparable data and sufficiently large subgroups to be included in at least some of the trends analyses in this study. In the tallies of states in this study, D.C. is counted as a state.

- ***Grades tested.*** Different states test different high school grades for NCLB accountability purposes, and sometimes the same state tests different grades in ELA and math. In ELA, 24 of the 41 states included in this study administer their high school tests for the first time in 10^{th} grade, and 12 states do so in 11^{th} grade. Two states administer end-of-course ELA exams, which are not tied to a single grade level but are given after a student completes a particular course. In math, 20 of the states analyzed administer their high

school tests for the first time in 10th grade, and 15 states do so in 11th grade. One state gives its high school math test in 9th grade, and four states give end-of-course exams in math. Many states also allow students who failed a test the first time to retake it in later grades. One should also keep in mind that the state assessments used for NCLB do not capture the performance of students who drop out before the tests are administered. The specific grade levels tested by the states included in this study are shown in the appendix. Throughout this report, we generically refer to the grade tested as "high school."

- ***Subjects tested.*** As noted earlier, state tests vary greatly in content, difficulty, scoring scales, cut scores for proficiency, and other aspects. Content differences are particularly notable at the high school level: one state may include geometry problems on the math test used for NCLB accountability while another state may assess more basic computation skills.

- ***Achievement indicators and average gains.*** For this study, we examined three indicators of high school achievement on state tests: average (mean) test scores; percentages of students scoring at or above the proficient level, which is the main indicator of progress under NCLB; and percentages scoring at or above the advanced achievement level. Gains of any size were included in the tallies of states with gains and declines. More detailed information about the size of gains and declines is discussed later in this report.

- ***Subgroups analyzed and small subgroups.*** In addition to looking at overall student achievement at the high school grade tested, we analyzed test results for major student groups, includin African American, Asian American, Latino, Native American, and white students, as well as students from low-income families (compared with those who are not low-income) and males and females. States were excluded from a particular subgroup analysis if the number of test-takers in that subgroup at the high school grade tested was too small (fewer than 500) to yield reliable results. We did not analyze trends for students with disabilities and English language learners because recent CEP reports concluded that it is difficult to obtain a clear picture of achievement for these two subgroups due to variations in policies about which students are tested, which tests they take, how their scores are counted, and other issues (CEP 2009; 2010).

- ***State-specific data.*** More detailed data for specific states can be found in the appendices for this report posted on the CEP Web site (www.cep-dc.org). In addition, interested readers can download individual profiles for each state that include data on percentages proficient and mean scores for grades 4, 8, and high school, as well as general information about state testing systems.

Overall Achievement Trends for High School Students

Of the states with sufficient data for this study, those with gains in mean scores for high school students outnumbered those with declines, as shown in **table 1**. More than three-fourths of these states—76% in English language arts and 77% in math—had mean score gains at the high school level between 2002 (or a more recent year in some states) and 2009.

Mean score trends in high school were less positive, however, than trends at grades 4 and 8, as table 1 also reveals. At grades 4 and 8, 84% of the states with sufficient data made gains in mean scores in reading, and 95% did so in math.

Table 1. Percentage *(and number)* of states showing gains, declines, or no change in mean (average) test scores, 2002–2009*

Mean score trend	Reading/English language arts			Math		
	Grade 4	*Grade 8*	*High school*	*Grade 4*	*Grade 8*	*High school*
Gain	84% *(32 states)*	84% *(32)*	76% *(25)*	95% *(36)*	95% *(36)*	77% *(27)*
Decline	11% *(4)*	13% *(5)*	18% *(6)*	5% *(2)*	3% *(1)*	17% *(6)*
No change	5% *(2)*	3% *(1)*	6% *(2)*	0% *(0)*	3% *(1)*	6% *(2)*
Number of states with data	*38*	*38*	*33*	*38*	*38*	*35*

Table reads: At grades 4 and 8, the mean state test score in reading increased in 84% of the states with sufficient data (32 of 38 states). At the high school level, the mean score in ELA increased in 76% of the states with sufficient data (25 of 33 states).

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state in the table has at least three years of comparable test data ending in 2009.

Note: Percentages do not always total 100% due to rounding.

A similar pattern of gains outnumbering declines at the high school level is also apparent when achievement is measured by percentages of students scoring at or above the proficient level on state tests, shown in **table 2.** In ELA, 84% of the states with sufficient data made gains in the percentage proficient in high school—the same as grade 4, but smaller than the 93% of states with gains at grade 8. In math, 78% of the states with sufficient data showed gains in the high school percentage proficient—a smaller share of states than at grades 4 or 8.

Table 2. Percentage *(and number)* of states showing gains, declines, or no change in the percentages of students reaching the proficient and advanced levels, 2002–2009*

Achievement level & trend	Reading/English language arts			Math		
Proficient & above	***Grade 4***	***Grade 8***	***High school***	***Grade 4***	***Grade 8***	***High school***
Gain	84% *(36 states)*	93% *(40)*	84% *(32)*	95% *(41)*	98% *(42)*	78% *(31)*
Decline	7% *(3)*	7% *(3)*	11% *(4)*	2% *(1)*	2% *(1)*	20% *(8)*
No change	9% *(4)*	0% *(0)*	5% *(2)*	2% *(1)*	0% *(0)*	3% *(1)*
Number of states with data	*43*	*43*	*38*	*43*	*43*	*40*
Advanced	***Grade 4***	***Grade 8***	***High school***	***Grade 4***	***Grade 8***	***High school***
Gain	83% *(35)*	83% *(35)*	57% *(21)*	95% *(40)*	100% *(42)*	63% *(24)*
Decline	14% *(6)*	12% *(5)*	38% *(14)*	2% *(1)*	0% *(0)*	32% *(12)*
No change	2% *(1)*	5% *(2)*	5% *(2)*	2% *(1)*	0% *(0)*	5% *(2)*
Number of states with data	*42*	*42*	*37*	*42*	*42*	*38*

Table reads: The percentage of students scoring at or above the proficient level on state reading/ELA tests increased in 84% of the states with sufficient data (36 of 43 states) at grade 4, 93% of the states (40 of 43) at grade 8, and 84% of the states (32 of 38) at the high school level.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state in the table has at least three years of comparable test data ending in 2009.

Note: Percentages do not always total 100% due to rounding.

Table 2 also shows the percentage of students reaching the advanced level of achievement on state tests. The data indicate a worrisome lack of progress at the advanced level among high school students in many states. Although a majority of the states with sufficient data made gains at the advanced level in high school, the proportion of states with gains was smaller than at grades 4 and 8. In ELA, just 57% of the states analyzed showed advanced-level gains at high school, compared with 83% of these states at grades 4 and 8. In math, 63% of the states analyzed made advanced-level gains at high school, compared with 95% of these states at grade 4 and 100% at grade 8.

In addition, achievement *declined* more often in high school than in the lower grades. This pattern can be seen in mean scores and percentages proficient but is particularly evident at the advanced achievement level, as table 2 indicates. Thirty-eight percent of the states with sufficient data showed declines in the percentage of high school students reaching the advanced level in ELA, and 32% had declines in math. At grades 4 and 8, by contrast, the share of states with declines at the advanced level for grades 4 and 8 ranged from 0% to 14%, depending on the grade and subject.

Why does progress at the high school level lag behind that at the lower grades in many states? Our data do not shed light on this question, so we can only speculate about possible reasons.

Some of the factors cited in the Background section of this report may help to explain why trends are less positive in high school than in the lower grades. These include motivation problems and increased absenteeism among high school students, as well as outside influences such as part-time jobs, social distractions, and peer pressure. Moreover, various aspects of high schools as institutions—including size, schedule, organization, and teaching methods—may not be effectively meeting the learning needs of older adolescents.

The nature of achievement problems in high school and a lack of resources to address them may also play a role. By the time they reach high school, students who have struggled with low achievement throughout their schooling may have fallen discouragingly behind. Helping them catch up may require more intensive remediation than at the lower grades and different

instructional strategies. But the resources or expertise needed to support intensive programs or tailor instruction to individual students' needs may not be available. A majority of the funds for the federal Title I program, which serves low-achieving students in low-income areas, are targeted on elementary schools, and some districts do not serve high schools at all with Title I.

The nature of high school coursework and the alignment between course content and tests could also have an impact on high school test performance. Not all high school students take the same courses at the same time. Some students start on a college preparatory track as early as middle school, while others do not take more challenging courses until high school or do not take them at all. Consequently, some students have not been taught the content needed to do well on high school tests. In addition, the content of high school tests may be less well aligned with the content taught in the grade being tested than is the case at the elementary or middle grades.

A lack of alignment between coursework and test content may also help to explain a related question—why has there been notably less progress at the *advanced* level in high school than in the earlier grades? Here again, we are left to speculate about possible reasons. Courses become more differentiated as students progress from elementary to high school. Some students may not have taken the courses needed to learn advanced-level skills, such as solving algebra and geometry problems in math or interpreting and making inferences from written passages in English language arts.

One could also conjecture that high school students who have already demonstrated proficiency may be less inclined than younger students to put forth the effort needed to score at the advanced level on state tests. High-performing high school students may be more concerned about doing well on the SAT and AP tests, which have a more direct impact on their future. In addition, students who have already demonstrated proficiency may have less incentive to strive for advanced-level scores than lower-performing students have to strive for proficient scores. Students who fall short of proficiency may have to undergo remediation, but there are no similar interventions for proficient students who fail to score advanced.

It is also possible that states, recognizing that high school is a critical end point in education, may have set more challenging cut scores for advanced achievement in high school than in the elementary or middle grades. We explored this issue by comparing the raw 2009 percentages of students scoring at the advanced level in high school with the percentages in grades 4 and 8. If the percentages were consistently lower in high school, this might suggest that cut scores are higher or that high school tests are more difficult in general. This analysis included 35 states with sufficient data at all three grades in reading and 34 states in math. We found that in a disproportionate number of states, high school students had the lowest percentage advanced among the three grades, particularly in math. In ELA, the high school percentage advanced was lowest in 15 of 35 states, or 42% of these states. In math, the high school percentage was lowest in 26 of 34 states (76%). We also looked at whether these states in which the percentage advanced was lowest in high school were more likely to have declines (or gains) in advanced achievement, but found no consistent pattern. While variations in test cut scores or difficulty may explain differences in advanced performance between high school and the lower grades, they do not explain declines over time in the percentage of students reaching the advanced levels on a particular state's high school test.

Another issue related to test design may also affect results at the advanced level. Most of the questions on state tests are aimed at distinguishing variations in performance around the middle of the achievement spectrum, where most students' scores cluster, so these tests may be a less precise measure of performance at the high end.

Finally, it is seems likely that there has been at least some decline in learning at the advanced level. In recent years, most educational reforms and interventions have focused on students who are not proficient rather than on advanced students. The highest-achieving students may be receiving less attention than they once did.

All of these explanations are speculative, however. Other factors not mentioned may contribute to these trends in high school achievement.

Size of Achievement Gains and Declines for High School Students

We also examined at the size of average annual gains and declines in the percentages of students scoring at the proficient and advanced levels. (Comparing the size of mean score gains would not be meaningful because scoring scales differ by grade and by state.) We focused on the number of states with an average annual gain (or decline) of 2 percentage points or more. An annual change of 2 percentage points represents a meaningful improvement in achievement; sustained over three years, it would amount to a cumulative gain of 6 percentage points.

Average annual gains tended to be smaller at high school than at grades 4 and 8, as shown in **table 3**. In ELA, 29% of the states analyzed made average annual gains of 2 or more percentage points in the percentage of high school students reaching proficiency. This is markedly lower than the share of states with gains of 2 or more percentage points at grade 4 (44%) and grade 8 (49%). The disparity between high school and the lower grades was even more pronounced in math; only 25% of the states analyzed showed average annual gains of 2 or more percentage points in high school proficiency, compared with 44% of states at grade 4 and 56% at grade 8.

A similar pattern was apparent at the advanced achievement level, also shown in table 3. Only 16% of the states analyzed had average gains of 2 or more points in the percentage of students scoring advanced in high school ELA. Just 13% of the states had gains of this size in high school math. A much larger proportion of states had advanced-level gains of 2 percentage points or more at grades 4 and 8.

Although more states had declines at the high school level than at grades 4 and 8, these decreases were generally not large. Only one state had an average annual decline of 2 or more percentage points at the proficient level in high school, and the same was true at the advanced level.

Table 3. Percentage *(and number)* of states with various-sized gains and declines in the percentages of students reaching the proficient and advanced levels, 2002–2009*

Average annual gain or decline in percentage points†	Reading/English language arts			Math		
Proficient & above	**Grade 4**	**Grade 8**	**High school**	**Grade 4**	**Grade 8**	**High school**
Gain of 2.0 or more	44% *(19)*	49% *(21)*	29% *(11)*	44% *(19)*	56% *(24)*	25% *(10)*
Gain of 0.1 – 1.9	40% *(17)*	44% *(19)*	55% *(21)*	51% *(22)*	42% *(18)*	53% *(21)*
Decline of 0.1 – 1.9	7% *(3)*	7% *(3)*	8% *(3)*	2% *(1)*	2% *(1)*	20% *(8)*
Decline of 2.0 or more	0% *(0)*	0% *(0)*	3% *(1)*	0% *(0)*	0% *(0)*	0% *(0)*
Number of states with data	*43*	*43*	*38*	*43*	*43*	*40*
Advanced	**Grade 4**	**Grade 8**	**High school**	**Grade 4**	**Grade 8**	**High school**
Gain of 2.0 or more	29% *(12)*	31% *(13)*	16% *(6)*	50% *(21)*	31% *(13)*	13% *(5)*
Gain of 0.1 – 1.9	55% *(23)*	52% *(22)*	41% *(15)*	45% *(19)*	69% *(29)*	50% *(19)*
Decline of 0.1 – 1.9	14% (6)	12% *(5)*	35% *(13)*	2% *(1)*	0% *(0)*	32% *(12)*
Decline of 2.0 or more	0% *(0)*	0% *(0)*	*3%* *(1)*	0% *(0)*	0% *(0)*	0% *(0)*
Number of states with data	*42*	*42*	*37*	*42*	*42*	*38*

Table reads: Forty-four percent of the states with sufficient data (19 of 43 states) had average annual gains of 2.0 percentage points or more in the percentage of students scoring at or above the proficient level in grade 4 reading. By comparison, 29% of the states with sufficient data (11 of 38 states) showed gains of 2.0 percentage points or more at the high school level.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state included in the table has at least three years of comparable test data ending in 2009.

†Not shown in the table are states with no net change in achievement.

Note: Percentages do not always total 100% due to rounding.

Trends in Subgroup Performance at the High School Level

Part 2 of this series of reports examined trends in overall achievement and achievement gaps on state tests at three grades for the major student groups tracked for NCLB accountability (CEP, 2010a). As discussed in detail in that report, all major racial/ethnic groups—African American, Asian American, Latino, Native American, and white students—have made gains since 2002 on state reading and math tests in a sizeable majority of the states with sufficient data at grades 4, 8,

and high school. This pattern was also evident for the key demographic subgroups analyzed—low-income students, boys, and girls. (Trends for students with disabilities and English language learners were not analyzed for reasons discussed in the study methods section above.)

Tables 4 and **5** below repeat the data from that earlier report on trends in mean scores and percentages proficient by subgroup. As the tables make clear, states with gains for major subgroups at the high school level far outnumbered states with declines, according to both mean scores and percentages proficient. In ELA (table 4), the percentage of the states analyzed that showed gains in mean scores for subgroups ranged from 77% for white and female students to 88% for African American students. In math (table 5), the percentage of these states with mean score gains ranged from 71% for Native American students to 93% for Latino students. In both subjects, a high proportion of states exhibited mean score and percentage proficient gains for Latino students.

Table 4. Percentage of states with various trends for subgroups at the high school level on state *English language arts* tests, 2002-2009*

Trend	African American	Asian American	Latino	Native American	White	Low-income	Female	Male
Mean scores								
Gain	88%	87%	85%	86%	77%	84%	77%	81%
Decline	12%	13%	11%	14%	16%	13%	16%	10%
No change	0%	0%	4%	0%	6%	3%	6%	10%
# of states w/ data	*25*	*23*	*27*	*14*	*31*	*31*	*31*	*31*
Proficient & above								
Gain	83%	82%	91%	82%	92%	91%	82%	84%
Decline	10%	14%	6%	12%	8%	9%	18%	16%
No change	7%	4%	3%	6%	0%	0%	0%	0%
# of states w/ data	*30*	*28*	*33*	*17*	*37*	*32*	*38*	*38*
Advanced								
Gain	55%	70%	52%	50%	54%	55%	44%	56%
Decline	34%	26%	39%	38%	43%	35%	47%	36%
No change	10%	4%	10%	13%	3%	10%	8%	8%
# of states w/ data	*29*	*27*	*31*	*16*	*35*	*31*	*36*	*36*

Table reads: On state high school ELA tests, 88% of the 25 states with sufficient data showed gains in mean scores for African American students since 2002, and 12% showed declines.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state included in the table has at least three years of comparable test data ending in 2009.

Note: Percentages do not always total 100% due to rounding.

Table 5. Percentage of states with various trends for subgroups at the high school level on state *math* tests, 2002-2009*

Trend	African American	Asian American	Latino	Native American	White	Low-income	Female	Male
Mean scores								
Gain	88%	91%	93%	71%	75%	84%	73%	73%
Decline	12%	9%	7%	29%	13%	13%	18%	15%
No change	0%	0%	0%	0%	13%	3%	9%	12%
# of states w/ data	*25*	*23*	*27*	*14*	*32*	*31*	*33*	*33*
Proficient & above								
Gain	77%	83%	97%	83%	77%	90%	80%	80%
Decline	23%	14%	3%	11%	18%	10%	20%	18%
No change	0%	3%	0%	6%	5%	0%	0%	3%
# of states w/ data	*31*	*29*	*34*	*18*	*39*	*31*	*40*	*40*
Advanced								
Gain	76%	85%	81%	69%	67%	70%	65%	65%
Decline	14%	11%	16%	31%	22%	17%	27%	27%
No change	10%	4%	3%	0%	11%	13%	8%	8%
# of states w/ data	*29*	*27*	*31*	*16*	*36*	*30*	*37*	*37*

Table reads: On state high school math tests, 88% of the 25 states with sufficient data showed gains in mean scores for African American students since 2002 and 12% showed declines.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state included in the table has at least three years of comparable test data ending in 2009.

Note: Percentages do not always total 100% due to rounding.

Tables 4 and 5 also include new analyses of high school trends by subgroup at the *advanced* achievement level. The generally positive pattern of gains for subgroups was not nearly as promising at the advanced level in ELA (table 4). For every subgroup except Asian American students, one-third or more of the states with sufficient data showed declines in ELA.

Declines at the advanced level were especially prevalent for girls in ELA. Altogether, more than half of the states analyzed showed declines (47%) or no change (8%) in the percentage of girls reaching the advanced level in ELA.

Declines in advanced achievement were less prevalent in math (table 5) than in ELA. In math, the proportion of states with declines at the advanced level ranged from 11% for Asian Americans to 31% for Native Americans.

Trends at the advanced level were most positive for Asian American students, who made gains in 70% of the states with sufficient data in ELA and 85% of these states in math.

We also looked at the size of average annual gains in the high school percentages scoring advanced for each subgroup in every state. The results are shown in **table 6.**

Table 6. Percentage *(and number)* of states with various-sized gains and declines for subgroups in the percentage of students reaching the advanced achievement level, 2002-2009*

Average annual gain or decline in percentage points†	African American	Asian American	Latino	Native American	White	Low income	Female	Male
English language arts								
Gain of 2.0 or more	7% *(2)*	26% *(7)*	10% *(3)*	13% *(2)*	20% *(7)*	16% *(5)*	14% *(5)*	22% *(8)*
Gain of 0.1 – 1.9	48% *(14)*	44% *(12)*	42% *(13)*	38% *(6)*	34% *(12)*	39% *(12)*	31% *(11)*	33% *(12)*
Decline of 0.1 – 1.9	34% *(10)*	22% *(6)*	38% *(12)*	25% *(4)*	40% *(14)*	35% *(11)*	42% *(15)*	31% *(11)*
Decline of 2.0 or more	0% *(0)*	4% *(1)*	0% *(0)*	13% *(2)*	3% *(1)*	0% *(0)*	6% *(2)*	6% *(2)*
# of states with data	*29*	*27*	*31*	*16*	*35*	*31*	*36*	*36*
Math								
Gain of 2.0 or more	7% *(2)*	33% *(9)*	13% *(4)*	6% *(1)*	19% *(7)*	7% *(2)*	16% *(6)*	14% *(5)*
Gain of 0.1 – 1.9	69% *(20)*	52% *(14)*	68% *(21)*	63% *(10)*	47% *(17)*	63% *(19)*	49% *(18)*	51% *(19)*
Decline of 0.1 – 1.9	14% *(4)*	7% *(2)*	13% *(4)*	31% *(5)*	22% *(8)*	17% *(5)*	27% *(10)*	24% *(9)*
Decline of 2.0 or more	0% *(0)*	4% *(1)*	3% *(1)*	0% *(0)*	0% *(0)*	0% *(0)*	0% *(0)*	3% *(1)*
# of states with data	*29*	*27*	*31*	*16*	*36*	*30*	*37*	*37*

Table reads: Seven percent of the states with sufficient data (2 of 29 states) had an average annual gain of 2.0 percentage points or more in the percentage of African American students reaching the advanced level in high school English language arts.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state included in the table has at least three years of comparable test data ending in 2009.

†Not shown in the table are states with no net change in achievement.

Note: Percentages do not always total 100% due to rounding.

Similar to our findings in part 3 of this series about grade 8 achievement (CEP, 2011), Asian American students tended to have the largest gains in ELA and math at the high school level. In 26% of the states with sufficient data, the percentage of Asian American students scoring at the advanced level in ELA increased at an average annual rate of 2 or more percentage points. In math, 33% of the states analyzed had gains of this size for Asian Americans. A notable share of states had average gains of at least 2 percentage points in ELA for boys (22%) and white students (20%). Smaller proportions of states had advanced-level gains of this size for African American, Latino, or Native American students in either ELA or math.

The most likely reason why gains are larger for Asian American students than for other groups at the advanced level is that the Asian subgroup generally performs at higher levels on state tests than most other racial/ethnic subgroups, including white students in some cases. Thus, a higher percentage of Asian students have scores clustered above the proficient level but somewhat below the advanced level, so that improvements in learning will boost them into the advanced level. Other factors that may contribute to higher achievement in general among Asian students are discussed in the CEP report *Policy Implications of Trends for Asian American Students* (2010b).

Declines in achievement at the advanced level were typically not large, as shown in table 6. Only one or two states, and sometimes no states, had an average annual decline of 2 or more percentage points for any subgroup.

Achievement Gaps between Subgroups of High School Students

As discussed in part 2 of this series of achievement reports (CEP, 2010a), gaps in mean scores and percentages proficient have narrowed more often than they have widened for most subgroups. In a majority of the states with sufficient data, gaps in the percentage of high school students scoring proficient narrowed for African American, Latino, Native American, and low-income students in ELA (**table 7**) and math (**table 8**), and for boys in math. (Gaps narrowed for

boys partly because achievement in some states declined for girls.) Mean scores show a similar pattern, except for Native American students. Although many states made progress, gaps at the high school level widened in a sizeable minority of states in both subjects. This is especially apparent when one looks at mean scores.

Table 7. Percentage of states in which gaps on high school *English language arts* tests narrowed, widened, or showed no net change, 2002-2009*

Achievement level & gap trend	African American/ white	Latino/ white	Native American/ white	Low-income/ not low-income	Male/ female
Mean score					
Narrowed	67%	85%	50%	66%	74%
Widened	21%	15%	43%	17%	16%
No change	13%	0%	7%	17%	6%
# of states with data	*24*	*27*	*14*	*29*	*31*
Proficient & above					
Narrowed	69%	85%	71%	65%	74%
Widened	31%	15%	24%	18%	21%
No change	0%	0%	6%	18%	5%
# of states with data	*29*	*33*	*17*	*34*	*38*
Advanced					
Narrowed	39%	45%	38%	29%	56%
Widened	57%	35%	56%	61%	39%
No change	4%	19%	6%	10%	6%
# of states with data	*28*	*31*	*16*	31	*36*

Table reads: In high school English language arts, the gap in mean scores between African American and white students narrowed in 67% of the 24 states with sufficient data, widened in 21% of these states, and showed no net change in 13%.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state included in the table has at least three years of comparable test data ending in 2009.

Note: Percentages do not always total 100% due to rounding.

Table 8. Percentage of states in which gaps on high school *math* tests narrowed, widened, or showed no net change, 2002-2009*

Achievement level & gap trend	African American/ white	Latino/ white	Native American/ white	Low-income/ not low-income
Mean scores				
Narrowed	63%	85%	50%	55%
Widened	33%	15%	50%	34%
No change	4%	0%	0%	10%
# of states with data	*24*	*27*	*14*	29
Proficient & above				
Narrowed	70%	91%	56%	76%
Widened	23%	6%	28%	15%
No change	7%	3%	17%	9%
# of states with data	*30*	*34*	*18*	34
Advanced				
Narrowed	33%	39%	31%	20%
Widened	67%	61%	56%	73%
No change	0%	0%	13%	7%
# of states with data	*27*	*31*	*16*	30

Table reads: In high school math, the gap in mean scores between African American and white students narrowed in 63% of the 24 states with sufficient data, widened in 33% of these states, and showed no net change in 4%.

*The years covered by these trends vary among states. Trends in some states begin later than 2002, although every state included in the table has at least three years of comparable test data ending in 2009.

Note: Percentages do not always total 100% due to rounding.

Tables 7 and 8 also display new data analyzed for this report on gaps between subgroups in the percentage of students reaching the advanced level on high school ELA and math tests. In many of the states with sufficient data, these advanced-level gaps widened. In high school ELA, the gaps between African American and white students, Native American and white students, and low-income and non-low-income students widened in a majority of these states. In high school math, the proportion of states with widening gaps at the advanced level ranged from 56% for the Native American-white gap to 73% for the gap between low-income and non-low-income students.

Although not shown in tables 7 and 8, Asian American students generally outperformed all other racial/ethnic subgroups, including white students, in high school math. The Asian subgroup outperformed the white subgroup in math in 25 of 27 states at the advanced level and in 22 of 29

states at the proficient level. In most of the states with sufficient data, Asian American students also had the highest mean scores and percentages proficient in high school math. In states where Asian students outperformed white students in high school math at the advanced level, the gap between these two subgroups *widened* in 72% of the states with sufficient data.

The data do not offer any reasons why there were more instances of widening gaps at the advanced level in math than in ELA. Again, we can only speculate. One possible explanation relates to the nature of coursework in high school math, which tends to follow a progression. To score at the advanced level in math, students must have had sufficient instruction in algebra, geometry, and other challenging math content by the time they are tested. Higher-achieving students may take algebra I as early as middle school to be prepared for more advanced math courses in high school, such as Advanced Placement or International Baccalaureate math. Lower-achieving students, which include disproportionate numbers of low-income and racial/ethnic minority students, may not have the opportunity or encouragement to take algebra in middle school, may require remediation before they are prepared for higher math courses, or may be tracked into a non-college-bound curriculum. For example, according to a recent NCES study, 51% of the sampled 2009 high school graduates with a parent who did not finish high school completed a ~~–b~~elow standard" or ~~–s~~tandard" curriculum (which does not include algebra I and geometry). By comparison, only 32% of high school graduates with a parent who was a college graduate took a below standard or standard curriculum (Nord et al., 2011).

It is also possible that to achieve at high levels in math, students must master a specific body of knowledge and skills, often in a particular order, before they can understand more advanced math concepts. One could speculate that English language arts is less fixed and somewhat less dependent on prior coursework.

Some of the rationale behind the widening gaps at the advanced achievement level may be statistical. As explained in part 3 of this series dealing with grade 8 achievement (CEP, 2011), relatively fewer African American, Latino, or low-income students have test scores clustered just below the advanced level compared with white or non-low-income students. So, when mean scores go up for both groups, a smaller percentage of African American, Latino, or low-income

students than of white or non-low-income students will move into the advanced level. Another caution noted in our grade 8 report also holds true at the high school level; namely, that states vary widely in the percentage of their students reaching the advanced level. For example, in a few states, more than half of the tested population scored at the advanced level. This is more likely due to easier tests or cut scores than to differences in actual achievement.

Conclusion

As discussed above, several states have experienced declines rather than gains on their state tests among high school students—more so than at grades 4 and 8. This is especially apparent at the advanced achievement level. In addition, the size of achievement gains at the high school grades is smaller than at grades 4 and 8. Finally, gaps between key student subgroups have widened in many states, particularly at the advanced level in math.

These findings give some credence to the widely held perception that achievement is lagging in high school. When considered in conjunction with findings from other national and international studies of high school achievement, our findings suggest a need for greater attention to many aspects of high school education, including student motivation, school organization, and effective instructional practices. They also indicate a need to focus greater attention on meeting the needs of high-achieving as well as low-achieving high school students and on narrowing achievement gaps in high school.

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Appendix

High school grades tested for NCLB accountability in 2008-09 for states included in this study

State	Grade tested in ELA*	Grade tested in math*
Alabama	11	11
Alaska	10	10
Arizona	10	10
Arkansas	11	End-of-course exams, algebra I & geometry
California	10	10
Colorado	10	10
Connecticut	10	10
Delaware	10	10
District of Columbia	10	10
Florida	10	10
Georgia	NA	11
Hawaii	10	10
Idaho	10	10
Illinois	11	11
Iowa	11	11
Kansas	Computerized assessments, grade varies	Computerized assessments, grade varies
Kentucky	10	11
Louisiana	10	10
Maine	11	11
Massachusetts	10	10
Michigan	11	11
Minnesota	10	11
Montana	10	10
Nebraska	11	11
Nevada	10	10
New Jersey	11	11
New Mexico	11	11
North Dakota	11	11
Ohio	10	10
Oklahoma	NA	End-of-instruction test in algebra I
Oregon	10	10
Pennsylvania	11	11
South Carolina	10	10
South Dakota	NA	11
Tennessee	10	9
Texas	10	10
Utah	10	NA
Virginia	End-of-course exams, grade varies	End-of-course exams, grade varies
Washington	10	10
Wisconsin	10	10
Wyoming	11	11

NA = State did not have sufficient years of comparable high school test data in this subject through 2009 or did not provide data for this study.

*Several states allow students to retake high school tests after the first test administration. Some states count only scores from the first administration for NCLB accountability purposes, while other states have received permission from the U.S. Department of Education to count scores from retests that meet certain conditions.

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