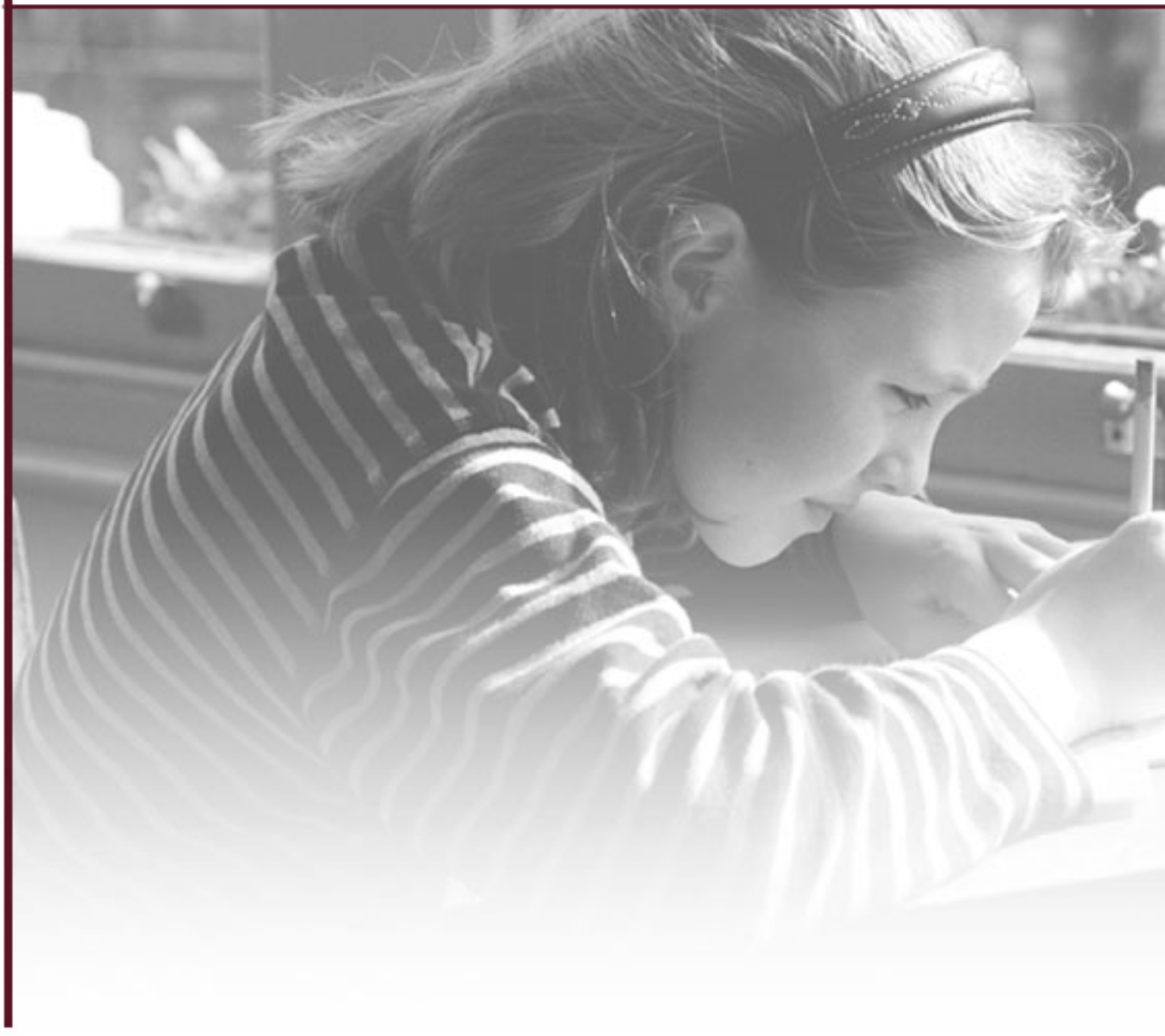
Section 2

Learner Outcomes



Contents

Summary: Learner Outcomes

At the first Education Summit in 1989, President Bush and the Nation's governors established a series of educational goals for 2000. These Goals 2000 subsequently became the basis of major federal education legislation and a benchmark against which we continue to measure America's progress in educating our students. Two of these goals declared that "U.S. students will be the first in the world in mathematics and science achievement" and "all students will leave grades 4, 8, and 12 having demonstrated competency over challenging subject matter . . . (and) . . . learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our Nation's modern economy" (Bush 1990). As the data in *The Condition of Education 2000* indicate, the United States has not yet achieved these goals, but some progress has been made.

Academic Outcomes

How students perform academically is key to their educational success. The federal government and other national and international organizations sponsor assessments to measure learning outcomes. The results of these assessments sometimes show mixed results and can be interpreted differently, depending on the definitions of academic success used. For example, some international assessments measure performance by examining student achievement relative to that of their peers in other countries. National assessments, in contrast, often evaluate performance relative to predefined standards. Assessments that measure academic performance over several years can judge academic success by examining how much students' average scores improve over time.

International assessments

The results of the Third International Mathematics and Science Study (TIMSS) were released in 1996. They showed that, on average, 8th-grade students in the United States performed lower than the international average in mathematics and higher than the international average in science (*Indicator 18* and NCES 97–198). The results for U.S. 4th-graders were better: they scored higher than the international average in both mathematics and science (*Indicator 18* and NCES 97–255). For U.S. 12th-graders, however, the average mathematics and science scores were lower than those of students in their final year of secondary school in the majority of other countries (*Indicator 18* and NCES 98–049). Further, on the assessments in physics and advanced mathematics, the United States was among the lowest scoring countries (*Indicator 19*).

The TIMSS results raised concerns about the quality of education in the United States, especially at the secondary level, as expressed in several books and commissioned reports (Boyer and the Carnegie Foundation for the Advancement of Teaching 1983; Powell, Farrar, and Cohen 1985). These results also renewed concerns about the competitiveness of the United States in the global economy (National Commission on Excellence in Education 1983).

Standards-based assessments

The National Assessment of Educational Progress (NAEP) measures American students' performance in a number of subjects (see *Supplemental Note 5*). In mathematics, for example, about one-quarter of students in grade 8 and about one-fifth of students in grades 4 and 12 performed at or above the Proficient level of achievement in 1996 (*Indicator 15*). In reading, about one-third of 4th- and 8th-grade students and 40 percent of 12th-grade students performed at or above the Proficent level in 1998 (*Indicator 13*). In writing, the majority of 4th-, 8th-, and 12th-grade students wrote at the Basic level, and one-quarter wrote at the Proficient level (*Indicator 14*).

Summary: Learner Outcomes

The achievement levels used in these NAEP results are established by the National Assessment Governing Board (NAGB) and are modified periodically to reflect the latest advances in educational curricula and practices. The use of these achievement levels is a developing process and is subject to various interpretations. While the achievement levels are useful for reporting on patterns in the educational achievement of students in the United States, they should continue to be considered developmental and interpreted with caution.

Change Over Time

Another component of NAEP, the long-term trend assessment, has been measuring student performance regularly for several decades with assessment instruments that have not changed during that time. Although these tests do not reflect the latest educational practices, they do permit tracking progress over long periods of time. These assessments show that average scores have improved for all age groups between 1978 and 1996 in mathematics (*Indicator 18, The Condition of Education 1998*) and between 1982 and 1996 in science (*Indicator 1, The Condition of Education 1999*). In reading, average scores increased between 1971 and 1996 for 9- and 13-year-olds and remained stable for 17-year-olds (*Indicator 4, The Condition of Education 1999*).

Another trend that can be examined using the NAEP long-term trend results is the achievement gap between white and nonwhite students. This gap has been the focus of considerable attention among those concerned with equity in the quality of American education. For many people, equity is a more important benchmark against which to measure educational success than is comparing the performance with that of students in other countries (Jencks and Phillips 1998). Some researchers have argued that one of the reasons that U.S. students perform poorly on international assessments may be because resources are inequitably distributed to schools, resulting in large variations in achievement (Berliner and Biddle 1995). For example, during the 1995–96 school year, school districts with less than 5 percent of children living below the poverty level spent an average of $9,143 per pupil, compared with $6,791 per pupil spent by districts with more than 20 percent of children living below the poverty level (*Indicator 61*).

The NAEP long-term trend data show that the achievement gap between white and black students has decreased over the past 30 years in reading (*Indicator 17*). Despite such gains in the achievement of black students, however, the average scores of black students remain lower than those of whites at all ages tested. This gap exists when children first enter school (*Indicator 11*). The U.S. Department of Education's Early Childhood Longitudinal Study found that, in fall 1998, white kindergartners were more likely than their black peers to demonstrate proficiency in reading and mathematical skills.

Social and Cultural Outcomes

Another aspect of learning outcomes is how much American students learn about their country and what it means to be a good citizen. Recent research has shown that college students and adults demonstrate little interest in politics or activism and a limited knowledge of basic civics-related subjects. However, Americans still believe that preparing students for citizenship is one of the primary goals of education (Branson 1994). NAEP recently released the results of the 1998 civics assessment, which showed that approximately two-thirds of the students tested in grades 4, 8, and 12 scored at or above the basic level in civics, and about one-quarter of the students scored at or above the proficient level (*Indicator 20*).

Summary: Learner Outcomes

Beyond students' knowledge of civic issues is their actual participation in civic activities. Education may instill in students a sense of responsibility to their country and desire to participate actively in public affairs. The youth component of the National Household Education Survey (NHES) showed that, in 1999, 49 percent of 6th–12th-grade students reported that they either read national news, watched or listened to news on radio or television, or discussed national news with adults almost daily (*Indicator 21*). In addition, students who had taken a course in the current or prior school year that required them to pay attention to government, politics, or national issues were more likely to participate in any of these civic activities on a daily basis than those who had not taken such a course.

Voting behavior is another civic activity that influences the social environment. In the 1996 and 1998 national elections, among those ages 25–44, college graduates were almost twice as likely as their peers who had graduated high school to vote (*Indicator 22*). High school dropouts of the same age were about half as likely as their peers who had graduated to vote. These results suggest that education may encourage students to become active participants in their political and social communities.

Economic Outcomes

Finally, many educators, researchers, and policymakers agree that education is strongly tied to the economy's performance through the productivity of its workforce (Murnane and Levy 1996). An effective education system should teach future workers skills that expand their capacity to perform tasks, use productive technologies, adapt easily to new tasks or to changes in old tasks, and work effectively in teams (NCES 97–269).

At an individual level, worker productivity is often measured by the wages that employers are willing to pay, and education is often a key predictor of wage level, with higher relative levels of education leading to higher wages. The earnings differential between young adults with different levels of educational attainment demonstrates this point. For example, in 1998, when comparing the annual earnings of those who completed a 4-year college degree with the earnings of those who obtained no more than a high school diploma or GED, male and female college graduates earned 56 and 100 percent more, respectively (*Indicator 23*). Further, since 1980, the percentage difference between the earnings of young adults who completed at least a bachelor's degree and their counterparts who completed no more than high school has increased.

Early Childhood Outcomes

Kindergartners' Skills and Proficiency in Reading and Mathematics

As children enter kindergarten for the first time, they are acquiring the basic skills associated with the development of early reading and mathematical literacy, such as the recognition of letters and numbers.

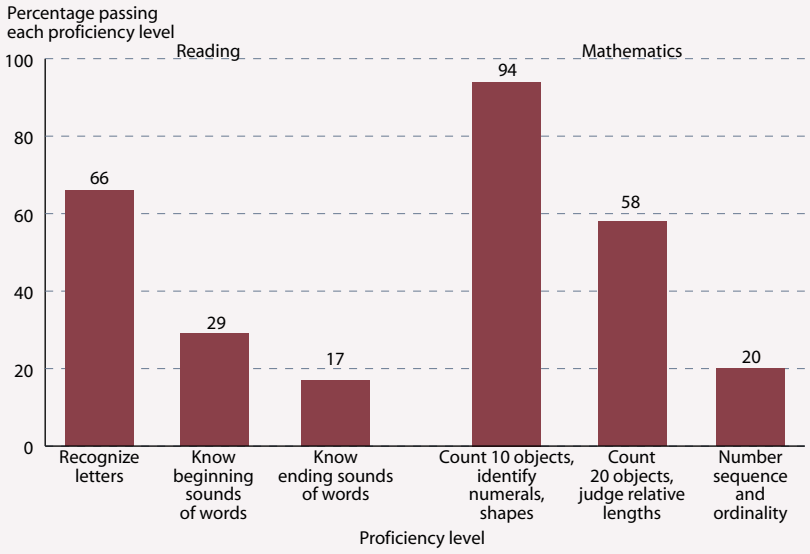
The proficiency children demonstrate in reading and mathematics is vital to their learning experiences. In kindergarten, children further develop their emergent literacy skills, such as recognizing letters and the beginning and ending sounds of words. Children in kindergarten also develop mathematical skills and knowledge related to numbers, shapes, the sequence of numbers (e.g., 2, 4, 6, 8…) and the comparison of objects (e.g., which one is longer, larger, or heavier).

In fall 1998, as children entered kindergarten, 66 percent recognized letters, 29 percent recognized beginning of word sounds, and 17 percent recognized ending of word sounds. Girls were more likely than boys to achieve each of these proficiency levels. In addition, children whose mothers have higher levels of education achieved these proficiency levels at higher rates than children whose mothers have less education. White and Asian children are more likely to achieve each level than are black or Hispanic children (see supplemental table 11-1).

Among children who entered kindergarten for the first time in 1998, 94 percent recognized basic (single-digit) numbers and shapes. In addition, 58 percent recognized numbers greater than single digits, could count beyond 10, and could use nonstandard units of length to compare objects. Finally, about 20 percent could sequence numbers (e.g., 2, 4, 6, 8, 10), read two-digit numerals, identify the ordinal position of an object (e.g., the third flower in a row of flowers), and solve basic word problems.

The differences in mathematics proficiency by mother's education and children's race-ethnicity are similar to those in reading. In mathematics, boys and girls are more evenly matched, with girls having a slight advantage in recognizing basic numbers and shapes.

LEARNER OUTCOMES: Reading and mathematics proficiency of first-time kindergartners: Fall 1998



NOTE: Based on those assessed in English. Excludes 19 percent of Asian and 30 percent of Hispanic children.

SOURCE: U.S. Department of Education, NCES. Early Childhood Longitudinal Study, "Kindergarten Class of 1998–99," Fall 1998.

FOR MORE INFORMATION:
Supplemental Note 3
Supplemental Table 11-1
NCES 2000–070

Early Childhood Outcomes

Kindergarteners' Overall Reading and Mathematics Performance

Upon entering kindergarten, children's reading and mathematics skills and knowledge differ by characteristics such as their sex, race-ethnicity, and mother's education.

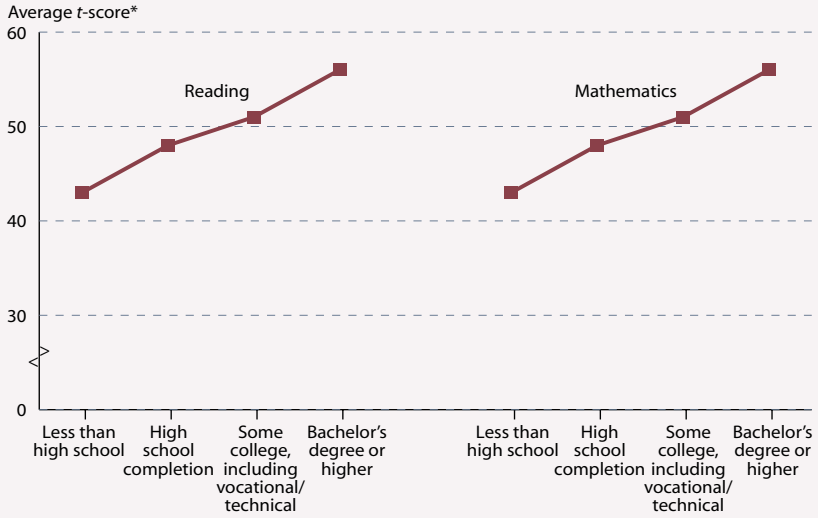
Children's cognitive skills and knowledge are thought to be core ingredients for success in school. Researchers have conceived of cognitive development as an extended set of multidimensional skills (e.g., reading and mathematics). Children's reading and mathematical knowledge and skills play an important role in their chances for scholastic success (Kagan, Moore, and Bredekamp 1995).

Among first-time kindergartners in 1998, children's reading skills and knowledge differed by their sex, with girls performing slightly better than boys. Overall, however, girls and boys performed similarly in mathematics.

Children's average performance in reading and mathematics increased with the level of their mothers' education. Nonetheless, some children whose mothers had less than a high school education showed a high level of reading and mathematical skills and knowledge (6 percent scored in the highest quartile in reading and 7 percent in the highest quartile in mathematics) (see supplemental tables 12-1 and 12-2).

White and Asian children were more likely to score in the highest quartile than black or Hispanic children in reading and mathematics. Still, many minority children performed above the average for all children. In reading, 15 percent of black children and 15 percent of Hispanic children scored in the highest quartile.

LEARNER OUTCOMES: Average reading and mathematics performance of first-time kindergartners, by mother's highest education level: Fall 1998



* *t*-scores normalize the actual distribution to an average of 50 and a standard deviation of 10.

NOTE: Based on those assessed in English. Excludes 19 percent of Asian and 30 percent of Hispanic children.

SOURCE: U.S. Department of Education, NCES. Early Childhood Longitudinal Study, "Kindergarten Class of 1998–99," Fall 1998.

FOR MORE INFORMATION:

Supplemental Note 3

Supplemental Tables 12-1, 12-2

Kagan, Moore, and Bredekamp 1995

NCES 2000-070

Academic Outcomes

Reading Performance of Students in Grades 4, 8, and 12

Reading scores for 8th-grade students increased between 1992 and 1998, while scores for 4th- and 12th-grade students remained unchanged. Females outscored males, and white students outscored black and Hispanic students at all three grade levels.

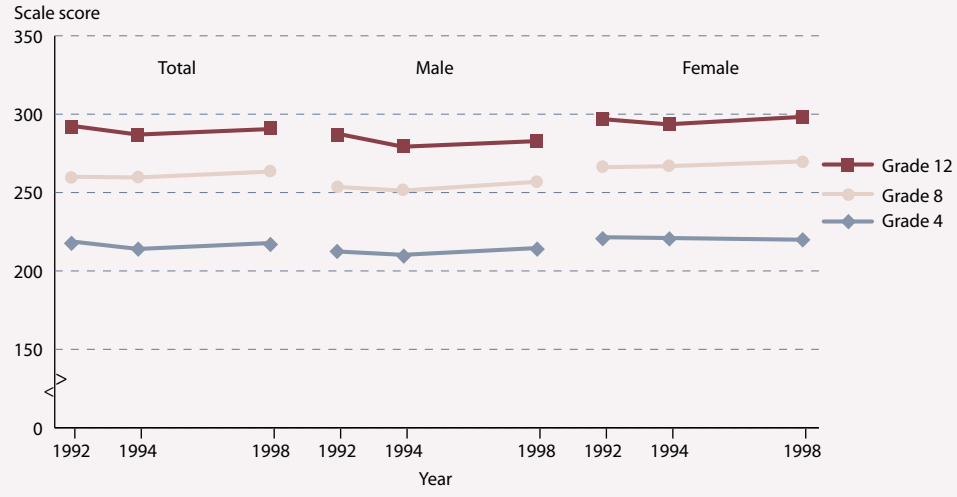
Reading performance improved between 1992 and 1998 at the 8th-grade level but remained the same at the 4th- and 12th-grade levels. For 12th graders, average reading scores decreased between 1992 and 1994 but returned to about their original level in 1998.

Changes in the percentages of students performing at different achievement levels followed similar patterns: the percentage of students scoring at or above the Proficient level between 1992 and 1998 increased for 8th-graders and remained unchanged for 4th- and 12th-graders (see supplemental table 13-1). In 1998, about one-third of 4th- and 8th-grade students and 40 percent and 12th-grade students performed at or above the Proficient level (see supplemental table 13-2).

In addition, little change occurred in the performance of population subgroups. In all three years, for example, females outperformed males in reading at the 4th-, 8th-, and 12th-grade levels on average. Among 4th-grade males, however, average scores increased from 1994 to 1998. The average scores of 4th-grade females remained stable over the same period.

White students outperformed their black and Hispanic classmates at each grade level in each year. Average reading scores for black students in grades 4 and 8 increased between 1994 and 1998, as did average reading scores for 12th-grade Hispanic students. The gap in scores between black and white students remained about the same between 1992 and 1998 for all grades (see supplemental table 13-1).

READING PERFORMANCE: Average reading performance, by grade and sex: 1992, 1994, and 1998



SOURCE: U.S. Department of Education, NCES. *NAEP 1998 Reading, A Report Card for the Nation and the States* (NCES 1999–500), 1999.

FOR MORE INFORMATION:
Supplemental Notes 3, 6
Supplemental Tables 13-1, 13-2

Academic Outcomes

Writing Performance of Students in Grades 4, 8, and 12

The results of the 1998 National Assessment of Educational Progress indicate that most students are not proficient writers.

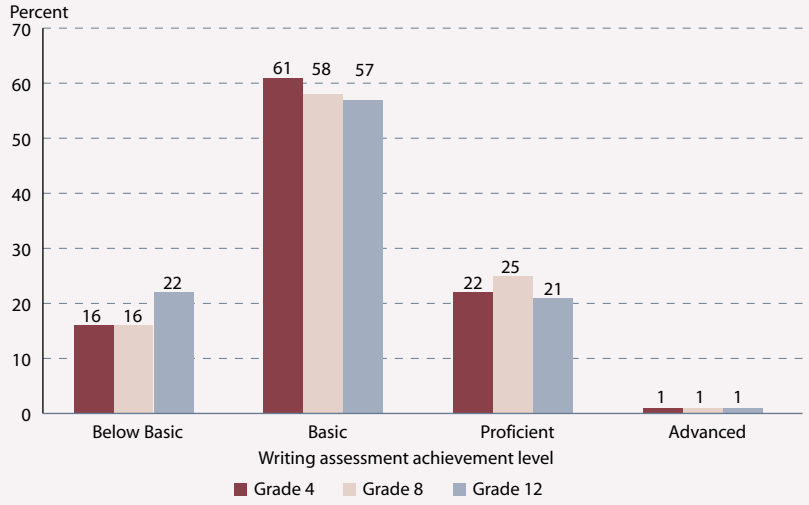
The 1998 National Assessment of Educational Progress (NAEP) in writing provides a portrait of student writing performance at the end of the 20th century and suggests how well today's students will be able to communicate in the future.

The results of the assessment indicate that most students exhibited at best only partial mastery of the requisite knowledge and skills. The majority of 4th-, 8th-, and 12th-grade students wrote at the Basic level. About one-quarter of students in each grade could write at the Proficient level, and 1 percent of students could write at the Advanced level.

Although performance on the writing assessment was low for the majority of most groups of students, some subgroups were more likely than others to score at the higher levels. Females, for example, were more likely than males to score at the Advanced and Proficient levels and less likely than males to score below the Basic level at all three grade levels. Differences among racial-ethnic groups existed as well. Whites were more likely to score at the Proficient level and less likely to score below the Basic level when compared with black, Hispanic, and American Indian students at all three grade levels (see supplemental table 14-1).

The NAEP writing results also showed certain home and school factors to be positively associated with performance on the assessment. For example, at all three grades, students whose teacher always or sometimes talked to them about their writing have higher scale scores than their peers whose teachers never talked to them about their writing. Similarly, for students in grades 8 and 12, students who were always asked to write more than one draft of a paper had higher average scale scores than did their peers who were sometimes or never asked to do so. The results also showed that, for all three grades, the more frequently students discussed their studies with someone at home, the better their writing scores (see supplemental table 14-2).

WRITING PERFORMANCE: Percentage distribution of students according to the NAEP writing assessment achievement levels, by grade: 1998



NOTE: Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, NCES. *NAEP 1998 Writing: A Report Card for the Nation and the States* (NCES 1999–462) , 1999.

FOR MORE INFORMATION:

Supplemental Notes 3, 6

Supplemental Tables 14-1, 14-2

Academic Outcomes

Mathematics Performance of Students in Grades 4, 8, and 12

Mathematics performance improved steadily at all grade levels between 1990 and 1996. For students in the 12th grade, scores for females reached the same level as those of their male counterparts.

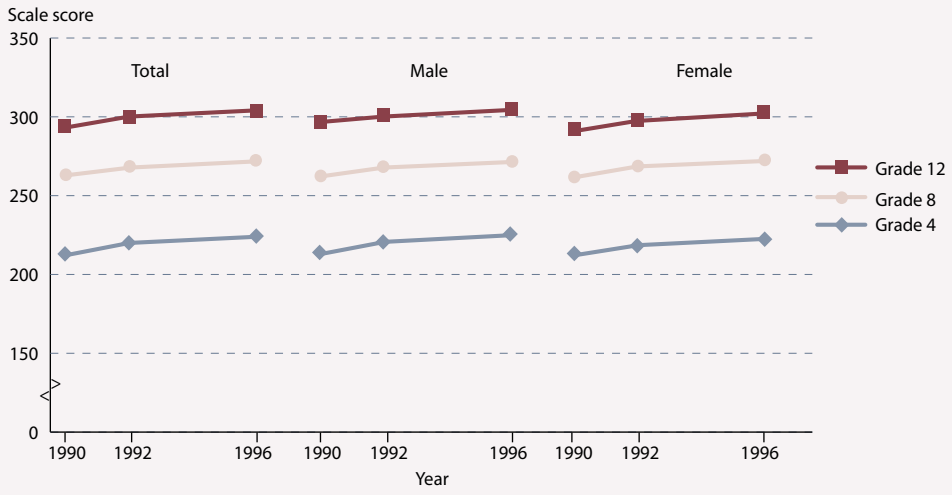
During the 1990s, students demonstrated a continuous increase in mathematics performance. Overall, average mathematics scale scores improved between 1990 and 1992 and between 1992 and 1996 in grades 4, 8, and 12. Similarly, the percentage of students scoring at or above the Proficient achievement level increased between 1990 and 1996 at all three grade levels (see supplemental table 15-1). In 1996, about one-quarter of students in 8th grade and about one-fifth of students in 4th and 12th grades performed at or above Proficient level of achievement.

Sex differences in mathematics performance changed in the 1990s. While both male and female 12th-graders improved between 1990 and 1996, males outperformed females in 1990 and 1992, but in 1996 males and females had similar average scores. For 4th-grade students, however, the opposite trend was true. In 1990 and 1992, male and female 4th-graders, on average, scored about the same, while in 1996, 4th-grade males scored higher than their female counterparts. For 8th-graders, there was no difference in scores between the genders in 1990, 1992, and 1996.

Despite an overall improvement in mathematics scores, white students have consistently outperformed their black and Hispanic classmates. Average scores for white students were higher than those for black and Hispanic students at all three grade levels in 1990, 1992, and 1996. The size of these performance gaps in scores between black or Hispanic and white students also remained similar between 1990 and 1996 (see supplemental table 15-2).

SOURCE: U.S. Department of Education, NCES. *NAEP 1996 Mathematics Report Card for the Nation and the States: Findings from the National Assessment of Educational Progress* (NCES 97–448), 1997.

MATHEMATICS PERFORMANCE: Average mathematics performance, by grade and sex: 1990, 1992, and 1996



FOR MORE INFORMATION:
Supplemental Notes 3, 6
Supplemental Tables 15-1, 15-2

Academic Outcomes

High Performance in Mathematics and Science

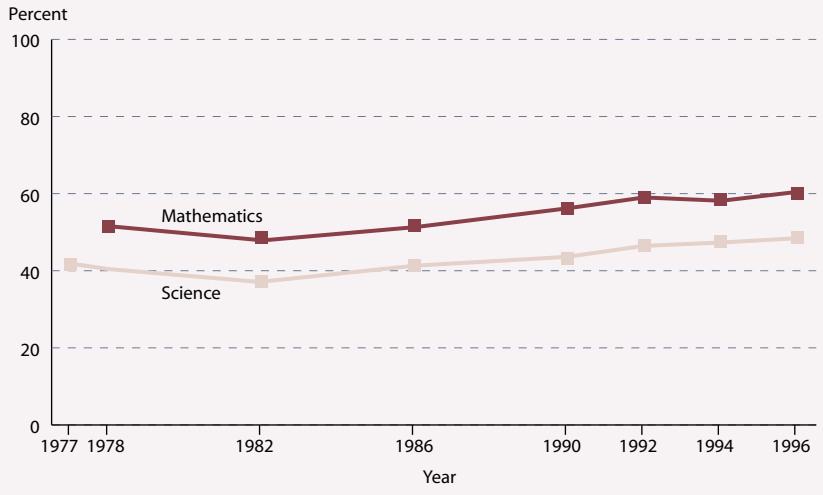
The percentage of 17-year-old students scoring at or above 300 on the National Assessment of Educational Progress (NAEP) in mathematics and science has increased over the past 20 years.

Scores of 300 or higher on NAEP long-term trend assessments (see *Supplemental Note 6*) indicate high performance in a subject area and demonstrate a student's ability to think critically and apply reasoning, analytical, and problem-solving skills. A score of 300 on the mathematics assessment indicates both the ability to perform moderately advanced numeric procedures and logical reasoning, and a developing understanding of number systems. For science, a score of 300 represents the ability to analyze scientific procedures and data and a growing understanding of principles from the physical sciences.

The long-term trend version of NAEP offers the ability to measure change over time. These data show that, for both mathematics and science, a greater percentage of 17-year-old students scored at or above 300 in 1996 than in 1978 (for mathematics) or 1977 (for science). For mathematics, the percentage of students scoring at or above 300 remained stable from 1978 to 1982, was greater in 1990 than in 1982, and remained stable again between 1990 and 1996. For science, the percentage of students scoring at 300 or above decreased between 1977 and 1982, but then increased between 1982 and 1996.

Trends in high mathematics performance were slightly different for females than males. In 1978, males were slightly more likely than females to score at or above 300 on the mathematics assessments; in 1996, males and females were as likely to score at or above 300. No such change occurred for the science assessments; males were more likely than females to score at or above 300 in 1977 and 1996 (see supplemental table 16-1).

HIGH PERFORMANCE: Percentage of 17-year-old students scoring at or above 300 on the NAEP mathematics and science assessments: 1977–96



SOURCE: U.S. Department of Education, NCES. *National Assessment of Educational Progress, NAEP 1996 Trends in Academic Progress* (NCES 2000–499), 2000 (forthcoming).

FOR MORE INFORMATION:
Supplemental Note 6
Supplemental Table 16-1

Academic Outcomes

Trends in the Achievement Gap in Reading Between White and Black Students

While white students continue to outperform black students in reading, this achievement gap decreased between the early 1970s and the late 1980s. Since the late 1980s, however, the gap has remained relatively stable.

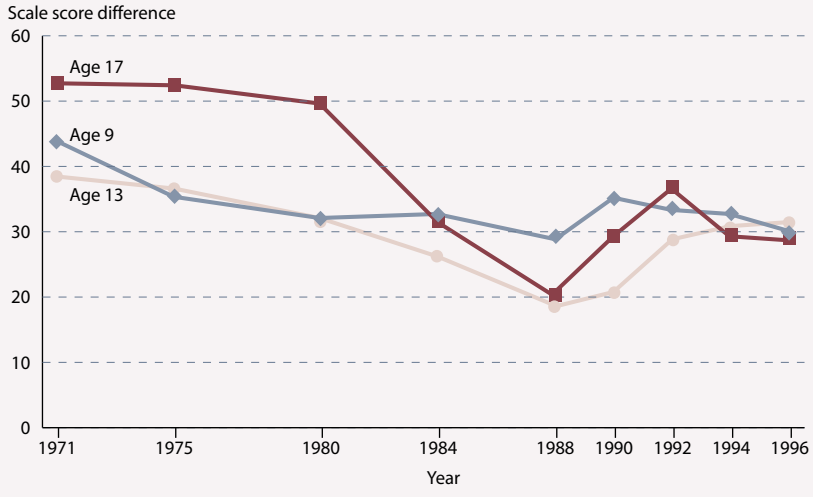
The National Assessment of Educational Progress (NAEP) has assessed trends in students' reading performance since the early 1970s. NAEP thus provides a picture of how student performance in reading has changed over time, specifically among students of different ages and racial-ethnic groups. One trend in particular that can be analyzed with these data is the achievement gap between white and black students. This gap has been the focus of considerable attention among those concerned with equity in the quality of education that is provided to America's students.

Since 1971, black 9-, 13-, and 17-year-olds have had lower reading scores, on average, than those of their white peers (see supplemental table 17-1). However, the average difference between black and white students' scores has changed over time. There has been an overall narrowing in this achievement gap since 1971, most of which is due to decreases that occurred before 1988. For example, between 1971 and 1988, the black-white score gap decreased for 13- and 17-year-olds. Between 1988 and 1996, however, the gap increased for 13-year-olds and remained relatively stable for 17-year-olds.

One indication of the meaning of these score changes for the achievement of black students is that in 1971 the average reading score of black 17-year-olds (239) was below that of white 13-year-olds (261). By 1988 the average reading score of black 17-year-olds (274) was between that of white 17-year-olds (295) and white 13-year-olds (261).

SOURCE: U.S. Department of Education, NCES. *NAEP 1996 Trends in Academic Progress* (NCES 2000–499), 2000 (forthcoming).

READING ACHIEVEMENT GAP: Difference in average reading performance of 9-, 13-, and 17-year-old white and black students: 1971–96



FOR MORE INFORMATION:
Supplemental Notes 3, 6
Supplemental Table 17-1

Academic Outcomes

International Comparisons of Student Performance in Mathematics

The average 4th-grade student in the United States scored above the international average in mathematics; students in the 8th and 12th grades scored below the international average.

The Third International Mathematics and Science Study (TIMSS) is the largest international comparative study of educational achievement, assessing performance in mathematics and science of more than half a million students in 41 countries. In mathematics, on average, U.S. students at the 4th-grade level scored above the international average in mathematics, performed above their peers in 12 countries, and scored lower than their peers in 7 countries.

Conversely, both 8th- and 12th-grade students in the United States scored below the international averages in mathematics. Of the 41 nations participating at the 8th-grade level, the average student in the United States scored higher than their peers in seven countries and was outperformed by students in 20 countries. Of the 21 nations participating at the final year of secondary school level, U.S. students scored, on average, below the average student in 14 other countries and above the average student in two other countries.

Sex gaps in mathematics performance were apparent in some of the participating countries. At the 4th-grade level, male students outperformed their female classmates in 3 of the 25 countries for which data are available. At the 8th-grade level, male students outperformed their female counterparts in 8 of the 39 countries for which data are available. In their final year of secondary school, however, males outperformed females in mathematics in 18 of the 21 participating countries. In the United States, males and females scored similarly at all three grade levels. Female students did not score higher than male students at any grade level in any country (see supplemental table 18-1).

MATHEMATICS PERFORMANCE: Average mathematics performance of 4th-grade[1] students: 1995

Average score relative to U.S.	Country	
Significantly higher	Austria[2]	Korea
	Czech Republic	Netherlands[2]
	Hong Kong	Singapore
	Japan	
Not significantly different	Australia[2]	Ireland
	Canada	Israel[2]
	Hungary[2]	Slovenia[2]
Significantly lower	Cyprus	Latvia (LSS)[2]
	England	New Zealand
	Greece	Norway
	Iceland	Portugal
	International average	Scotland
	Iran, Islamic Republic	Thailand[2]
	Kuwait[2]	

[1] In most countries. See *Supplemental Note 7* for more information.

[2] Did not satisfy one or more of the sampling or other guidelines. In the final year of secondary school, this included the United States. Latvia is designated LSS for Latvian-speaking schools only. See *Supplemental Note 7* for more information.

SOURCES: U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Fourth-Grade Mathematics and Science Achievement in International Context* (NCES 97–255), 1997; U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Eighth-Grade Mathematics and Science Teaching, Learning, Curriculum, and Achievement in International Context* (NCES 97–198), 1996; U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Twelfth-Grade Mathematics and Science Achievement in International Context* (NCES 98–049), 1998.

FOR MORE INFORMATION:

Supplemental Note 7

Supplemental Table 18-1

MATHEMATICS PERFORMANCE: Average mathematics performance of 8th-grade[1] students: 1995

Average score relative to U.S.	Country	
Significantly higher	Australia[2]	Ireland
	Austria[2]	Japan
	Belgium (Flemish)	Korea
	Belgium (French)[2]	Netherlands[2]
	Bulgaria[2]	Russian Federation
	Canada	Singapore
	Czech Republic	Slovak Republic
	France	Slovenia[2]
	Hong Kong	Sweden
	Hungary	Switzerland
	International average	
Not significantly different	Denmark[2]	New Zealand
	England	Norway
	Germany[2]	Romania[2]
	Greece[2]	Scotland[2]
	Iceland	Spain
	Israel[2]	Thailand[2]
	Latvia (LSS)	
Significantly lower	Colombia[2]	Lithuania
	Cyprus	Portugal
	Iran, Islamic Republic	South Africa[2]
	Kuwait[2]	

MATHEMATICS PERFORMANCE: Average mathematics performance of students in their final year of secondary school: 1995

Average score relative to U.S.	Country	
Significantly higher	Australia[2]	*International average*
	Austria[2]	Netherlands[2]
	Canada[2]	New Zealand
	Denmark[2]	Norway[2]
	France[2]	Slovenia[2]
	Germany[2]	Sweden
	Hungary	Switzerland
	Iceland[2]	
Not significantly different	Czech Republic	Lithuania
	Italy[2]	Russian Federation
Significantly lower	Cyprus[2]	South Africa[2]

[1] In most countries. See *Supplemental Note 7* for more information.

[2] Did not satisfy one or more of the sampling or other guidelines. In the final year of secondary school, this included the United States. Latvia is designated LSS for Latvian-speaking schools only. See *Supplemental Note 7* for more information.

SOURCES: U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Fourth-Grade Mathematics and Science Achievement in International Context* (NCES 97–255), 1997; U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Eighth-Grade Mathematics and Science Teaching, Learning, Curriculum, and Achievement in International Context* (NCES 97–198), 1996; U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Twelfth-Grade Mathematics and Science Achievement in International Context* (NCES 98–049), 1998.

FOR MORE INFORMATION:
Supplemental Note 7
Supplemental Table 18-1

Academic Outcomes

Physics and Advanced Mathematics Performance

Twelfth-grade students in the United States who participated in international assessments of physics and advanced mathematics scored lower than students in their final year of secondary school in the majority of participating countries.

The physics and advanced mathematics component of the Third International Mathematics and Science Study (TIMSS) tested a subgroup of students who had taken courses in these advanced subjects. The results showed that U.S. students in 12th grade who had taken courses in physics or advanced mathematics did not perform as well, on average, as their counterparts in most other countries who had taken similar courses. In physics, the average score of U.S. students was lower than that of students in every participating country except Austria. In advanced mathematics, U.S. students scored lower than students in 11 of the 16 participating countries, the exceptions being Italy, the Czech Republic, Germany, and Austria.

Sex gaps were also apparent within most countries. Male students outperformed their female counterparts in 11 of the 16 participating countries in advanced mathematics and in all but one of the countries in physics. Male students in the United States outscored their female peers in both advanced mathematics and physics. In neither subject and in no country did females outperform males (see supplemental table 19-1).

INTERNATIONAL COMPARISONS: Average physics and advanced mathematics performance scores for students in their final year of secondary school, by country: 1995

Physics		Average score relative to U.S.	Advanced mathematics	
Australia*	Latvia		Australia*	Russian Federation
Canada	Norway		Canada	Slovenia*
Cyprus	Russian		Cyprus	Sweden
Czech Republic	Federation	*Significantly*	Denmark*	Switzerland
Denmark*	Slovenia*	*higher*	France	
France	Sweden		Greece	
Germany	Switzerland		*International average*	
Greece			Lithuania	
International average				
Austria*		*Not significantly different*	Austria*	Germany
			Czech Republic	Italy*
None		*Significantly lower*	*None*	

* Did not satisfy one or more of sampling or other guidelines. In both subjects, this included the United States.

SOURCE: U.S. Department of Education, NCES. *Pursuing Excellence: A Study of U.S. Twelfth-Grade Mathematics and Science Achievement in International Context* (NCES 98–049), 1998.

FOR MORE INFORMATION:
Supplemental Note 7
Supplemental Table 19-1

Social and Cultural Behaviors

Civics Performance of Students

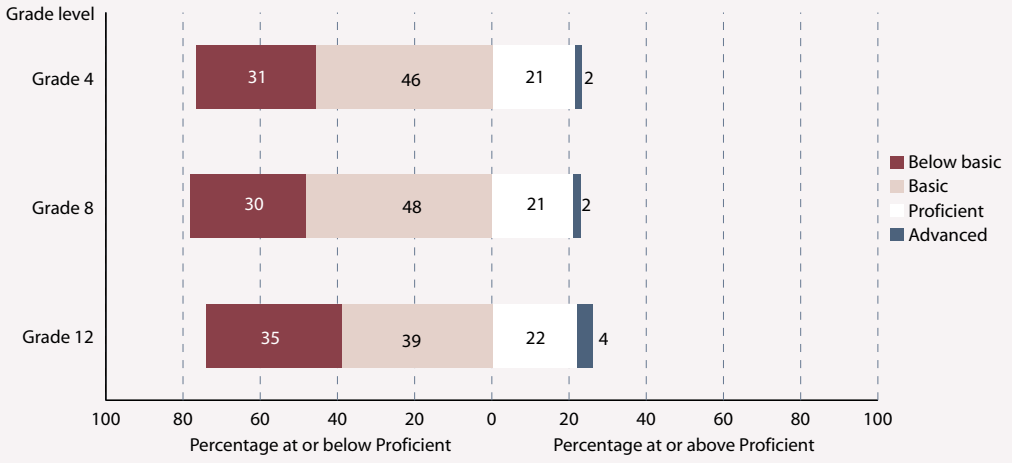
According to the National Assessment of Educational Progress (NAEP) 1998 Civics Report Card for the Nation, *about one-quarter of the students in the United States perform at or above the Proficient level of achievement in civics.*

In 1998, NAEP assessed 4th-, 8th-, and 12th-grade students in civics, providing a picture of how well students understand such topics as civic life, politics and government, the foundations of the American political system, the Constitution, the relationship of the United States to other nations and to world affairs, and the roles of citizens in American democracy. The assessment measures three levels of achievement: Basic, Proficient, and Advanced. At the Basic level, students demonstrate partial mastery of the prerequisite knowledge and skills that are fundamental to achievement at each grade level. At the Proficient level, students perform solidly at each grade level, demonstrating competency with challenging subject matter, including subject-matter knowledge, application of this knowledge to real-world situations, and analytical skills appropriate to the subject matter. At the Advanced level, students exhibit superior performance.

About one-quarter of the students in grades 4, 8, and 12 scored at or above the Proficient level in civics, and about two-thirds of the students scored at or above the Basic level. A sex gap for students in grades 8 and 12 was evident at the Basic level. A higher percentage of females than males performed at the Basic level. The percentages of males and females performing at or above the Proficient level were similar. At the 12th-grade level, however, more males than females performed at the Advanced level of achievement. Fourth-grade males and females performed similarly to one another (see supplemental table 20-1).

Racial-ethnic gaps were also apparent at all three grade levels. White students were consistently more likely to score at or above the Proficient level than all other racial-ethnic groups except Asians/Pacific Islanders. In addition, at the 12th-grade level, white students were more likely than their black and Hispanic peers to score at the Advanced level of achievement (see supplemental table 20-1).

CIVICS PERFORMANCE: Percentage distribution of students, by civics achievement level and grade: 1998



NOTE: Percentages may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, NCES. *NAEP 1998 Civics Report Card for the Nation: Findings from the National Assessment of Educational Progress* (NCES 2000–457), 1999.

FOR MORE INFORMATION:
Supplemental Notes 3, 6
Supplemental Table 20-1

Social and Cultural Behaviors

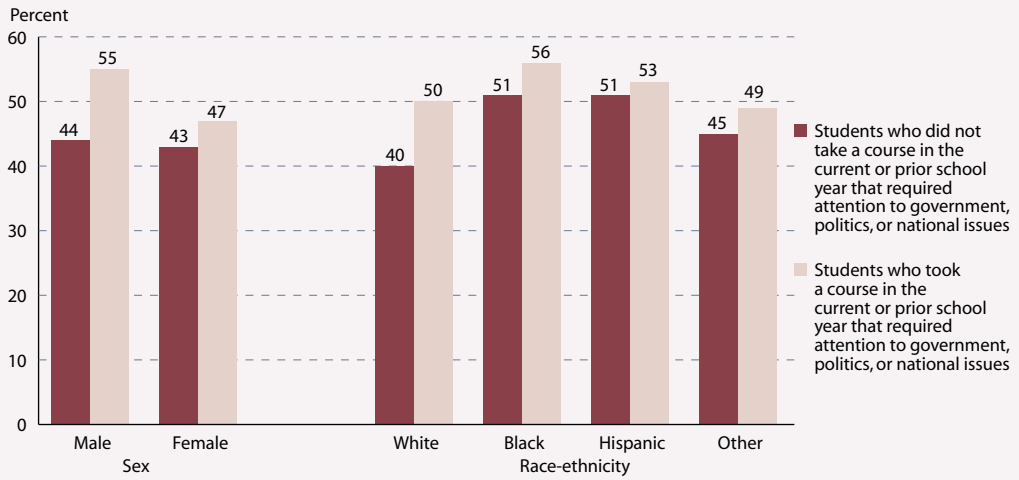
Civic Activities of Students: News Attentiveness

Student news attentiveness is related to school instruction about government. Students in grades 6–12 who recently took a course that required them to pay attention to government, politics, or national issues were more likely than students who had not taken such a course to report a relatively high frequency of news attentiveness.

In the Youth Interview Component of the National Household Education Survey (NHES), a nationally representative sample of 6th–12th-grade students were asked in 1999 about their participation in various news gathering activities outside of school. According to this survey, 49 percent of such students reported either watching or listening to the national news, reading about national issues, or discussing national news and politics with their parents almost daily. Seventy percent of all 6th–12th-grade students reported they had taken courses in the current or prior school year that required them to pay attention to government, politics, or national issues. On average, students who had taken these courses were more likely than those who had not done so to report that they participated in any of the previously mentioned news gathering activities on an almost daily basis (see supplemental table 21-1).

A higher percentage of males than females reported participating in at least one of the three news gathering activities almost daily. Among racial-ethnic groups, black and Hispanic students were more likely than white students to report participating in at least one of the three news gathering activities on an almost daily basis. Some of these differences among population subgroups in news attentiveness did not change when considering coursetaking. Among students who took such a course within the past two years, males were still more likely than females, and black students more likely than white students, to report watching or listening to the national news, reading about national issues, or discussing national news and politics with their parents almost daily.

NEWS ATTENTIVENESS: Percentage of 6th–12th-grade students reporting watching or listening to the national news, reading about national issues, or discussing national news and politics with their parents almost daily, by sex, race-ethnicity, and coursetaking: 1999



SOURCE: U.S. Department of Education, NCES. National Household Education Survey (NHES), 1999 (Youth Interview Component).

FOR MORE INFORMATION:
Supplemental Notes 2, 3
Supplemental Table 21-1

Social and Cultural Behaviors

Voting Participation

Voting rates generally increase with educational attainment. Although voting rates have decreased over time, the rates for adults ages 25–44 with a bachelor's degree or higher decreased less than those with less education.

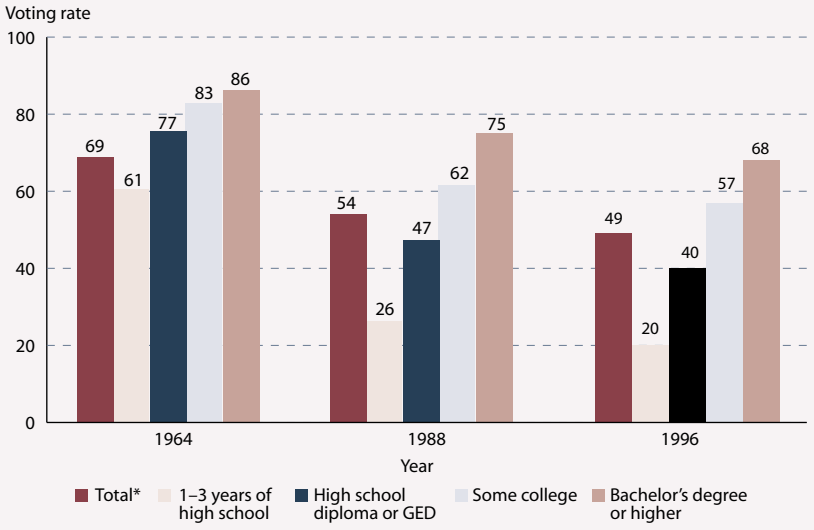
Completion of successively higher levels of education is associated with individuals' participating actively in the political lives of their communities. In the 1998 congressional elections, college graduates ages 25–44, as a group, were 77 percent more likely than high school graduates of the same age group to vote. High school dropouts in the same age range were 52 percent less likely than high school graduates to vote. Similarly, in the 1996 presidential elections, among people ages 25–44, college graduates were 70 percent more likely than high school graduates to vote, and high school dropouts were 49 percent less likely than high school graduates to vote (see supplemental table 22-1).

At all educational attainment levels, however, the voting rates for the 1996 presidential election were lower than those for the 1964 election, and the voting rates for the 1998 congressional election were also lower than those for the 1974 election (see supplemental table 22-1).

There generally was a greater decline in voting rates among those with less education than among those with more education. In the presidential elections, for example, the voting rate for 25- to 44-year-olds with a college degree fell from 86 percent in 1964 to 68 percent in 1996, compared with a decline for those with less than a high school education from 61 percent in 1964 to 20 percent in 1996.

In the 1998 congressional elections, young adults ages 18–24 who were enrolled in college were more likely to have voted than their counterparts of the same age group who were not enrolled in school (24 and 16 percent, respectively). Among those not enrolled, adults ages 21–24 were more likely to vote than those ages 18–20 (see supplemental table 22-2).

VOTING PARTICIPATION: Voting rates for presidential elections for the population ages 25–44, by highest level of education completed: 1964, 1988, and 1996



* Includes those with less than nine years of education.

NOTE: In 1992, the Current Population Survey (CPS) changed the questions used to obtain educational attainment. The voting rate is calculated as the numbers of voters ages 25–44 divided by the total population in the same age group.

SOURCE: U.S. Department of Commerce, Bureau of the Census. *Current Population Reports*, "Voting and Registration in the Election of November" (various years), series P-20, Nos. 143, 440, and 504.

FOR MORE INFORMATION:
Supplemental Note 1
Supplemental Tables 22-1, 22-2

Economic Outcomes

Annual Earnings of Young Adults

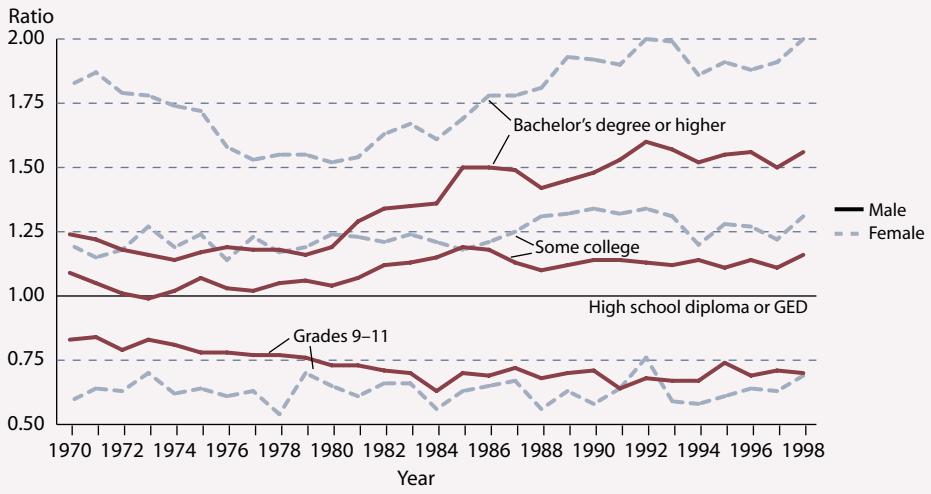
Young adults with higher levels of education earn more than their peers with less education.

Young adults ages 25–34 who completed at least a bachelor's degree earned more than those who had less education. For example, in 1998, male and female college graduates earned 56 and 100 percent more, respectively, than those who completed high school education. In contrast, young males and females ages 25–34 who dropped out of high school earned 30 and 31 percent less, respectively, than their peers who received a high school diploma (see supplemental tables 23-1 and 23-2).

Between 1980 and 1998, the earnings of young adults who completed at least a bachelor's degree have increased relative to their counterparts who completed no more than a high school education. This increase occurred for both men and women, from 19 percent to 56 percent higher for males, and from 52 percent to 100 percent higher for females. During the same period, the earnings of young adults who completed less than a high school education continued to lag behind those with a high school education, varying from 27 percent to 30 percent less for males, and from 35 to 31 percent less for females (see supplemental table 23-2).

The difference in earnings between men and women has declined over time at all education levels. At each level of educational attainment, from high school diploma or GED to a bachelor's degree or higher, the proportionate difference in median annual earnings between male and female wage and salary workers has decreased. For example, in 1998, males with a high school education earned 68 percent more than their female counterparts, while males with at least a bachelor's degree earned 31 percent more than females at the same educational level. In 1970, the comparable figures were 142 percent more for high school completers and 64 percent more for those with at least a bachelor's degree (see supplemental table 23-3).

ANNUAL EARNINGS: Ratio of median annual earnings of all wage and salary workers ages 25–34 with various levels of educational attainment to those with a high school diploma or GED: 1970–98



NOTE: This ratio is most useful when compared with 1.0. For example, the ratio of 1.56 in 1998 for males whose highest education level was a bachelor's degree or higher means that they earned 56 percent more than males who had a high school diploma or GED. The ratio of 0.70 in 1998 for males whose highest education level was grades 9–11 means that they earned 30 percent less than males who had a high school diploma or GED. The Current Population Survey (CPS) questions used to obtain educational attainment were changed in 1992. In 1994, the survey methodology for the CPS was changed and weights were adjusted.

SOURCE: U.S. Department of Commerce, Bureau of the Census. March Current Population Surveys.

FOR MORE INFORMATION:

Supplemental Notes 1, 3

Supplemental Tables 23-1, 23-2, 23-3