Chapter 3: Achievement

Propositions

- Goals 2000 called for ambitious change; we are still awaiting delivery.
- Secondary students' mathematics and English test scores are not commensurate with the time spent on these subjects.
- The shortcomings of our K–12 education system have long-term consequences.
- Homework provides clear results for all students and compelling results for high school students.
- Television viewing is a home-based habit that affects educational achievement.
- The SAT I, although important, is no longer an accurate barometer for historic comparisons.

- **Remedial education at postsecondary institutions is evidence that the K–12 education system is falling short.**
- **The emphasis on community service in K–12 education has clearly increased; its impact is more difficult to measure.**

Highlights

- In 1995 international comparisons of math achievement, American fourth-graders ranked 12th out of 26 nations, eighth-graders ranked 28th out of 41 nations; and twelfth-graders ranked 19th out of 21 nations.[1]
- In 1995 international comparisons of science achievement, American fourth-graders ranked 3rd out of 26 nations, eighth-graders ranked 17th out of 41 nations, and twelfth-graders ranked 16th out of 21 nations.[2]
- Between 1990 and 1999, student scores on the National Assessment of Educational Progress (NAEP) increased slightly (only 17-year-old reading and eleventh-grade writing decreased slightly).[3]
- In 1998, 38 percent of fourth-graders, 26 percent of eighth-graders, and 23 percent of twelfth-graders scored below basic levels in reading.[4]
- In the late 1990s, 77 percent of fourth-grade children in urban, high-poverty areas were reading below the basic level on the NAEP tests.[5]
- Between 1990 and 2000, there was a 19-point increase in average SAT scores. Between 1960 and 2000, however, there was a 56-point decrease.[6]
- Average SAT scores were at their highest level (980) in 1963–64. Between 1964 and 1980, when scores were at their lowest level, scores dropped 90 points.[7]
- Only 33 percent of college and university professors and 39 percent of employers believe that a high school diploma means that a student has "learned the basics," but 66 percent of parents, 74 percent of elementary and

secondary school teachers, and 77 percent of students believe it does.[8]

- Four out of five seniors from the top 55 colleges and universities in the United States received a grade of D or F on a recent standardized American history test.[9]

Overview

It seems that every day we read in the newspapers and hear from the pundits how poorly American students are performing. International comparisons certainly sustain this claim. In standardized tests evaluating students from 21 countries, twelfth-grade American students rank 19th in math and 16th in science. American kids lag behind the traditional education powerhouses of Asia, but they also trail Canada, Iceland, and Slovenia. In literacy comparisons, American children do better but still fall far short of the performances of non-U.S. children when measuring the degree of improved achievement over time.

The bad news is the current ranking of the American children on these international tests. The worse news is that the longer American kids stay in school, the further behind they fall. One should not miss the fact that children from third world countries, not just developed countries, often outperform American children.

Some question the validity of such international comparisons. Education in the United States is universal, so the full distribution of students takes these tests, thus dampening scores when comparisons are made to countries without universal, free education. However, time trends for scores within the United States have fallen as well. In the 1990s, we saw the first uptick in performance in more than 20 years. The question remains: Are the most recent scores aberrations, or have we turned the corner?

Moreover, what do we know about what works and what does not work when it comes to achievement? Does the amount of time dedicated to given subject matter, or the amount of

television watched or homework completed, have any bearing? Theories abound as to why American children are not performing as well as in the past: too little time in school, too many distractions while away from school, lack of discipline while in school. We provide data that tests these theories and others.

Proposition: Goals 2000 called for ambitious change; we are still awaiting delivery.

In 1994, President Bill Clinton signed the Goals 2000: Educate America Act. This aggressive piece of legislation established eight national education goals affecting school readiness; school completion; student achievement and citizenship; teacher education and professional development; mathematics and science; adult literacy and lifelong learning; safe, disciplined, and alcohol- and drug-free schools; and parental participation. In regards to math and science achievement, the act stated, "By the year 2000, United States students will be first in the world in mathematics and science achievement."[10] The year 2000 has come and gone, and the United States not only has missed the mark but also appears to be slipping in international standings.

Student achievement is increasingly important. Test scores and rankings provide the simplest and most accurate measure of what students are learning and how well they are learning. Although parents and educators are often more concerned about student achievement as it relates to the quality of the education delivery system—types of classes and programs offered, school policies regarding conduct, safety, and so on—educational researchers, policy makers, and the business community focus on educational achievement because it is closely correlated with productive skills in the labor market. A highly literate and technologically skilled workforce possesses a competitive advantage in the global marketplace, and international comparisons of student achievement provide a way to evaluate various nations' competitive positions.

Available data allow us to measure achievement in mathematics, science, and reading in three ways. The absolute score method compares achievement of students, of various coun-

tries, in same-age groups, as measured by scale scores in the same year (the average percentage of questions students have answered correctly). Most data in this category measure achievement at the fourth- and ninth-grade levels. The second method is to examine changes in test scores between two grade levels and gauge the relative difference in scores over a given time period. This method is known as a value-added comparison. The third method, same-cohort/value-added, provides the most accurate measure by testing the exact same cohort of students and examining changes in test scores throughout their schooling.[11]

Relative to their peers in other nations, American students' math and science achievement decreases the longer they stay in school. The 1995 TIMSS data show that fourth-graders in the United States' performed fairly well compared to those in 25 other nations, ranking 12th in math and 3rd in science; about average among the 41 nations at the eighth-grade level, ranking 28th in math and 17th in science; and below the 21-nation average at the twelfth-grade level, ranking 19th in math and 16th in science. (See tables 3.1–3.4.)[12]

Table 3.1: **U.S. Student Ranking among TIMSS Countries 1995**

	Math		Science		Countries
Grade	Rank	Percentile	Rank	Percentile	in sample
4	12	54%	3	88%	26
8	28	32	17	59	41
12	19	10	16	24	21

Source: Harold W. Stevenson, "A TIMSS PRIMER: Lessons and Implications for U.S. Education," *Fordham Report* 2, no. 7 (Washington, DC: Thomas B. Fordham Foundation, July 1998).

Table 3.2: **National Student Performance**
TIMSS, Fourth Grade, 1995

Average math score		Average science score	
Country	Score	Country	Score
Significantly higher than U.S.			
Singapore	625	Korea	597
Korea	611		
Japan	597		
Hong Kong	587		
Netherlands[a]	577		
Czech Republic	567		
Austria[a]	559		
Not significantly different from U.S.			
Slovenia[a]	552	Japan	574
Ireland	550	**United States**	**565**
Hungary[a]	548	Austria[a]	565
Australia[a]	546	Australia[a]	562
United States	**545**	Netherlands[a]	557
Canada	532	Czech Republic	557
Israel[a]	531		
Significantly lower than U.S.			
Latvia[a]	525	England	551
Scotland	520	Canada	549
England	513	Singapore	547
Cyprus	502	Slovenia[a]	546
Norway	502	Ireland	539
New Zealand	499	Scotland	536
Greece	492	Hong Kong	533
Thailand[a]	490	Hungary[a]	532
Portugal	475	New Zealand	531
Iceland	474	Norway	530
Iran, Islamic Republic	429	Latvia[a]	512
Kuwait[a]	400	Israel[a]	505
		Iceland	505
		Greece	497
		Portugal	480
		Cyprus	475
		Thailand[a]	473
		Iran, Islamic Republic	416
		Kuwait[a]	401
Country average[b]	**529**		**524**

Source: Harold W. Stevenson, "A TIMSS PRIMER: Lessons and Implications for U.S. Education," *Fordham Report* 2, no. 7 (Washington, DC: Thomas B. Fordham Foundation, July 1998).
Notes: The standard error was calculated at a 95 percent confidence level. TIMSS 1995.
a. Nation not meeting international guidelines.
b. Average of the 26 national averages.

Table 3.3: **National Student Performance**
TIMSS, Eighth Grade, 1995

Average math score		Average science score	
Country	Score	Country	Score
Significantly higher than U.S.			
Singapore	643	Singapore	607
Korea	607	Czech Republic	574
Japan	605	Japan	571
Hong Kong	588	Korea	565
Belgium-Flemish	565	Bulgaria[a]	565
Czech Republic	564	Netherlands[a]	560
Slovac Republic	547	Slovenia[a]	560
Switzerland	545	Austria[a]	558
Netherlands[a]	541	Hungary	554
Slovenia[a]	541		
Bulgaria	540		
Austria[a]	539		
France	538		
Hungary	537		
Russian Federation	535		
Australia[a]	530		
Ireland	527		
Canada	527		
Belgium-French[a]	526		
Sweden	519		
Not significantly different from U.S.			
Thailand[a]	522	England	552
Israel[a]	522	Belgium-Flemish	550
Germany[a]	509	Australia[a]	545
New Zealand	508	Slovak Republic	544
England	506	Russian Federation	538
Norway	503	Ireland	538
Denmark[a]	502	Sweden	535
United States	**500**	**United States**	**534**
Scotland[a]	498	Germany[a]	531
Latvia	493	Canada	531
Spain	487	Norway	527
Iceland	487	New Zealand	525
Greece[a]	484	Thailand[a]	525
Romania[a]	482	Israel[a]	524
		Hong Kong	522
		Switzerland	522
		Scotland[a]	517

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Table 3.3: **National Student Performance—Continued**
TIMSS, Eighth Grade, 1995

Average math score		Average science score	
Country	Score	Country	Score
		Significantly lower than U.S.	
Lithuania	477	Spain	517
Cyprus	474	France	498
Portugal	454	Greece[a]	497
Iran, Islamic Republic	428	Iceland	494
Kuwait	392	Romania[a]	486
Colombia	385	Latvia	485
South Africa	354	Portugal	480
		Denmark[a]	478
		Lithuania	476
		Belgium-French[a]	471
		Iran, Islamic Republic	470
		Cyprus	463
		Kuwait[a]	430
		Colombia	411
		South Africa	326
Country average[b]	**513**		**516**

Source: Harold W. Stevenson, "A TIMSS PRIMER: Lessons and Implications for U.S. Education," *Fordham Report* 2, no. 7 (Washington, DC: Thomas B. Fordham Foundation, July 1998).
Notes: The standard error was calculated at a 95 percent confidence level.
a. Nation not meeting international guidelines.
b. Average of the 41 national averages.

Table 3.4: **National Student Performance**
TIMSS, Twelfth Grade, 1995

Average math score		Average science score	
Country	Score	Country	Score
Significantly higher than U.S.			
Netherlands[a]	560	Sweden	559
Sweden	552	Netherlands[a]	558
Denmark[a]	547	Iceland[a]	549
Switzerland	540	Norway[a]	544
Iceland[a]	534	Canada[a]	532
Norway[a]	528	New Zealand	529
France[a]	523	Australia[a]	527
New Zealand	522	Switzerland	523
Australia[a]	522	Austria[a]	520
Canada[a]	519	Slovenia[a]	517
Austria[a]	518	Denmark[a]	509
Slovenia[a]	512		
Germany[a]	495		
Hungary	483		
Not significantly different from U.S.			
Italy[a]	476	Germany[a]	497
Russian Federation[a]	471	France[a]	487
Lithuania[a]	469	Czech Republic	487
Czech Republic	466	Russian Federation[a]	481
United States[a]	**461**	**United States[a]**	**480**
		Italy[a]	475
		Hungary	471
		Lithuania[a]	461
Significantly lower than U.S.			
Cyprus[a]	446	Cyprus[a]	448
South Africa[a]	356	South Africa[a]	349
Country average[b]	**500**		**500**

Source: Harold W. Stevenson, "A TIMSS PRIMER: Lessons and Implications for U.S. Education," *Fordham Report* 2, no. 7 (Washington, DC: Thomas B. Fordham Foundation, July 1998).
Notes: The standard error was calculated at a 95 percent confidence level.
Because the standard errors average about 5 points, countries whose average scores are close to one another may not differ significantly.
a. Nation not meeting international guidelines.
b. Average of the 21 national averages.

In a value-added comparison of 17 nations, the United States made the least progress between the fourth and eighth grades in math and was 16th in science value-added comparisons. In both disciplines, the U.S. students were above the

mean at the fourth grade but by the eighth grade had slipped below the 17-country averages. (See tables 3.5 and 3.6.)[13]

Table 3.5: **International Value-Added Comparisons**
TIMSS Mathematics, Fourth and Eighth Grades, 1995

Country	Fourth grade mean	Eighth grade mean	Difference
Iceland	338	487	149
Japan	457	605	148
New Zealand	362	508	146
Norway	365	503	138
Korea	471	607	137
Czech Republic	428	564	135
Canada	395	527	133
UK (England)	376	506	130
Greece	356	484[a]	128
Hungary	410[a]	537[a]	127
Australia	408[a]	530[a]	121
Austria	421[a]	539[a]	119
Ireland	412	527	116
Portugal	340	454	115
UK (Scotland)	383	498[a]	115
Netherlands	438[a]	541[a]	103
United States	**407**	**500[b]**	**93**
Country mean[c]	**399**	**526**	**127**

Source: Herbert J. Walberg, "Spending More while Learning Less," *Fordham Report* 2, no. 6 (Washington, DC: Thomas B. Fordham Foundation, July 1998).
Notes: The comparisons are based on a synthetic cohort and do not show the change of a specific group of students.
Fourth-grade average achievement scores and their standard errors for each country are adjusted to fit the eighth-grade achievement-scale.
The standard error was calculated at a 95 percent confidence level.
a. Country did not meet TIMSS sampling requirements, fourth grade.
b. Country only partially met TIMSS sampling requirements.
c. The country mean includes only those countries for which data are available at both levels of education.

Table 3.6: **International Value-Added Comparisons**
TIMSS Science, Fourth and Eighth Grades, 1995

Country	Fourth grade mean	Eighth grade mean	Difference
Hungary[a]	379	554	175
Portugal	314	480	165
Czech Republic	410	574	164
Greece[b]	336	497	161
Netherlands[a,b]	410	560	150
Norway	377	527	150
England[c,d]	404	552	149
Ireland	389	538	149
Iceland	345	494	148
New Zealand	378	526	147
Japan	431	571	140
Austria[a,b]	420	558	138
Scotland[b]	384	517	133
Canada	401	531	130
Australia[a,b]	417	545	127
United States[d]	**421**	**534**	**113**
Korea	460	565	105
Country mean[e]	**393**	**537**	**144**

Source: Herbert J. Walberg, "Spending More while Learning Less," *Fordham Report* 2, no. 6 (Washington, DC: Thomas B. Fordham Foundation, July 1998).
Notes: The comparisons are based on a synthetic cohort and do not show the change of a specific group of students.
Fourth-grade average achievement scores and their standard errors for each country are adjusted to fit the 8th-grade achievement-scale.
The standard error was calculated at a 95 percent confidence level.
a. Country did not meet TIMSS sampling requirements, fourth grade.
b. Country did not meet TIMSS sampling requirements, eighth grade.
c. Country met TIMSS sampling requirements only partially, fourth grade.
d. Country met TIMSS sampling requirements only partially, eighth grade.
e. The country mean includes only those countries for which data are available at both levels of education.

Percentage comparisons of students who scored in the top 10 percent of fourth-graders among the 26 TIMSS countries also show that the United States is lagging. In math, only 9 percent of U.S. fourth-graders were among the top 10 percent, compared to Singapore's 39 percent, Korea's 26 percent, and Japan's 23 percent. At the eighth-grade level, only 5 percent of U.S. students were included in this bracket, compared to Singapore's 45 percent, Korea's 34 percent, and Japan's 32 percent—once again confirming that U.S. students do not fare well

in international comparisons and drop in rankings the further along they are in school.[14]

When comparing America's top students with other nations' top students in both advanced physics and advanced math, the U.S. once again falls short. In advanced physics, U.S. students ranked last among all nations taking the test. In advanced mathematics, U.S. students ranked 15th out of 16 nations. (See table 3.7.)[15]

Table 3.7: **Country Rankings in TIMSS Advanced Physics and Mathematics**

Twelfth-Grade Students, 1995

Rank	Advanced physics	Advanced mathematics
1	Norway	France
2	Sweden	Russia
3	Russia	Switzerland
4	Denmark	Australia
5	Slovenia	Denmark
6	Germany	Cyprus
7	Australia	Lithuania
8	Cyprus	Greece
9	Latvia	Sweden
10	Switzerland	Canada
11	Greece	Slovenia
12	Canada	Italy
13	France	Czech Republic
14	Czech Republic	Germany
15	Austria	**United States**
16	**United States**	Austria

Source: William J. Bennett, *The Index of Leading Cultural Indicators 2001* (Washington, DC: Empower.org, 2001), pp. 95, 96, available online at http://www.empower.org.

Comparing international achievement in reading, fourth-grade students in the United States excelled, ranking 2nd out of 18 nations in the fourth grade. By the eighth grade, however, the United States was tied with the 6th-ranking nation and ranked dead last in value-added comparisons. (See table 3.8.)[16]

Table 3.8: **International Value-Added Comparison**
Literacy, 9- and 14-Year-Old Students, 1991

Country	Age 9	Age 14	Difference
Denmark	291	500	209
East Germany (former)	322	501	180
Netherlands	304	486	178
Switzerland	340	516	172
Canada (BC)	325	494	168
West Germany (former)	329	498	164
Iceland	350	514	163
New Zealand	364	528	163
France	367	531	154
Spain	330	456	150
Sweden	379	529	150
Greece	332	482	147
Italy	365	488	146
Ireland	337	484	142
Norway	358	489	131
Belgium (Fr)	334	446	126
Finland	419	545	126
United States	**389**	**514**	**125**
Country mean	**346**	**500**	**154**

Source: Thomas D. Snyder, ed., *Elementary and Secondary Education: An International Perspective* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2000), p. 127.
Note: The standard error was calculated at a 95 percent confidence level.

Finally, the 1999 TIMSS-Repeat test (a same-cohort/value-added comparison that provides the most up-to-date data) further supported such findings. When the same students were tested in fourth grade and then again in eighth grade, the U.S. students' performance declined in comparison to other nations.[17]

The United States has invested millions of dollars and a great deal of time and effort in the implementation of Goals 2000 and many other achievement-enhancing efforts. Year by year the United States has fallen short of its goals and, according to some, has jeopardized its future international standing. With relatively constant NAEP and SAT scores over the past 20 years, it is difficult to explain the United States' declining international achievement status.

Proposition: Secondary students' mathematics and English test scores are not commensurate with the time spent on these subjects.

With concern regarding student achievement increasing and mounting attention given to the benefits of high standards and regular assessment, a renewed focus on what and how students are taught has also surfaced. A common impression is that students are receiving less and less instruction in the basics; presumably, more time spent on the basics would mean better test results and higher achievement overall. This may not be supported by the facts—right now, although more time has been dedicated to the basics, students' test scores do not reflect the renewed focus.

Between 1966 and 1996, the percentage of time teachers spent in given teaching fields has remained relatively constant in some subjects and changed dramatically in others. Since the lengths of the school day and school year have remained nearly the same over the last 30 years, the amount of time spent teaching specific subjects is easily compared. For example, of the 13 available fields or subjects taught in secondary public schools over the last 30 years, 3 of the 5 showing increased emphasis (math, science, and English) were in "required" subjects. In contrast, 8 subjects—agriculture, business education, foreign languages, health and physical education, home economics, industrial arts, music, and social studies—mostly elective, have had less actual teaching time. (See table 3.9.)[18]

Table 3.9: **Designated Teaching Time in Subject Areas**
Public Secondary School, 1966–96

Field	1966	1971	1976	1981	1986	1991	1996
Agriculture	1.6%	0.6%	0.6%	1.1%	0.6%	3.0%	0.5%
Art	2.0	3.7	2.4	3.1	1.5	2.6	3.3
Business education	7.0	5.9	4.6	6.2	6.5	3.5	4.1
English	18.1	20.4	19.9	23.8	21.8	25.0	23.9
Foreign language	6.4	4.8	4.2	2.8	3.7	3.8	5.2
Health and physical education	6.9	8.3	7.9	6.5	5.6	7.5	5.9
Home economics	5.9	5.1	2.8	3.6	2.6	3.1	2.2
Industrial arts	5.1	4.1	3.9	5.2	2.2	2.1	0.5
Mathematics	13.9	14.4	18.2	15.3	19.2	14.5	17.2
Music	4.7	3.8	3.0	3.7	4.8	4.2	4.3
Science	10.8	10.6	13.1	12.1	11.0	13.3	12.6
Social studies	15.3	14.0	12.4	11.2	13.6	11.0	13.4
Special education	0.4	1.1	3.0	2.1	3.5	5.2	1.7
Other	1.9	3.1	4.0	3.3	3.4	3.9	5.2

Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 71, p. 82.
Note: U.S. public secondary schools. Data are based upon sample surveys of public school teachers. Because of rounding, columns may not add to 100 percent.

Looking at college prep subjects as a whole—English, foreign languages, mathematics, science, and social studies—the percentage of time spent teaching these subjects in public schools has increased steadily since 1966. The increase is substantial; in aggregate, from 65 percent to 72 percent. This amounts to an 11 percent increase in time spent on these subjects over a generation.[19]

Comparing test scores from the NAEP should provide a barometer for tracking performance. Seventeen-year-old NAEP test scores, however, have remained relatively flat or decreased slightly over time. (See table 3.10.)[20]

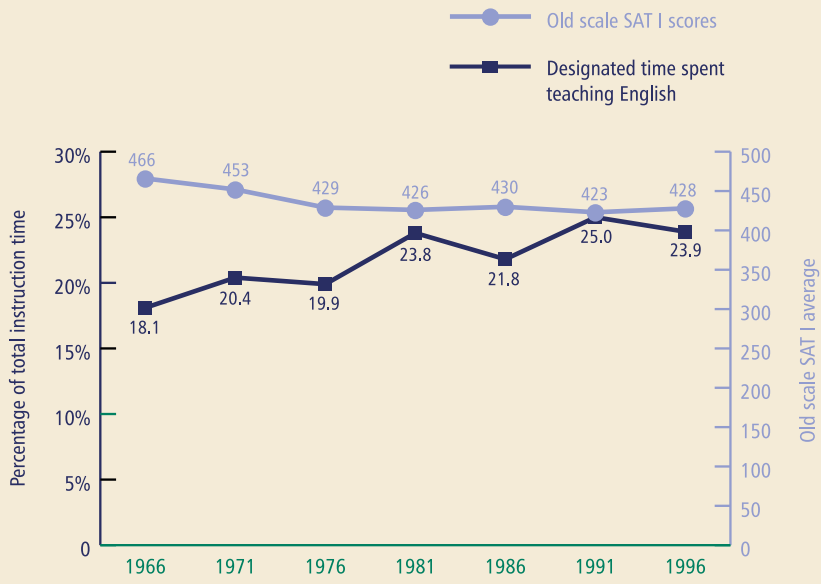
Table 3.10: **NAEP Average Scale Scores**
17-Year-Olds, 1970–99

Subject	1970s	1980s	1992	1999
Mathematics	304.0 (1973)	298.5 (1982)	306.7	308.2
Science	305.0 (1970)	283.3 (1982)	294.1	295.3
Reading	285.2 (1971)	288.8 (1984)	289.7	287.8
Writing (11th grade)	na	290.0 (1984)	287.0	283.0 (1996)

Source: William J. Bennett, *The Index of Leading Cultural Indicators 2001* (Washington, DC: Empower.org, 2001), pp. 97–99, available online at http://www.empower.org.

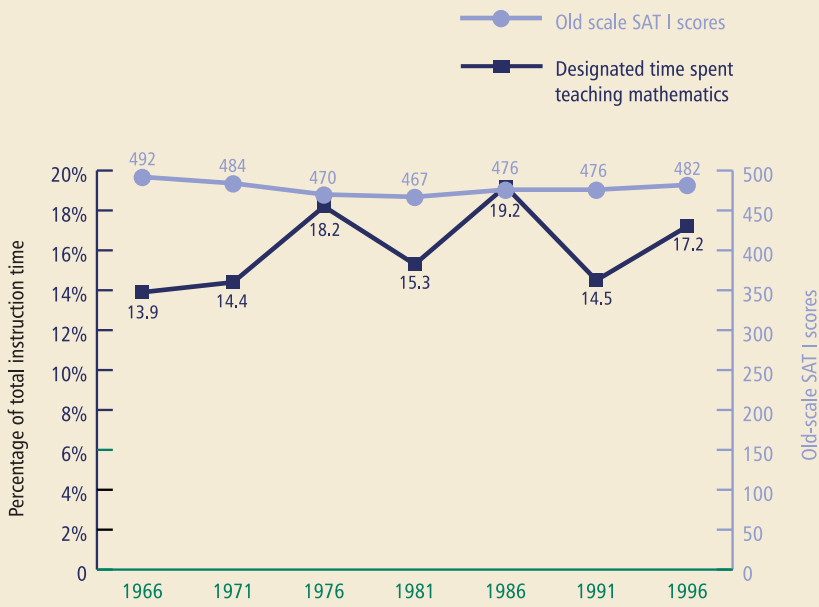
Comparing SAT I test scores appears to support the same conclusions. With additional instruction time dedicated to college prep courses, SAT I[21] test scores should improve. In comparing scores, however, we see that despite the increase in time spent in math and English, test scores overall are decreasing. Ironically, in both subjects, some of the lowest SAT I scores were recorded during the years in which relatively more instruction time was designated to them. (See figures 3.1 and 3.2.)[22]

Figure 3.1: **English Instruction Time and SAT I Verbal Scores 1966–96**



Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), tables 70, 135, pp. 81, 153.
Notes: Old-scale SAT I scores are used due to data availability and accuracy. Old-scale scores have not been recentered.
a. SAT scores for 1996 are actually 1994–95 scores.

Figure 3.2: **Mathematics Instruction Time and SAT I Math Scores**
1966–96



Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), tables 70, 135, pp. 81, 153.
Notes: Old-scale SAT I scores are used due to data availability and accuracy. Old-scale scores have not been recentered.
a. SAT scores for 1996 are actually 1994–95 scores.

The results show that comparing SAT I data from the recentered scale, average total scores decreased from 1,039 to 1,017, a total of 22 points over a 26-year period. Comparing the old scale SAT I data, average total scores decreased from 958 to 910, a total of 48 points over a slightly different but generally overlapping 28-year period. (See table 3.11.)[23]

Table 3.11: **Average SAT Scores**

Old Scale and Recentered Scale, College-Bound High School Seniors, 1966–2001

	Scholastic Assessment Test I Score (recentered scale)			Scholastic Aptitude Test Score (old scale)		
Year	Total	Verbal	Math	Total	Verbal	Math
1966–67	na	na	na	958	466	492
1967–68	na	na	na	958	466	492
1968–69	na	na	na	956	463	493
1969–70	na	na	na	948	460	488
1970–71	na	na	na	943	455	488
1971–72	1,039	530	509	937	453	484
1972–73	1,029	523	506	926	445	481
1973–74	1,026	521	505	924	444	480
1974–75	1,010	512	498	906	434	472
1975–76	1,006	509	497	903	431	472
1976–77	1,003	507	496	899	429	470
1977–78	1,001	507	494	897	429	468
1978–79	998	505	493	894	427	467
1979–80	994	502	492	890	424	466
1980–81	994	502	492	890	424	466
1981–82	997	504	493	893	426	467
1982–83	997	503	494	893	425	468
1983–84	1,001	504	497	897	426	471
1984–85	1,009	509	500	906	431	475
1985–86	1,009	509	500	906	431	475
1986–87	1,008	507	501	906	430	476
1987–88	1,006	505	501	904	428	476
1988–89	1,006	504	502	903	427	476
1989–90	1,001	500	501	900	424	476
1990–91	999	499	500	896	422	474
1991–92	1,001	500	501	899	423	476
1992–93	1,003	500	503	902	424	478
1993–94	1,003	499	504	902	423	479
1994–95	1,010	504	506	910	428	482
1995–96	1,013	505	508	na	na	na
1996–97	1,016	505	511	na	na	na
1997–98	1,017	505	512	na	na	na
1998–99	1,016	505	511	na	na	na
1999–2000	1,019	505	514	na	na	na
2000–01	1,020	506	514	na	na	na

Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 135, p. 153.
Notes: Scholastic Assessment Test, formerly known as the Scholastic Aptitude Test.
Averages of college-bound high school seniors. Possible scores on each part of the SAT range from 200 to 800.
Data for 1972 to 1986 were converted to the recentered scale by using a formula applied to the original mean and standard deviation. For 1987 to 1995, individual student scores were converted to the recentered scale and recomputed. For 1996 and 1997, most students received scores on the recentered scale score. Any score on the original scale was converted to the recentered scale prior to recomputing the mean.
Data for the years 1966–67 through 1970–71 are estimates derived from the test scores of all participants. Test was recentered in 1995.

Using the SAT I as a barometer for achievement is not without controversy. Some consider the SAT I an excellent predictor of college preparedness but not an accurate gauge of academic achievement. The SAT I does, however, provide largely comparable scores from the mid-1950s through 1995, prior to its recentering. Also, perhaps more than with any other test, extensive studies regarding the SAT I's relevance and validity have been done. On the other hand, the SAT I has several weaknesses: the test is self-selecting, it lacks comparable scores from a variety of grade levels, and the range of subjects covered is limited (verbal and math). Furthermore, the number of SAT I test takers has increased dramatically.[24] For example, in 1972, only 34.1 percent of high school graduates took the SAT I; by 1995, 41.8 percent were taking it.[25] The larger number of students taking the test dips deeper into the pool and will tend to affect the overall average adversely. Despite these caveats, most experts feel that the SAT I is one basis for achievement comparison.

Using the NAEP and SAT I scores as measures, the increased emphasis on math, science, and English has not been reflected in improved performance. Although many factors influence test scores, assuming that increased instruction time leads to better test scores may be presumptuous.

Proposition: The shortcomings of our K–12 education system have long-term consequences.

In the United States, educational excellence has always been important. Many consider it a gauge for determining the vibrancy and health of our nation and an indicator of potential economic growth and development. In 1989, for example, the nation's governors set a goal that U.S. students be first in the world in math and science by the turn of the century; in 1994, Congress enacted the Goals 2000: Educate America Act, which set the same goal.[26] This goal was not achieved. Moreover, according to then-Secretary of Education Richard W. Riley, "American children continue to learn, but their peers in other countries are learning at a higher rate."[27]

The results of the TIMSS-Repeat are discouraging. This 1999 follow-up study to the first TIMSS (1995) tested the same cohorts that had done well as fourth-graders in international comparisons, scoring in the top 25 percent in 1995. By 1999, as eighth-graders, these students had dropped dramatically in their rankings, confirming that the further along in school one looks, the further behind U.S. students fall in math and science. The only American group that showed improvement since the 1995 survey were black students, whose achievement rose in math but not in science.[28]

These shortcomings in our elementary and secondary educational system affect higher education, as well. For example, the five highest-performing countries in eighth-grade mathematics in the TIMSS-Repeat were all Asian—Singapore, Korea, China, Hong Kong, and Japan. In science, four out of the top five were Asian countries—China, Singapore, Japan, and Korea.[29] Not surprisingly, the highest percentages of foreign students enrolled in institutions of higher education in the United States represent Asia. Furthermore, the percentage of Asian students

has grown relative to foreign enrollment from 30.3 percent in the 1980–81 school year to 54.4 percent in the 1999–2000 school year.[30]

In the United States, the number of bachelor's, master's, and doctoral degrees in science and math awarded to U.S. citizens compared to non-U.S. citizens has decreased over time. In the 1979–80 school year, for example, of the total number of Ph.D. degrees conferred in the physical sciences, U.S. students received nearly 76 percent and foreign students received nearly 22 percent. (The percentages do not total 100 because some students' citizenship status was unknown.) In the 1998–99 school year, 54 percent of doctoral degrees in physical sciences were conferred on U.S. citizens versus 41 percent on foreign citizens. The trend is exhibited in all fields. Furthermore, in that same year, of those receiving Ph.D.s in mathematics and engineering, only 49.6 and 46.4 percent, respectively, were U.S. citizens. In mathematics, of those reporting, there are now more noncitizens than U.S. citizens receiving Ph.D.s. (See table 3.12 and figures 3.3 and 3.4.)[31]

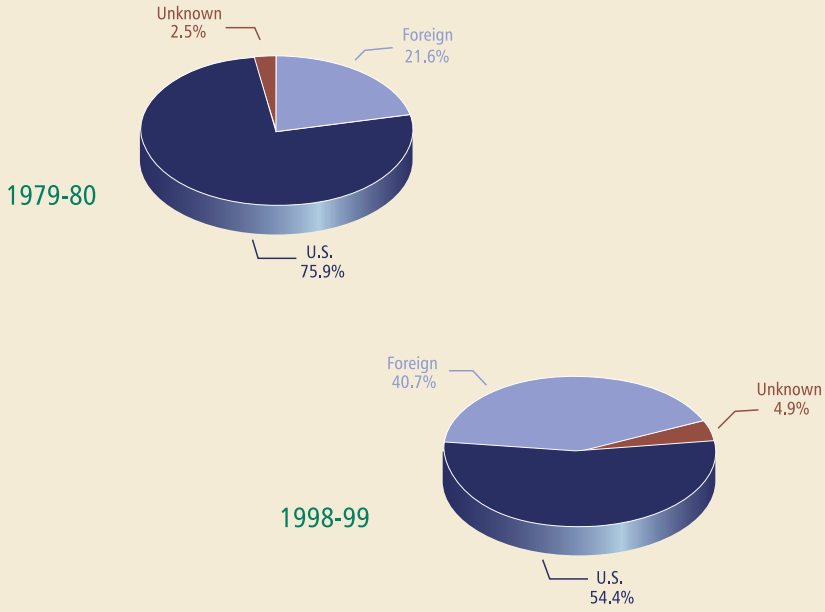
Table 3.12: **Proportions of Ph.D. Degrees Conferred on Non-U.S. Citizens**

Field	1979–80	1998–99
Engineering	46.3%	48.6%
Physical sciences	21.6	40.7
Life sciences	17.6	33.4
Social sciences	11.6	17.5
Humanities	8.8	17.4
Education	8.2	10.6

Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), tables 302–304, 306–308, pp. 349–352.

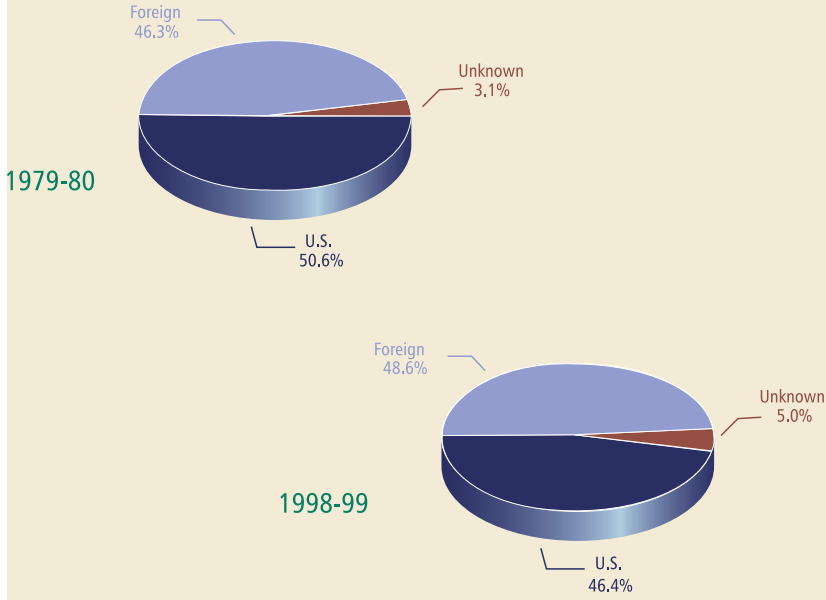
Figure 3.3: **National Origin and Doctor's Degrees Awarded by U.S. Universities**

Physical Sciences, 1979–80 & 1998–99



Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 307, p. 352.

Figure 3.4: **National Origin and Doctor's Degrees Awarded by U.S. Universities**
Engineering, 1979–80 & 1998–99



Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 304, p. 350.

The number of foreign students enrolled in institutions of higher education in the United States continues to grow at the undergraduate, as well as the graduate, level. In 1980, some 311,880 foreign students were enrolled in institutions of higher education in the United States, 2.6 percent of total enrollment. In the 1999–2000 school year, a total of 514,723 foreign students were enrolled, 3.5 percent of enrollment, an increase of more than 35 percent during this time period. Most of the growth came from two regions, Asia and Europe, both of which nearly tripled in enrollment; enrollment of students from Middle East countries, in contrast, fell by more than half. (See table 3.13.)[32]

Table 3.13: **Foreign Students Enrolled in U.S. Higher Education**

	1980–81		1999–2000		
Home region	Number	% of total	Number	% of total	19-year growth
Asia	94,640	30.3%	280,146	54.4%	196%
Europe	25,330	8.1	78,485	15.2	201
Latin America	49,810	16.0	62,098	12.1	25
Middle East	84,710	27.2	34,897	6.8	–58
Africa	38,180	12.2	30,292	5.9	–21
North America	14,790	4.7	24,128	4.7	63
Oceania	4,180	1.3	4,676	0.9	12
Total	**311,640**	**100.0**	**514,722**	**100.0**	**65**

Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 416, p. 486.

The United States' postsecondary education is still considered the best in the world, but its elementary and secondary education is slipping in international rankings. Although the United States has benefited in many ways from the influx of foreign students when they stay in the United States, participating as a part of American society and contributing to economic growth and research and development, they don't all stay. And those who choose to stay may not do so for their entire lifetimes. In 1995, for example, only 53.6 percent of foreign Ph.D. recipients stayed in the United States.[33]

As the world economy becomes more globalized, the United States has become increasingly dependent on the skills of the international students who gain advanced degrees in the hard sciences. The ramifications of poor achievement in elementary and secondary schools extend far beyond twelfth grade.

Proposition: Homework provides clear results for all students and compelling results for high school students.

In 1983, the nationally commissioned report *A Nation At Risk* recommended that homework requirements be increased to improve student achievement. Today, however, experts disagree on the value of homework. While some still feel that this is an area where schools, teachers, and parents have become too lax, others feel that too much homework can create excessive amounts of stress and allow for too little free time. Interestingly, the amount of homework the average American tenth-grader is assigned has not changed dramatically over time. In 1982, it was just under 1 hour per day; in 2000, the amount was just a few minutes less.

The purpose of homework is to develop intellectual discipline, establish good study habits, balance classroom workload, and supplement and reinforce material covered in class. It also serves as a link between home and school. Moreover, recent studies have strengthened the case for a positive relationship between homework and achievement.

The amount of time spent on homework is easily measured; however, using time as the only barometer for success can be deceptive. Quality is not easy to measure. An exhaustive analysis of numerous studies regarding homework provided by the School Improvement Research Series concluded that homework is most effective when it is

- relevant to learning objectives
- appropriate to students' learning ability and maturity
- assigned regularly
- collected, corrected, and reviewed in class

- assigned in reasonable amounts
- well explained
- supported by parents

Homework may also be used to close achievement gaps between students, resulting in more homework for some.[34]

In the School Improvement Research Series, a comprehensive study also asked the following questions: Does homework improve achievement? Does the amount of homework matter? When comparing the achievement of students who were given homework to those who were not, 14 of 20 studies showed effects favoring homework. Interestingly, grade level played a dramatic role. High school students in a class with assigned homework outperformed fellow students who did not receive assigned homework by about 70 percent. In junior high school, the difference was only 35 percent. In elementary school, there was no discernible difference. Also, out of 50 independent studies, 43 (86 percent) indicated that students who did more homework had better test scores or class grades. Once again, a strong correlation with grade level was apparent, and the patterns were consistent over time. (See tables 3.14 and 3.15 and figures 3.5 and 3.6.)[35]

Table 3.14: **Homework and NAEP Reading Scores 1984–99**

Daily time spent on homework	9-year-olds			13-year-olds			17-year-olds		
	1984	1994	1999	1984	1994	1999	1984	1994	1999
None									
Average proficiency	212	213	210	254	250	251	276	273	275
Percentage	36%	32%	26%	23%	23%	24%	22%	23%	26%
Did not do assignment									
Average proficiency	199	200	204	247	243	249	287	285	282
Percentage	4%	5%	4%	4%	6%	5%	11%	11%	13%
Less than 1 hour									
Average proficiency	218	212	214	261	261	262	290	288	291
Percentage	42%	48%	53%	36%	34%	37%	26%	27%	26%
1 to 2 hours									
Average proficiency	216	214	215	266	268	269	296	297	296
Percentage	13%	12%	12%	29%	28%	26%	27%	26%	23%
More than 2 hours									
Average proficiency	201	193	197	265	270	269	303	306	300
Percentage	6%	4%	5%	9%	9%	8%	13%	13%	12%

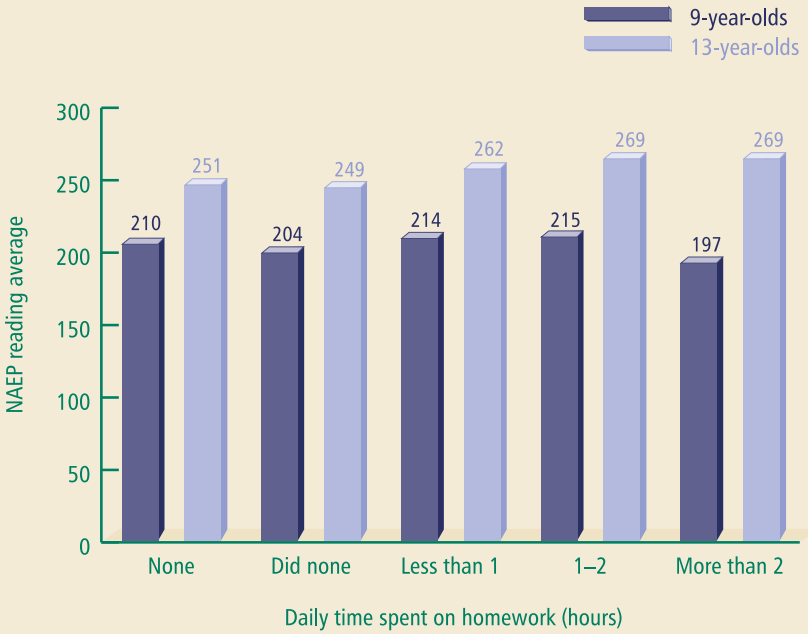
Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002).
Note: NAEP scale scores. Percentages of all in a given year's age group.
Because of rounding, columns may not add to 100 percent.

Table 3.15: **Homework and NAEP U.S. History Scores 1994**

Daily time spent on homework	Grade 4	Grade 8	Grade 12
Usually do not have it			
Average proficiency	209	245	272
Percentage	13%	7%	13%
Usually do not do it			
Average proficiency	180	244	279
Percentage	3%	8%	8%
1/2 hour or less			
Average proficiency	204	279	287
Percentage	39%	22%	23%
1 hour			
Average proficiency	209	262	287
Percentage	30%	36%	29%
More than 1 hour			
Average proficiency	200	266	295
Percentage	16%	27%	26%

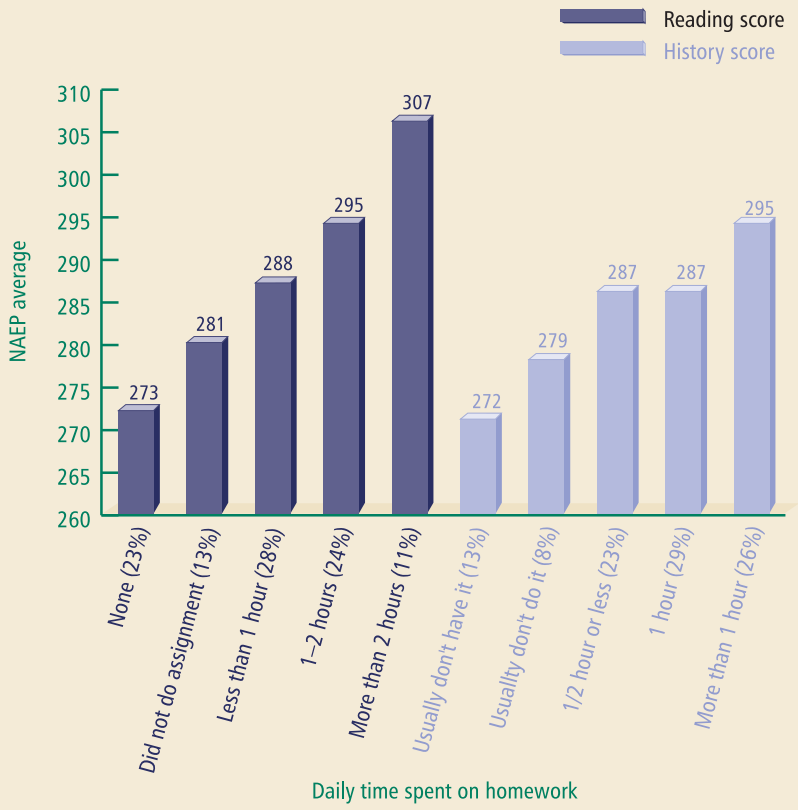
Source: U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 18-3, available online at http://nces.ed.gov/pubsold/ce96/c9618d03.html.
Note: NAEP scale scores, 1994. Percentages of all in grade group.
Because of rounding, columns may not add to 100 percent.

Figure 3.5: **Homework and NAEP Reading Scores**
9- and 13-Year-Olds, 1999



Sources: U.S. Department of Education, National Center for Education Statistics; *NAEP 1999 Long-Term Trend Reading Summary,* Data Tables for Age 9 Student Data, available online at http://llnces.ed.gov/nationsreportcard/tables/Ltt1999/NTR11012.asp; *NAEP 1999 Long-Term Trend Reading Summary,* Data Tables for Age 13 Student Data, available online at http://llnces.ed.gov/nationsreportcard/tables/Ltt1999/NTR21012.asp.

Figure 3.6: **Homework and NAEP Reading and History Scores**
17-Year-Olds or Twelfth-Graders, 1996



Sources: Thomas D. Snyder, ed., *Digest of Education Statistics, 1999* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2000), table 114, p. 132; U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 18-3, available at http://nces.ed.gov/pubsold/ce96/c9618d03.html.

Furthermore, in another comprehensive study by the International Association for the Evaluation of Educational Achievement, a significant and positive correlation was found between the amount of time spent a week on homework and grades. In addition, "low-ability" students who spent 10 or

more hours a week on homework got higher grades than "high-ability" students who did not.[36]

Many factors contribute to the quality and effectiveness of homework, including a commitment by the teacher, parent, and student. Although the older the student, the greater the impact, what cannot be measured is the impact homework in early grades has on formulating good study habits, academic discipline, and basic preparation for later years. Homework for elementary students may not produce higher test scores, but it may lay the foundation for future success.

Proposition: Television viewing is a home-based habit that affects educational achievement

Numerous changes to enhance academic achievement have been recommended, but few have been applicable outside of school; decreased television viewing may be an exception. Studies show that the amount of time students spend watching television affects achievement. If a student spends several hours a night watching television, less time is available for homework, reading, or other instructional activities; it may also be that there is less time for needed sleep. By monitoring and limiting their children's television viewing, parents can be more actively involved in improving their children's achievement.

The television has become a centerpiece of American home life. Over the past 50 years, the amount of television watched steadily increased, and only recently has the number of hours plateaued or decreased slightly. According to the Advisory Panel on the Scholastic Aptitude Test (SAT) Score Decline, "By age 16 most children [in America] have spent 10,000 to 15,000 hours watching television, more time than they have spent in school. When they reach first grade, their watching time is between 20 and 35 hours per week; this usually peaks at about age 12. The average time per child per day increased by approximately an hour between 1960 and 1970."[37] According to one intensive study, in 1982, high school seniors, on average, watched television 31.0 hours per week but spent only 4.4 hours doing homework.[38]

During the 1990s, however, the amount of time spent by students watching television declined. (See table 3.16 and figure 3.7.)

- Between 1992 and 1998, fourth-graders' television viewing decreased from an average of 3.39 hours per day to 3.04.

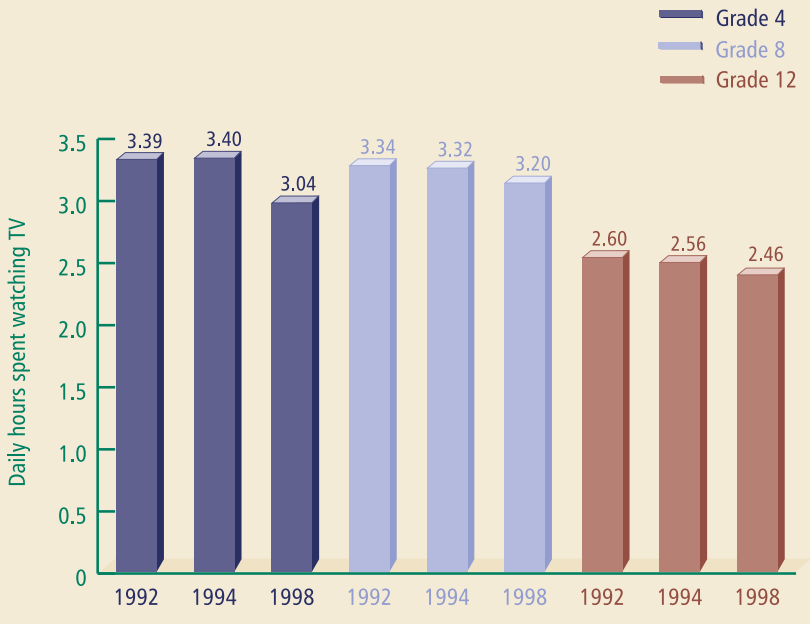
- Between 1992 and 1998, eighth-graders' television viewing decreased from an average of 3.34 hours per day to 3.20.
- Between 1992 and 1998, twelfth-graders' television viewing decreased from an average of 2.60 hours per day to 2.46. [39]

Table 3.16: **Time Watching Television and Reading Performance**
1992–98

Daily time spent watching TV	Grade 4			Grade 8			Grade 12		
	1992	1994	1998	1992	1994	1998	1992	1994	1998
6 hours or more									
Average proficiency	199	194	198	241	239	244	271	264	260
Percentage	20%	21%	16%	14%	14%	12%	6%	7%	6%
4–5 hours									
Average proficiency	216	216	216	258	257	259	284	280	281
Percentage	22%	22%	19%	27%	27%	26%	20%	18%	17%
2–3 hours									
Average proficiency	224	222	223	265	265	269	293	289	292
Percentage	40%	38%	41%	46%	45%	47%	47%	46%	46%
1 hour or less									
Average proficiency	221	220	222	270	270	271	301	297	300
Percentage	19%	19%	24%	13%	14%	15%	27%	29%	31%
Average hours daily	3.39	3.4	3.04	3.34	3.32	3.2	2.6	2.56	2.46

Source: National Center for Education Statistics, "Television Viewing," *The Nation's Report Card* (Washington, DC: Department of Education, National Center for Education Statistics, 1999), available online at http://nces.ed.gov/NAEP/policy/pol_use_recent_tv.asp.
Note: NAEP scales scores. Percentages of all in a given year's age group.
Because of rounding, columns may not add to 100 percent.

Figure 3.7: **Average Hours of Television Watched per Day 1992–98**



Source: Educational Testing Service, *America's Smallest School: The Family* (Princeton, NJ: Educational Testing Service, Policy Information Center, Educational Testing Service Network, 1999), available online at http://www.ets.org/research/pic/ssfig12.html.

One caveat to this trend, however, is the increasing amount of time students spend playing video games and on the Internet. An NCES study showed a decrease between 1982 and 1992 in the percentage of high school seniors who watched 5 or more hours of television on weekdays. In 1992, the study introduced a new category defining use of time: video game playing. According to the data, 13 percent of seniors spent more than an hour a day playing video games. This activity was not even presented as an option in the 1982 questionnaire.[40]

Moreover, in 1995, 77 percent of children reported sometimes playing video games at home, and 24 percent reported playing every day. Internet and video game playing may make up for the decrease in television viewing.[41] When comparing these data, one must be cautious. Time spent on the Internet may be education-enhancing; clearly, one of the great benefits of the World-Wide Web is the accessibility to a wide knowledge base. Just as all television is not "bad" and distracting, neither is all time spent on the Internet.

Large amounts of television viewing, however, appear to lower test scores. Although one study's assessment did not establish a causal relationship, NAEP scores in 1998 revealed that students who watch long hours of television have lower proficiencies in school. For example, fourth-grade students who watched 1 hour or less of television had an average scale reading score of 222. In contrast, those who watched 6 or more hours had an average score of 198. Eighth- and twelfth-grade scores were similar. In fact, the older the students, the greater the achievement gap between those students who watched 1 hour or less of television and those who watched 6 hours or more. These patterns are remarkably consistent over time. (See table 3.16.)[42]

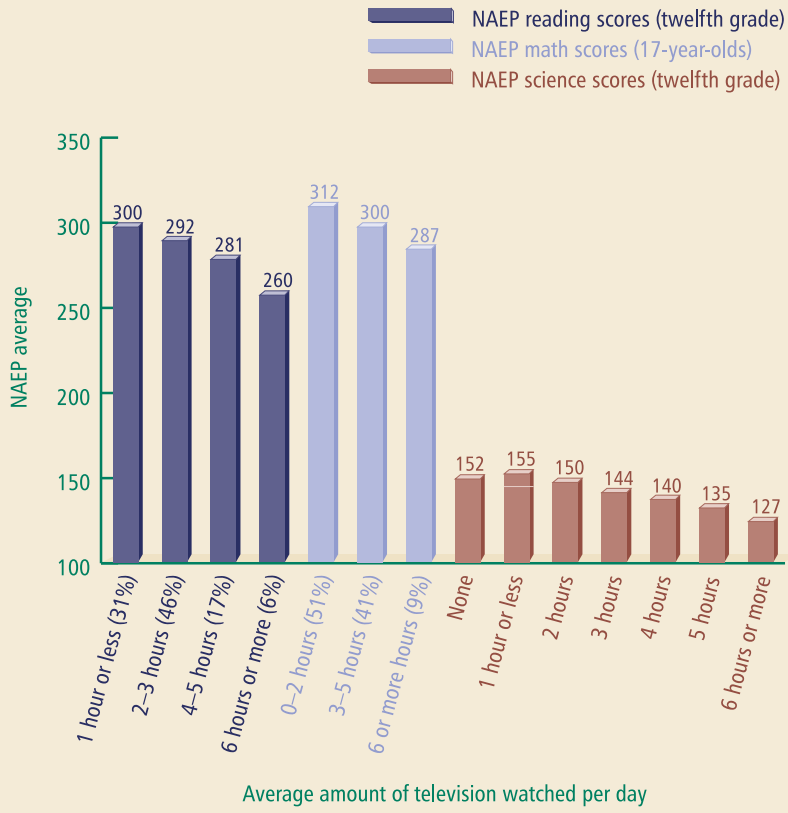
NAEP math and science proficiency scores for twelfth-grade students exhibit the same pattern. Seventeen-year-olds who watched between 0 and 2 hours of television a day averaged a score of 312 in math. Students who watched between 3 and 5 hours scored 300 on average; those who watched 6 or more hours averaged 287. (See table 3.17 and figure 3.8.)[43]

Table 3.17: **Time Watching Television and Science Performance 2000**

Daily time spent watching TV	Grade 8 scale scores	Grade 12 scale scores
6 hours or more	131	127
5 hours	142	135
4 hours	148	140
3 hours	153	144
2 hours	158	150
1 hour or less	160	155
None	152	152

Source: National Center for Education Statistics, *National Assessment of Educational Progress: 2000 Science Assessment,* available online at http://nces.ed.gov/naep3/science/results/television-g8.asp.
Note: NAEP science scale scores, 2000.

Figure 3.8: **Amount of Television Watched and NAEP Scores**
17-Year-Olds or Twelfth-Graders, 1998



Source: National Center for Education Statistics, "Television Viewing," *The Nation's Report Card* (Washington, DC: Department of Education, National Center for Education Statistics, 1999), available online at http://nces.ed.gov/NAEP/policy/pol_use_recent_tv.asp.

An earlier state-by-state assessment of math proficiency among eighth-graders demonstrated that, in general, the higher the percentage of students watching long hours of television, the lower the math proficiency. For example, North Dakota and Montana have the lowest percentages of eighth-grade

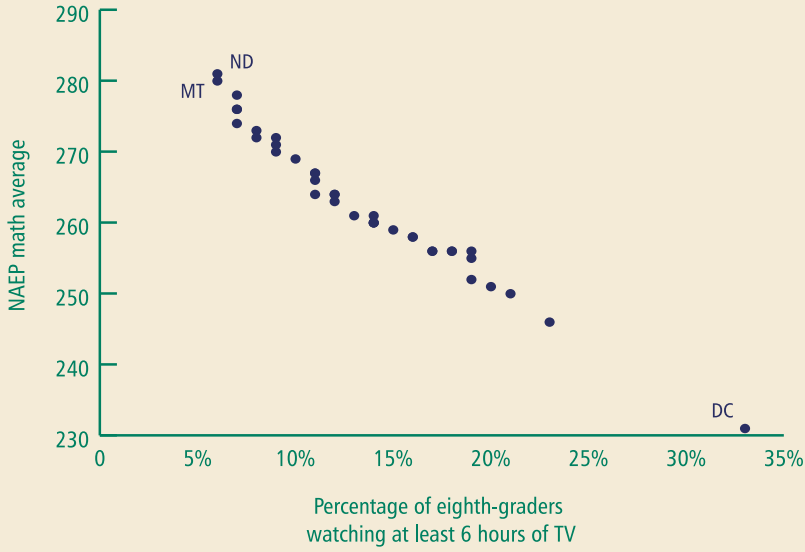
students who watch 6 or more hours of television per day (6 percent each), and their NAEP scores were the highest among state averages. In contrast, in Washington, D.C., one in three eighth-graders watched 6 or more hours of television each day, and their scores were the lowest in the sample. Statistics show a strong correlation between more hours spent watching television and lower test scores even when accounting for parental education levels and population size. In statistical terms, the uncontrolled correlation between television viewing and test scores is –0.87—the more time spent watching television, the lower the test score. Controlling for parental education levels does not change the relationship; however, the correlation coefficient does drop to –0.75 (although still statistically significant) when the data are weighted by population size. (See table 3.18 and figure 3.9.)[44]

Table 3.18: **Extensive Television Viewing and Mathematics Proficiency**
Eighth Grade, 1990

State[a]	Average NAEP math proficiency	Percentage of students watching at least 6 hours or more of TV daily
North Dakota	281	6%
Montana	280	6%
Iowa	278	7%
Nebraska	276	7%
Minnesota	276	7%
Wisconsin	274	7%
New Hampshire	273	8%
Idaho	272	9%
Wyoming	272	8%
Oregon	271	9%
Connecticut	270	9%
New Jersey	269	10%
Indiana	267	11%
Colorado	267	11%
Pennsylvania	266	11%
Virginia	264	12%
Michigan	264	12%
Ohio	264	11%
Oklahoma	263	12%
Delaware	261	14%
New York	261	13%
Maryland	260	14%
Illinois	260	14%
Rhode Island	260	14%
Arizona	259	15%
Georgia	258	16%
Texas	258	16%
Arkansas	256	19%
West Virginia	256	18%
Kentucky	256	18%
California	256	17%
New Mexico	256	17%
Florida	255	19%
Alabama	252	19%
Hawaii	251	20%
North Carolina	250	21%
Louisiana	246	23%
District of Columbia	231	33%

Source: Educational Testing Service, *America's Smallest School: The Family* (Princeton, NJ: Educational Testing Service, Policy Information Center, Educational Testing Service Network, 1999), available online at http://www.ets.org/research/pic/ssfig12.html.
Note: a. Some states provided insufficient data or did not participate.

Figure 3.9: **Television Viewing and Math Proficiency By State, Eighth Grade, 1990**



Source: Educational Testing Service, *America's Smallest School: The Family* (Princeton, NJ: Educational Testing Service, Policy Information Center, Educational Testing Service Network, 1999), available online at http://www.ets.org/research/pic/ssfig12.html.

No school reform recommendation can stand alone; however, curbing the amount of television students watch each day may play an important role in achievement. Many recommendations for improving achievement are directly connected to the classroom—teachers, class size, curriculum, spending—but television viewing is based in the home.

Proposition: The SAT I, although important, is no longer an accurate barometer for historic comparisons.

The College Board's Scholastic Assessment Test was once a consistent predictor of college preparedness and an easy gauge for academic comparisons. It was also viewed as a way to compare one cohort of students against another.

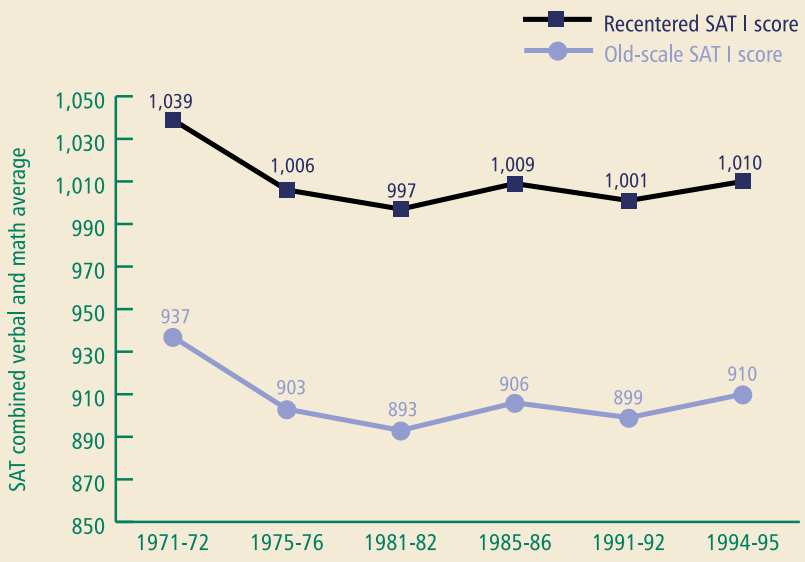
In April 1995, however, this changed. The SAT I[45] score scale was recentered to reestablish the original mean score of 500 on the 200–800 scale in an effort to maintain the SAT I's statistical integrity and predictive validity.[46] The scale had not been recalibrated since 1941, when it reflected the norm of approximately 10,000 students (less than 1 percent of secondary school enrollment), of whom 62 percent were male and 41 percent attended independent or private schools.[47] Compare that to the 1,260,278 students (nearly 9 percent of total secondary school enrollment), 46 percent male and 17 percent attending religious or independent schools, who took the SAT I in 2000. As mean scores fell below 500, the score distribution became stretched in the upper half and compressed in the lower half. The old scale no longer reflected the normal curve distribution of scores, as originally envisioned. The new recentered scale reflects a normal curve distribution of scores that accounts for a larger, more diverse population and boosts average scores by 100 points. (See table 3.19 and figure 3.10.)[48]

Table 3.19: **Scholastic Aptitude Test 1972–95**

Year	High school graduates (thousand)[a]	SAT test takers: Number (thousand)[a]	SAT test takers: % of graduates[b]	SAT test takers: % minority	Scores: Combined Mean	Scores: Verbal: Mean score	Scores: Verbal: % scoring at least 600	Scores: Math: Mean	Scores: Math: % scoring at least 600
1972	3,001	1,023	34.1%	na	937	453	11%	484	17%
1973	3,036	1,015	33.4	na	926	445	10	481	16
1974	3,073	985	32.1	na	924	444	10	480	17
1975	3,133	996	31.8	na	906	434	8	472	15
1976	3,148	1,000	31.8	15.0%	903	431	8	472	17
1977	3,155	979	31.0	16.1	899	429	8	470	16
1978	3,127	989	31.6	17.0	897	429	8	468	15
1979	3,117	992	31.8	17.1	894	427	7	467	15
1980	3,043	992	32.6	17.9	890	424	7	466	15
1981	3,020	994	32.9	18.1	890	424	7	466	14
1982	2,995	989	33.0	18.3	893	426	7	467	15
1983	2,888	963	33.3	18.9	893	425	7	468	16
1984	2,767	965	34.9	19.7	897	426	7	471	17
1985	2,677	977	36.5	20.0	906	431	7	475	17
1986	2,643	1,001	37.9	na	906	431	8	475	17
1987	2,694	1,080	40.1	21.8	906	430	8	476	18
1988	2,773	1,134	40.9	23.0	904	428	7	476	17
1989	2,727	1,088	39.9	25.3	903	427	8	476	18
1990	2,588	1,026	39.7	26.6	900	424	7	476	18
1991	2,493	1,033	41.4	28.0	896	422	7	474	17
1992	2,483	1,034	41.6	28.5	899	423	7	476	18
1993	2,481	1,044	42.1	30.0	902	424	7	478	19
1994	2,479	1,050	42.4	31.0	902	423	7	479	18
1995	2,553	1,068	41.8	31.0	910	428	8	482	21

Source: U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 22-1, available online at http://nces.ed.gov/pubsold/ce96/c9622d01.html.
Notes: Old-scale SAT.
Some data revised from previously published figures.
a. Includes both public and private schools.
b. High school grads who took the SAT at any time while in high school.

Figure 3.10: **SAT I Scores 1971–95**



Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 135, p. 153.

Intentional or not, however, the recentering changed several things. It is now easier to score a 1600 on the SAT I. The College Board's conversion chart shows that a pre-1995 verbal score of 730 or above and a math score of 780 or above are equivalent to a perfect 800 score on the tests today. The minimum verbal score today, 230, is 30 points higher than it was pre-1995. The minimum math score has remained the same.[49] It is now possible for a student to obtain a perfect score of 1,600 even with up to four wrong answers; this was not the case before 1995.[50] Critics say the test has been further diluted—difficult sections of the verbal portion have been

removed; students now have an additional 30 minutes to take the test, and they are allowed to use calculators.[51]

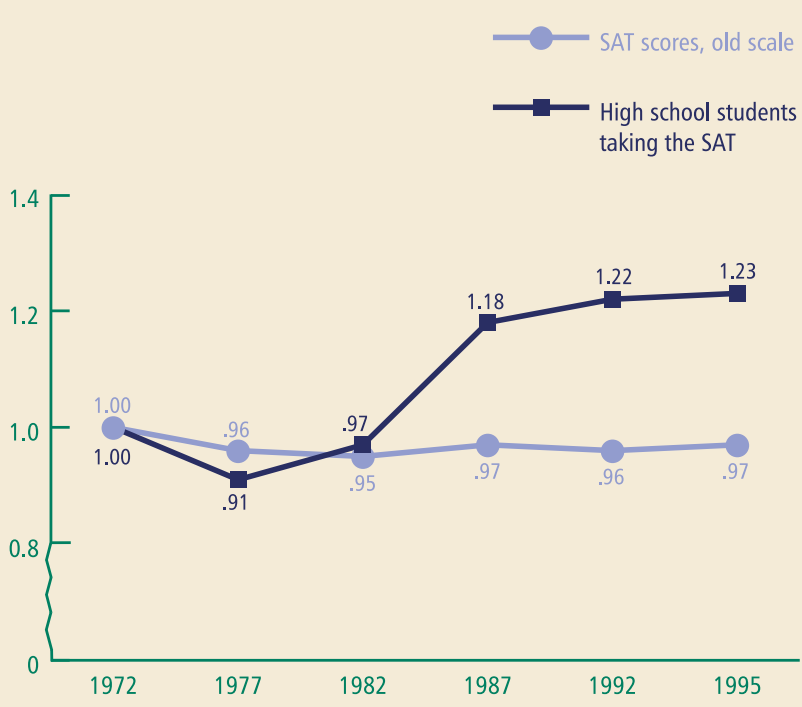
Many argue that the decline in SAT I scores is primarily a result of more students and more diversity among test takers; this is not accurate. Of the test takers in 2000, 66 percent were white, 9 percent Asian, 11 percent black, and 9 percent Hispanic. The number of minorities taking the SAT I has increased, and so have their scores. In fact, minorities are the only subset making distinctive gains on their SAT I scores. For example, minorities made up 31 percent of SAT I test takers in 1995, double the proportion of minorities taking the SAT I in 1976, the first year this statistic was recorded. During this period (1976–95), black students' SAT I scores increased 24 points in verbal and 34 points in math, whereas white students' scores declined 3 points in verbal and increased only 5 points in math. (See table 3.20 and figures 3.11 through 3.13.)[52]

Table 3.20: **SAT I Scores of College-Bound Seniors By Race/Ethnicity, 1976–95**

Year[a]	White	Black	Hispanic	Asian	Native American
1976	944	686	773	932	808
1977	937	687	766	919	811
1978	931	686	755	911	806
1979	927	688	757	907	807
1980	924	690	765	905	816
1981	925	694	770	910	816
1982	927	707	779	911	812
1983	927	708	777	909	813
1984	932	715	780	917	817
1985	939	722	793	922	820
1986[b]	na	na	na	na	na
1987	936	728	794	926	825
1988	935	737	796	930	828
1989	937	737	801	934	812
1990	933	737	797	938	825
1991	930	736	794	941	830
1992	933	737	795	945	837
1993	938	741	798	950	847
1994	938	740	798	951	837
1995	946	744	804	956	850

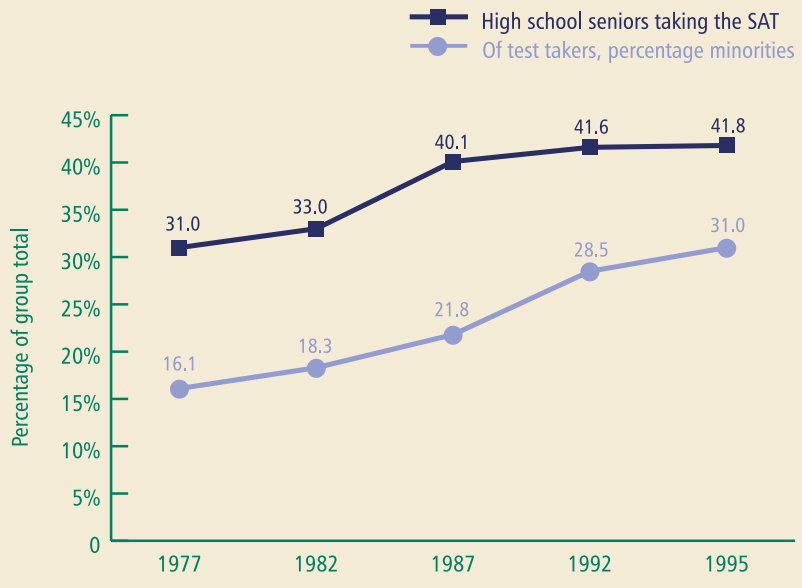
Source: U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 22-2, available online at http://nces.cd.gov/pubsold/ce96/c9622d02.html.
Notes: College-bound seniors, including graduating seniors participating in the college Board Admissions Testing Program, not including all first-year college students or all high school seniors. Old scale scores.
a. The first year for which SAT scores by racial/ethnic group are available is 1976.
b. Data were not collected by racial/ethnic group in 1986.

Figure 3.11: **SAT I Scores and SAT I Test Takers**



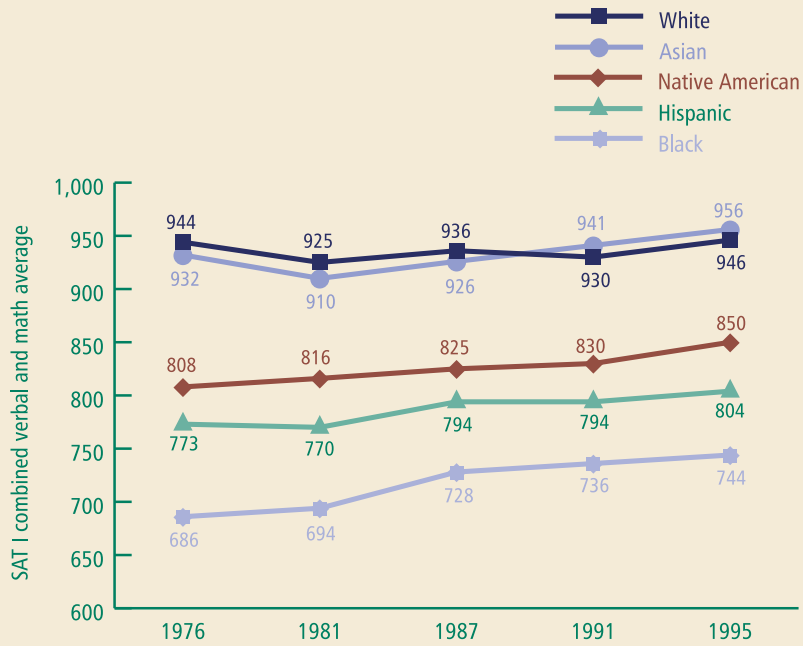
Source: U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 22-1, available online at http://www.nces.ed.gov/pubsold/ce96/c9622d01.html.
Note: Old SAT scoring scale.
Re-scaled: 1972 data = 1.0.

Figure 3.12: **SAT I Test Takers**
Graduating Seniors and Minorities, 1977–95



Source: U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 22-1, available online at http://www.nces.ed.gov/pubsold/ce96/c9622d01.html.
Note: Old SAT scoring scale.

Figure 3.13: **SAT I Scores of College-Bound Seniors By Race, 1976–95**



Source: U.S. Department of Education, *The Condition of Education 1996,* Supplemental table 22-2, available online at http://www.nces.ed.gov/pubsold/ce96/c9622d02.html.
Note: Old SAT scoring scale.

Although there were periods of modest improvement in the mid-1980s and then again in the mid- and late 1990s, overall SAT I scores still have not reached the levels they were at in the early 1970s.[53] If students were maintaining achievement levels, the number of students scoring above 600 on the verbal portion should increase as the number of students taking the test increases; this is not the case. In 1972, 112,530 of students (11 percent) scored above 600 on the verbal section of the SAT I; in 1995, only 85,440 (8 percent) scored above 600. In

mathematics, the percentage of students scoring 600 or higher did increase, from 17 to 21 percent.[54]

Has the value of the SAT I dissipated as a useful means of student assessment? Yes, according to Chester Finn and Diane Ravitch:

> The College Board's decision to 'recenter' the SAT I scores has considerably reduced the utility of those scores as a national barometer of the educational performance of college bound students. For some two decades, the SAT I has served this function, mainly because of its stable scale. The recentering however magically . . . gives the impression that the nation's educational deficit has been eliminated.[55]

In spite of drawbacks (the test is self-selective, lacks comparable scores from a variety of grade levels, and the range of subjects covered is limited to verbal and math), most experts feel that the SAT I is one basis for achievement comparison.[56]

A host of critics further argue that the SAT I should be dismissed because it is unfair to able students who do not perform well on fill-in-the-bubble tests, to those who belong to ethnic and minority groups and so are on uneasy terms with the cultural assumptions of the verbal SAT I, and to those whose parents are not rich enough to pay for the expensive SAT preparation courses that claim to raise scores.[57] Despite the SAT I's dissipated value, it is still one of the most useful tools colleges employ during the admissions process a 1997 study by the College Board showed that a combination of SAT scores and grades is a better indicator of student success in college than grades alone. Furthermore, records of 46,379 students at 55 colleges and universities across the country found that "for most ethnic groups the SAT alone is a better predictor of course grades than are high school grades alone." Of significance, for blacks, Hispanics, and Native Americans, "the SAT tends to

predict a slightly higher GPA than the students actually earn." A 1997 University of California study confirmed that if SAT scores were eliminated as admissions criteria, "white student eligibility would rise by 17 percent, Hispanic eligibility would rise only slightly, and black eligibility would fall by 18 percent."[58]

SAT I data now confuse many who make intertemporal comparisons in secondary education achievement. Moreover, potentially misleading conclusions may have been drawn and may have long-term consequences. If it appears students are doing better when they're actually doing worse, it may be doing students and the education system more harm than good. Claiming a score of 1010 when the old score would have been 910 provides a false sense of security when it comes to achievement.[59]

Proposition: Remedial education at postsecondary institutions is evidence that the K–12 education system is falling short.

Remedial education at the collegiate level has become a topic of concern for many. Alarming reports of high enrollment in remedial courses are at the fore, as are discussions as to why such enrollment percentages are high and how to reduce the numbers. The data, however, are confusing. Nationwide remedial course offerings at the collegiate level peaked in the 1996–97 school year and have since begun a steady decline. Despite these reported "improvements," postsecondary remedial enrollment is still high. In 1998, an average of 36 percent of students new to higher education were enrolled in at least one remedial course. High remedial enrollment rates are evidence that our K–12 education system is not preparing students adequately for future education opportunities. (See table 3.21.)[60]

Table 3.21: **Degree-Granting Institutions Offering Remedial Services**
1990–91—2000–01

	1990–91	1996–97	2000–01
All 4-year colleges	70.6%	80.0%	75.1%
Public	83.5	85.1	81.7
Private	65.6	68.6	67.9
All 2-year colleges	88.4	91.0	80.4
Public	98.9	99.2	99.7
Private	65.5	68.4	48.8
Total	**77.7**	**80.0**	**75.1**

Source: Thomas D. Snyder, ed., *Digest of Education Statistics, 2001* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, 2002), table 313, p. 356.

What's being said and done about postsecondary remedial education? Many states are concerned about their high remediation rates and have begun aggressive campaigns to reduce them. California is one example. California's state university system, one of the nation's largest university systems (with more than 350,000 students), has pledged to reduce the proportion of entering freshmen who require remediation to 10 percent by 2007; in 2001, more than 50 percent of its incoming freshmen required remediation in mathematics or English. The Cal State system's numbers are high when compared to the national average of approximately 35 percent; however, when the number of students whose second language is English are accounted for, the Cal State University remediation rates are more in line with national figures.[61]

In fall 2000, based on placement exams that determine who is assigned to remedial education classes, 62 percent of first-time freshmen required remediation, 20,890 students out of 33,822. In the Cal State system, 81 percent of those enrolled in remediation class had gained full proficiency before the second year.[62]

Cal State's remedial education students do confirm theories of K–12 shortcomings. According to university statistics, those needing remediation typically graduated from high school with a B average (3.2 GPA) and in the top third of their class. The Cal State system is now working with high schools statewide to reach its goal. Although improvements can be seen, reducing the percentage of freshmen who require remediation to 10 percent by 2007 seems optimistic. (See table 3.22.)[63]

Table 3.22: **California State University Freshman Remediation Rates**
1997–2001

Ethnicity	Math remediation		English remediation	
	1997	2001	1997	2001
American Indian	55.0%	49.5%	34.0%	39.4%
Black	80.0	74.5	64.0	64.4
Mexican-American	71.0	64.8	65.0	64.6
Other Latino	68.0	64.5	57.0	58.1
Asian-American	43.0	35.5	66.0	63.5
Pacific Islander	51.0	47.1	41.0	51.4
Filipino	54.0	46.4	56.0	53.8
White non-Latino	47.0	36.7	28.0	27.8
Nonresident	35.0	34.7	80.0	76.5
Unknown	51.0	44.8	37.0	39.7
Total	**54.0**	**46.2**	**47.0**	**46.2**

Sources: U.S. Department of Education, *Remedial Education at Higher Education Institutions in Fall 1995* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, October 1996), available online at http:/www.nces.ed.gov/pubs/97584.html; Christopher Shults, *Remedial Education: Practices and Policies in Community Colleges* (Washington, DC: American Association of Community Colleges, January 2001), available online at http://www.aacc.nche.edu/initiatives/issues/Remedial.pdf.

Proposition: The emphasis on community service in K–12 education has clearly increased; its impact is more difficult to measure.

Involving America's students in community service activities is one of the objectives established under the third National Education Goal for the year 2000, which seeks to prepare students for responsible citizenship.

> All students will be involved in activities that promote and demonstrate good citizenship, good health, community service, and personal responsibility.[64]

Over the past 10 years, legislative initiatives have responded to and galvanized a growing national emphasis on increasing students' involvement with their local communities and linking this service to academic study. This is service-learning, curriculum-based community service that integrates classroom instruction with community service activities, and it may be mandatory. In addition to their study of soil and water composition, for example, students in a science class preserve the natural habitat of animals living at a local lake by keeping the area clean and by posting signs educating the public. Community service is defined as community service activities that are not curriculum based and are recognized by or arranged through the school. It may be mandatory or voluntary.[65]

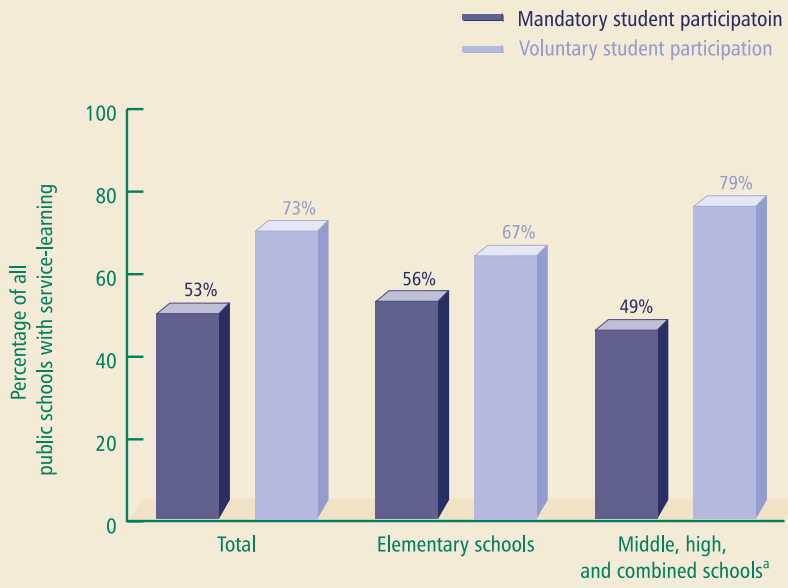
Examples of initiatives that have mandated support for service-learning activities in elementary and secondary schools include the National and Community Service Act of 1990, the Serve America program, the National and Community Service Trust Act of 1993, and the Learn and Serve America program.[66] Proponents of service-learning and community service

argue that involvement in service-learning enhances education, revitalizes communities, and teaches the importance of community participation and democratic values.[67]

While community involvement is clearly an important aspect of good citizenship, it is not apparent that this emphasis and participation make for a better education. The opportunities for involvement may have increased, but the academic benefits are less obvious.

- In 1984, approximately 9 percent of all high schools offered some form of service-learning; in 1999, roughly 46 percent of public high schools had incorporated some service-learning activities.
- In 1984, 27 percent of high schools offered community service opportunities to their students; in 1999, 83 percent of public high schools were doing so.
- In 1999, 32 percent of students in grades 6 through 12 reported that at least part of their community service experience was incorporated into their curriculum in some way. Of the 32 percent, 49 percent stated some components were mandatory, and 79 percent stated some components were voluntary. (The percentages of students reporting mandatory and voluntary student participation do not sum to 100 because many schools had both mandatory and voluntary student participation. (See figure 3.14.)[68]
- In the year 2001, the total number of students engaged in community service in North America was roughly 13 million.[69]

Figure 3.14: **Public Schools with Service-Learning 1998–99**



Source: Chris Chapman and Rebecca Skinner, *Service-Learning and Community Service in K–12 Public Schools* (Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, September 1999).
Notes: Data presented in the chart are based upon the number of schools having service-learning, which is 32 percent of sixth- through twelfth-grade public schools. Many schools had both mandatory and voluntary student participation.
a. Combined schools contain both elementary and secondary grades. The highest grade in such schools must be at least ninth grade.

Findings indicate that the propensity for sixth-through twelfth-grade public school students to participate in community service remained relatively flat from the 1970s through the early 1990s but has increased slightly in the mid- to late 1990s, perhaps due to the strong emphasis from legislators and others.[70]

- In 1999, 52 percent of sixth-through twelfth-graders had participated in community service within the previous year; in 1996, 49 percent had participated.[71]
- Some 56 percent of students who participated regularly in community service said that their service was incorporated into the school curriculum in some way (service-learning).[72]

It is difficult to gauge whether voluntary community service has actually increased because of the large influx of school programs that now have mandatory community service. Evidence suggests, however, that students are more likely to participate when the opportunity is provided but less likely to voluntarily seek out opportunities of their own accord. For example, students' participation rates in schools that required and also arranged community service were higher than participation rates in schools that only required it.[73]

Does community involvement contribute to a better-educated populace, or are we cheating our students by not spending enough time on the basics? Achievement over the last decade has remained flat, and students' community involvement has increased marginally, despite the heavy emphasis. Most would agree that community involvement is important; however, the proper context for participation might be less obvious. One of the primary purposes of K–12 education is to make sure that students are well equipped to contribute as citizens; however, students must also know the basics—reading, writing, and arithmetic—if they are to be prepared to contribute to their communities.

Chapter Notes

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