

Handbook of

ASIAN AMERICAN

PSYCHOLOGY

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ACADEMIC ACHIEVEMENT
AND PERFORMANCE

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Starting in the 1980s, the American public has been exposed to a spate of media reports about high levels of achievement on the part of Asian Americans in a number of fields. The focus most often has been on academic achievement of young Asian Americans. Each spring, pictures of National Merit Scholars, Presidential Scholars, and Westinghouse Science Talent Search finalists with Asian faces have smiled from their hometown newspapers. Success stories about the growing presence of Asian American students on this nation's most selective college campuses have been featured in print and broadcast media. Often there have been companion op-ed pieces that speculated on the etiology of Asian American academic success.

Polemicists have used such publicity to serve their own interests—to commend particular individuals or Asian groups, to chide or goad the majority or other minority groups, and sometimes to sow dissension among the increasingly diverse peoples in North America. Media and political attention, coupled with public concern about the deteriorating status of U.S. public education in an era of growing economic competition from other Pacific Rim nations, has contributed to widely held notions of Asian American students as super achievers and Asian Americans in general as a homogeneous “model minority” group. Media attention is one factor leading to a growing backlash, reflected in symptoms such as expressions of distrust or hatred, evidence of institutional discrimination, acts of violence against Asian Americans, and anti-immigrant legislation.

How much of the information we hear on radio, see on television, or read in the press about Asian American academic achievement is valid, and what ought to be relegated to the realm of folk myth? This chapter reviews recent literature

and examines available databases to describe the current status of Asian American academic achievement. The first myth to be examined is the notion that Asian Americans constitute a uniformly high performance group.

DEMOGRAPHICS OF DIVERSITY

Far from being a homogeneous model minority group, "Asian American" is an umbrella term that covers all peoples whose origins could be traced to Asia or the Pacific Islands. Asians and Pacific Islanders (APIs) were grouped together for bureaucratic convenience in census counts and other databases. Over time, Asian Americans have learned to form alliances to advance common interests.

There have been remarkable changes in both size and composition of the Asian American population since the enactment of two laws: the Immigration and Naturalization Act of 1965 and the Civil Rights Act of 1964. The former allowed Asian immigrants entry to the United States after having been shut out for decades through a series of Asian exclusion laws. The latter opened up educational and economic opportunities that had been long denied members of minority groups including Asian Americans. The legislation freed those already in this country from more than a century of legally sanctioned discrimination that ensured prolonged and severe curtailment of APIs' access to citizenship, housing, education, and jobs.

New immigrants arrived from Asia in substantial numbers from 1968 onward, when liberalized Eastern Hemisphere quotas set by the Immigration and Naturalization Act took effect. Since 1975, the end of the war in Vietnam, waves of Southeast Asian refugees have landed via a series of parole authorizations granted by the U.S. attorney general. The number of Asian Americans has grown more than fivefold in 25 years, from 1.4 million in 1970 to 7.5 million by 1995, when Asian Americans constituted just over 3% of the total U.S. population (U.S. Bureau of the Census, 1993).

Asian Americans were much more heterogeneous than they had been in the past. The 1990 census counted 17 specified Asian groups as well as 8 Pacific Islander groups. Table 10.1 shows counts and proportions for the 11 largest groups in 1990 in comparison to their corresponding numbers a decade earlier. The relative proportions of ethnic groups under the API rubric also have changed. The Japanese American population had been augmented by only a handful of immigrants in the interval between census counts, so their relative proportion in the total API population has fallen. Chinese, Asian Indian, and Filipino Americans, on the other hand, had substantially increased their numbers and have become proportionally larger segments of the API population. Immigration has doubled the 1980 Korean American population, whereas Vietnamese have tripled their population during the interval. Percentage changes over time are difficult to estimate because earlier census counts did not include the same groups.

One implication of changing patterns of population growth is that to understand puzzling phenomena such as the disparity between verbal and quantitative

TABLE 10.1 Asian American Population Counts and Percentage Distributions, 1980 and 1990

	1990		1980	
	Number	Percentage	Number	Percentage
Total	7,273,652	100.0	3,726,440	100.0
Chinese	1,645,472	22.6	812,178	21.8
Filipino	1,406,770	19.3	781,894	21.0
Japanese	847,562	11.7	716,331	19.2
Asian Indian	815,447	11.2	387,223	10.4
Korean	798,849	11.0	357,393	9.6
Vietnamese	614,547	8.4	245,025	6.6
Laotian	149,014	2.0	52,887	1.4
Cambodian	147,411	2.0	16,044	0.4
Samoan/ Guamanian/Tongan	129,915	1.8	76,441	2.1
Thai	91,275	1.3	45,279	1.2
Pakistani	81,371	1.1	15,792	0.4
Other	546,021	7.5	219,953	5.9

SOURCES: U.S. Bureau of the Census (1991) and O'Hare and Felt (1991).

achievement, one must take into account substantial differences within some ethnic groups that included high proportions of newcomers. Students of the same ethnic groups presented different profiles of typical performance, with those of limited English proficiency (LEP) typically holding their own in quantitative tasks while having difficulties with verbal tasks. In addition to recency of migration, achievement differences between individuals, as well as within and among groups, should be considered in terms of disparities in educational experiences and socioeconomic background before and after their arrival in the United States. Educated, English-proficient immigrants, given preferential status for their professional or technical expertise, are more likely to adapt quickly to new living conditions and educational or occupational changes. Individuals and families from preliterate societies, who might have spent years in refugee camps, would need more time and greater effort before they could find their niche in American society. Diversity in national origin, ethnic identity, socioeconomic background, and experiences after arrival in the United States differentiated immigrants and refugees from each other and from native-born Asian Americans. Another myth holds that all API youths are model minority students. Let us examine the validity of this myth by looking at empirical data.

ACHIEVEMENT IN ELEMENTARY AND SECONDARY SCHOOLS

Information about the achievement of specific Asian American groups remains scarce. Small sample sizes and/or biased sampling procedures of some published studies diminish validity of findings. Therefore, results from such studies should

be interpreted with caution. Validity coefficients of assessment instruments for measuring true developed abilities and achievement were not always available. Despite these limitations, there have been trends across a variety of assessment methods that have shown consistently strong performance in mathematics achievement and lower than average scores in language achievement tasks among Asian American students at elementary and secondary school levels.

The National Education Longitudinal Study of 8th Graders in 1988 (NELS:88) is the most recent national longitudinal study undertaken by the National Center for Education Statistics of the U.S. Department of Education. The base year survey in 1988 included achievement measures in four areas—reading and vocabulary, mathematics, science, and social studies—for a national representative sample of 8th graders. There also was a second-stage selection to obtain supplemental samples of Hispanic and Asian American students. Students judged by their schools to have had LEP were systematically eliminated from base year data collection, but subsequent follow-up surveys have included some LEP students. The base year sample of 1,500 Asian American 8th graders was large enough to permit some reporting of achievement scores by subgroups. Table 10.2 shows sample sizes and mean Achievement Test scores for nine Asian American groups and for their White, Black, and Hispanic peers. There were significant variations in mean Achievement Test scores by subgroups. Seven Asian subgroups' mean standard scores in reading were above the national average, and eight Asian subgroup means in mathematics were above the national average standard score. Pacific Islander pupils reported the lowest reading score among all racial/ethnic groups. This subgroup recorded low mathematics scores as well. Because LEP pupils were eliminated from the base year sample, the reported reading scores of those Asian subgroups with substantial proportions of newcomers who have acquired some knowledge of English would have been spuriously high if a truly representative sample had been included. Lumping Asian Americans together as a group, as most published reports have done, certainly masked problems and educational needs among some subgroups, particularly Southeast Asians and Pacific Islanders (Peng & Lee, 1991).

Continuing differences in achievement, particularly in reading, were observed among six Asian American groups during the second follow-up survey of NELS:88, conducted in 1992, when the students were in the 12th grade. The differences were associated with nativity and socioeconomic factors among 961 high school seniors identified as ethnically Chinese, Filipino, Korean, Southeast Asian, South Asian, or Japanese (Kim, 1997). Three out of four Southeast Asian and Chinese seniors were foreign born, compared to 71% of Filipino students who were native born. Native-born seniors recorded higher reading scores than did their foreign-born peers. The native-born students also reported more extracurricular activities and believed in efficacy of hard work. Their parents had more education and held higher status jobs than did parents of the foreign-born students. The parents of the native-born students had higher educational aspirations for, and discussed college plans more often with, their offsprings. Approximately 66% of foreign-born seniors recorded standardized mathematics scores above the 50th percentile

TABLE 10.2 Achievement Test Score of 1988 8th Graders, by Race/Ethnicity

Race/Ethnicity	Reading	Mathematics	Sample Size
Hispanic	46.01	45.70	3,170
Black	44.62	43.82	3,007
White	51.72	51.81	16,316
American Indian	44.33	44.67	299
Asian American	51.35	53.79	1,501
Chinese	52.19	56.72	309
Filipino	51.66	52.03	288
Japanese	52.75	56.33	92
Korean	55.06	58.24	187
Southeast Asian	49.42	52.56	240
Pacific Islander	42.86	44.91	99
South Asian	55.13	56.73	126
West Asian	53.15	56.38	33
Middle Eastern	51.36	54.06	42
Other	50.19	51.13	88

SOURCE: U.S. Department of Education (1988).

NOTE: The scores are standardized with a national mean of 50 and a standard deviation of 10. Southeast Asians included Vietnamese, Laotians, Cambodians, Thais, and so forth. Pacific Islanders included Samoans, Guamanians, and so forth. South Asians included Asian Indians, Pakistanis, Bangladeshis, Sri Lankans, and so forth. West Asians included Iranians, Afghans, Turks, and so forth. Middle Eastern included Iraqis, Israelis, Lebanese, and so forth.

of all NELS:88 students, compared to 65% of native-born Asian American seniors who did so. The foreign-born students spent more time on homework, reported better school attendance records, and believed that good luck was more important than hard work.

South Asian students, ethnically Indian and Pakistani, were most likely to be socioeconomically advantaged, with more educated parents and higher family incomes and occupational status. South Asian parents held higher educational aspirations for their offsprings and discussed grades and college plans with them more often. South Asian students recorded the highest reading scores, followed by Korean, Filipino, Chinese, Japanese, and Southeast Asian students. South Asian seniors also had the highest mathematics achievement scores, followed by Chinese, Korean, Japanese, Filipino, and Southeast Asian students. Southeast Asian students reported the lowest family socioeconomic indicators among all Asian groups. In 1990, the median family income among all Asian Americans was \$41,251. Among Cambodian, Laotian, and Hmong families, median incomes were reported by the census as \$18,126, \$23,101, and \$14,327, respectively.

NELS:88 follow-up data show that group differences in achievement observed in middle school continued through high school. These differences were associated with ethnicity and with generational and socioeconomic status.

National Assessment of Educational Progress (NAEP) is an ongoing survey of educational progress mandated by Congress. In the 1983-1984 and 1985-1986 periods, NAEP surveys that included language minority students were conducted by Educational Testing Service (Baratz-Snowden & Duran, 1987; Baratz-Snowden, Rock, Pollack, & Wilder, 1988). The 1983-1984 Reading Assessment used a stratified, three-stage sampling procedure to select nationally representative samples

of schoolchildren in the 4th, 8th, and 11th grades. Less than 2% of the pupils tested at each grade were Asians. Testing was done with a balanced incomplete block design, and score analyses used item response theory to estimate reading proficiency levels. A common scale was developed across grades with a range of 0 to 500, a mean of 250, and a standard deviation of 50.

Data from the Reading Assessment were undermined by the same problem as was NELS:88. Pupils whose English language proficiency was judged inadequate were excluded from participating in the Reading Assessment test, resulting in elevated mean score reports for Asian Americans, whose proportion of LEP pupils was higher than those of all other groups. The proportions of LEP pupils excluded from the survey ranged from 11% to 13% of Asians sampled in each grade. Among Asian Americans who did participate in the NAEP assessment, proportions of language minority status ranged from 41% in the 4th grade to 48% in the 11th grade. Asian pupils who mostly spoke a non-English language at home, weighted to yield population estimates, were 56%, 51%, and 74% of all language minority Asian pupils in the 4th, 8th, and 11th grades, respectively. Policymakers who base their decisions on aggregated data of Asian American pupils might not have been informed about Asian subgroup differences or the fact that LEP pupils were excluded from baseline data altogether.

Mean reading scores by grade of White and Asian students, classified by language status, are shown in Table 10.3. Reading performance also was reported as percentage of students at or above anchor points designated in five categories: rudimentary, basic, intermediate, adept, and advanced. In the 4th grade, 30% of English-proficient API students and 25% of English-proficient White students read at or above the intermediate anchor point of 250. Among language minority students, 25% of Asians who spoke mostly English at home and 10% of their White peers performed at the intermediate level or above. Among those who did not speak English at home, 18% of Asian and 6% of White pupils read at the intermediate level or above. Reported percentages were possibly overestimated for Asian and White language minority students because students with limited English were excluded.

In the 8th grade, 24% of Asian and 16% of White English-speaking pupils read at or above the adept level. In addition, 14% of Asian and 9% of White language minority pupils read at the adept level. Among students who spoke another language besides English at home, 7% of White and 6% of Asian pupils read at the adept level. In the 11th grade, 56% of English-speaking Asian students and 47% of White students were classified as adept readers, whereas 13% of Asian and 7% of White students were classified as advanced readers. Among language minority students, about one out of four White students, as well as Asian students, who spoke mostly English at home had attained adept or advanced reading levels. Among those who spoke another language at home, 22% of White and 17% of Asian pupils were adept or advanced readers. After controlling for background and process variables, Asian language minority students in the 4th and 8th grades were reported to read significantly better than language minority pupils from other groups (Baratz-Snowden & Duran, 1987).

TABLE 10.3 Mean Reading Scale Scores and Percentages of Pupils at Specified Reading Proficiency Levels of White and Asian Pupils by Grade and Language Status

	EP		LM		LM:SHL		LM:SE	
	n	Mean	n	Mean	n	Mean	n	Mean
4th grade								
White	11,214	226 (1.0)	442	204 (3.7)	218	198 (3.8)	217	210 (4.6)
Asian	175	227 (2.3)	217	226 (4.1)	122	221 (6.5)	92	233 (4.4)
8th grade								
White	12,494	267 (0.7)	316	251 (2.6)	150	249 (3.7)	163	254 (3.5)
Asian	171	270 (2.8)	181	268 (4.8)	98	256 (6.4)	83	281 (4.3)
11th grade								
White	13,511	296 (0.9)	277	274 (2.9)	144	271 (4.5)	125	280 (4.7)
Asian	233	305 (2.3)	213	269 (5.1)	152	262 (5.5)	56	291 (6.3)
% Reading Proficiency								
		Rudimentary	Basic	Intermediate	Adept	Advanced		
4th grade								
EP	White	98.5	76.2	25.1	1.6	--		
	Asian	96.5	74.4	29.9	3.4	--		
LM	White	93.2	53.8	10.4	0.2	--		
	Asian	98.6	75.3	24.7	2.7	--		
LM:SHL	White	91.1	46.4	6.2	--	--		
	Asian	97.4	70.5	18.4	2.2	--		
8th grade								
EP	White	100.0	97.4	70.1	15.5	0.3		
	Asian	100.0	97.8	72.2	20.4	1.4		
LM	White	99.6	90.5	53.9	8.6	--		
	Asian	100.0	96.6	71.7	14.3	0.8		
LM:SHL	White	100.0	90.2	51.1	6.6	--		
	Asian	100.0	94.4	56.1	6.3	--		
11th grade								
EP	White	100.0	99.4	89.3	47.0	6.5		
	Asian	100.0	99.1	93.5	55.6	13.2		
LM	White	100.0	96.3	75.5	21.9	2.9		
	Asian	100.0	96.4	66.4	21.6	2.6		
LM:SHL	White	100.0	96.2	73.5	20.5	1.9		
	Asian	100.0	95.96	1.41	6.5	0.5		

SOURCE: Baratz-Snowden and Duran (1987).

NOTE: Reading scale scores range from 0 to 500, with a mean of 250 and a standard deviation of 50. Standard errors are in parentheses. Proficiency levels are as follows: rudimentary, 150; basic, 200; intermediate, 250; adept, 300; and advanced, 350. EP = English proficient (pupils from homes where only English is spoken or where English is dominant); LM = language minority (pupils from homes where most people speak languages other than English); LM:SHL = speaks home language (language minority pupils who speak mostly in languages other than English at home); LM:SE = speaks English (language minority pupils who speak mostly English at home).

In the period 1985-1986, NAEP conducted a special survey of reading and mathematics performance of language minority Asian and Hispanic pupils in the 3rd, 7th, and 11th grades. On the whole, Asian students reported higher grades than did their Hispanic peers after controlling for background, language use, school attitudes, and school characteristics. Asian American pupils received higher

grades even when they performed at lower levels than some of their Hispanic classmates on assessment exercises, as they did in reading in the 3rd and 11th grades. Variables that explained the largest proportion of the differential in favor of Asian pupils included the following: having positive attitudes toward school, doing more homework, and taking more demanding courses (Baratz-Snowden et al., 1988).

A districtwide study of Southeast Asian pupils in San Diego schools also found higher grade point averages (GPAs) but lower Achievement Test scores among Asian pupils than among their White classmates. Vietnamese and ethnic Chinese pupils reported the highest GPAs, Hmong GPAs were slightly higher than those of White students, and Laotian and Cambodian pupils typically recorded grades at or below those of their White peers. In the 11th and 12th grades, reading test scores of Southeast Asian students were lower than all other group means except those of Samoans. Southeast Asian mathematics scores also were lower than those of their White classmates despite the fact that LEP pupils were not included in citywide testing programs. Higher grades coupled with lower Achievement Test scores support the hypothesis that teachers might have given greater weight to criteria other than grasp of subject matter.

Average proficiency in algebra and functions was reported for 8th-grade pupils from the 1990 NAEP assessment program (Mullis, Dossey, Owen, & Phillips, 1991). Relatively higher proportions of API pupils enrolled in 8th-grade mathematics, pre-algebra, or algebra than did their White, Black, or Hispanic classmates. Their average proficiency was consistently higher than that of their peers. In the 12th grade, proportions of all students who took algebra II, algebra III, or calculus were 1.3%, 0.7%, and 0.4%, respectively. Among Asians, the corresponding percentages were 4.7%, 3.6%, and 3.2%. Reports of higher mathematics achievement among API students in comparison to their White peers held true even when the former came from socioeconomically disadvantaged refugee families (Caplan, Whitmore, Bui, & Trautman, 1985).

In summary, findings from a current national representative longitudinal study (NELS:88) from cross-sectional studies such as the periodic NAEP reports, and from school district or special population studies, such as those of pupils in San Diego schools and of children from Southeast Asian refugee families, were consistent in their reports that most API students recorded higher mathematics performance at all grade levels than did their peers. Higher API achievement was related to completing more course work and taking more demanding courses in mathematics.

In language arts, API pupils presented more complex patterns of performance. LEP pupils were excluded from most assessment programs, and API students were more likely to have been classified as LEP than were students from other groups. Therefore, average Asian reading test scores were likely to have been higher than they would have been if all enrolled API pupils had been included. In elementary and middle schools, English-proficient API pupils did better than their peers, language minority Asian pupils who spoke mostly English at home

performed as well as or better than their classmates, but language minority Asian pupils who did not speak English at home did less well. Nevertheless, teachers assigned higher grades in language arts to their Asian pupils, even when those pupils' test scores were lower than those of their peers. API pupils reported that they did more homework and held more positive attitudes toward school than did their classmates, and these behavioral factors might have influenced their teachers' grading despite some Asian groups' lower performances when assessed by objective measures.

Staying in school is another criterion of pupil performance. Differential high school dropout rates have not always been taken into account in examining achievement among groups. The loss of data from student who dropped out because of inadequate prior schooling, LEP, or other social and economic handicaps could have spuriously elevated average achievement scores. Several school districts with high proportions of Southeast Asian refugees have reported rising dropout rates among API students. Boston Public Schools reported that dropout rates among Cambodian and Laotian students had more than doubled during the 1980s. Dropout rates of these two groups were rising faster than any other groups of students in Boston (Boston Public Schools, Office of Research and Development, 1986). Similar retention data have been reported among Hmong pupils in the Midwest (Podeschi, 1987). The 1980 census reported that 22% of Hmong and 31% of Laotians had graduated from high school compared to 67% of all U.S. citizens. Family values and parents' educational levels could have been factors in making high school persistence decisions.

The studies cited heretofore suggest that achievement differences reported among Asian subgroups might have been associated with differences in recency of migration as well as pre- and postmigration learning experiences. Furthermore, contrary to academic achievement measured by objective tests, Asian American pupils from all groups, including LEP pupils, typically received higher grades from their teachers than did classmates of all other racial, ethnic, and linguistic groups in language-related subjects as well as in mathematics. Reasons for teachers' favorable assessment of Asian Americans' ability to communicate in English, unsupported by objective measures of the latter's grasp of rules for standard written English or their writing samples, have not yet been investigated. Although effort might count in teacher evaluation of language arts performance, a "halo effect" from arithmetic performance—unwarranted, positive academic stereotyping of Asian pupils—cannot be ruled out as a reason for inflated grades from teachers.

HIGH SCHOOL GRADUATION AND COLLEGE ADMISSIONS TEST SCORES

The second follow-up survey of the NELS:88 cohort reported that about 9% of students who began 8th grade in 1988 had dropped out of school. Asian Ameri-

cans constituted 2% of all dropouts and 4% of the cohort who had graduated from high school in 1992 (Policy Information Center, 1995). Greater numbers of Asian Americans have been graduating from high school each year, in keeping with Asian population growth. In the 1985-1986 period, there were 62,000 Asian American public high school graduates, and 36,700 of those were from western states. By 1995, total Asian public high school graduates approached 98,000, with 55,400 from the West.

Proportionally more Asian American high school graduates continued on to college. Two thirds of Asian American high school seniors took the Scholastic Aptitude Test (SAT) each year. More APs also were sitting for the American College Test (ACT) in addition to or instead of the SAT. Academic qualifications and admissions test trends of Asian American applicants to colleges and universities have been reviewed elsewhere (Hsia, 1988). During the 1980s, public and private institutions, state departments that serve substantial Asian populations, and the U.S. Department of Education undertook a variety of studies on API qualifications for college and access to institutions of higher learning. A number of institutional and system studies were initiated by API students and communities. Other studies were undertaken by selective institutions in the spirit of self-examination. Some institutional studies began in response to charges by Asian students and their communities that there were growing restrictions that denied qualified applicants access to certain highly selective schools (Nakanishi, 1989).

It is reasonable to conjecture that recent rapid demographic changes could have been accompanied by changes in qualifications of typical college-bound Asian Americans, so let us examine score trends among college-bound Asian Americans in the 1990s. Tables 10.4 through 10.7 summarize Asian American and White performance on tests widely used to assist admissions officials in making admissions decisions.

Table 10.4 shows that White and Asian American males obtained higher mean scores than did females in Preliminary Scholastic Aptitude Tests/National Merit Scholarship Qualifying Tests (PSAT/NMSQT). Such gender-related phenomena, studied and reported extensively during the 1970s and 1980s, were found to be related to choice of high school courses. In addition, a higher proportion of young women chose to go straight on to college from high school, so that female test takers were a less select group than were males. Asian Americans typically scored slightly lower, about one fifth of a standard deviation, than did Whites in the verbal section. Asian American means were about one third of a standard deviation higher than White means in the mathematics section of the assessment program. The reported statistics were based on the entire population of test takers, not a random sample of the total, where statistical significance must be taken into account. Consistency of group performance patterns over time support the notion that differences were real.

Table 10.5 shows typical SAT performance of college-bound high school seniors by gender and ethnicity in 1990. Self-reported English-language status of White and API seniors showed that 94% of White students' first language was

TABLE 10.4 Average Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test Verbal and Mathematical Scores of Asian American and White College-Bound High School Juniors, 1990-1991

	Asian American			White		
	Male	Female	Total	Male	Female	Total
<i>n</i>	31,846	33,734	65,599	375,283	453,087	828,726
Verbal						
Mean	40.1	39.1	39.6	42.4	41.3	41.8
SD	12.2	12.0	12.1	10.0	9.7	9.8
Mathematical						
Mean	51.7	47.6	49.6	48.3	44.1	46.0
SD	12.8	12.0	12.6	11.4	10.2	11.0

SOURCE: College Board (1991).

English compared to 30% of Asian Americans. Their test results were similar to PSAT/NMSQT scores already described, with White students showing a modest advantage in verbal tasks and Asian American students doing somewhat better in mathematical tasks.

College Board's Admissions Testing Program (ATP) instruments have been modified during the 1990s. Wording of the Student Descriptive Questionnaire (SDQ) items addressing language proficiency was changed in 1990. Students were asked whether English was their *first* language instead of their *best* language. As a result, subsequent student response trends could not be validly compared to

TABLE 10.5 Average SAT Scores and First Languages of Asian American and White College-Bound Seniors, 1990

	Asian American			White		
	Male	Female	Total	Male	Female	Total
<i>n</i>	38,686	37,814	76,500	346,226	383,019	729,245
First language (percentage)						
English			30			94
English and other			27			4
Other			43			2
SAT verbal score						
Mean	413	406	410	447	438	442
SD	132	130	131	106	102	104
SAT mathematical score						
Mean	549	506	528	515	469	491
SD	132	128	132	119	110	117
Test of standard written English score						
Mean	39.3	40.6	39.9	43.7	45.3	44.6
SD	12.0	12.0	12.0	10.2	9.7	10.0

SOURCE: College Board (1990-1991).
NOTE: SAT = Scholastic Aptitude Test.

TABLE 10.6 Average SAT I Scores of College-Bound Seniors, 1995

	<i>n</i>	Percentage of Total	Verbal Mean	Mathematical Mean
American Indian	8,936	1	403	447
Asian/Pacific American	81,514	8	418	538
African American	103,872	11	356	388
Hispanic				
Mexican American	36,323	4	376	426
Puerto Rican	13,056	1	372	411
Other Hispanic	30,713	3	389	438
White	674,343	69	448	498
Other	25,113	3	432	486
Nonrespondents	94,123			

SOURCE: College Board (1995).

data from before 1990. SAT tests also have been altered. Since 1995, SAT scores have been based on the revised SAT I. The result was that, nationwide, more than half of all high schools experienced 1-year changes of school means of at least 10 points. In 1996, a change in score scale was introduced. Differences among groups in patterns of performance remained, as shown in Table 10.6. In 1994, the API mean mathematics score of 535 was higher than the White mean score of 495. The Asian mean verbal score was 416, lower than the White mean score of 443.

Delivery systems also were evolving, as automated computer testing and scoring gradually were replacing paper-and-pencil tests. ATP instrument changes were based on substantial bodies of program research and test theory. Nevertheless, the consequences of these changes were that cross-year comparisons no longer can be made with confidence either for the college-bound population as a whole or specific subgroups such as Asian Americans. Relative rankings of group performance on SAT I, however, remained the same as those of SAT. The 1996 SAT I mean verbal and mathematical scores of 505 and 508, respectively, were recorded for all college-bound seniors. The corresponding Asian American mean scores of 496 and 558 continued to show a pattern of slightly lower than average verbal scores and higher mathematical scores.

The 1995 ACT results for juniors and seniors who participated in the American College Testing Program during the 1994-1995 academic year, detailed in Table 10.7, showed patterns similar to those of ATP participants. Students who enrolled in college-preparatory core programs typically scored at higher levels than did their peers who signed up for fewer academic courses. More than two thirds of API participants of ACT had enrolled in core programs in high school compared to 6 out of 10 of their Caucasian peers and lower proportions among other minority classmates. Asian Americans scored higher than all other groups in mathematics and scored lower than their White peers in English and reading. The composite scores of White and Asian American students were virtually the same. Asian composite scores in 1991 and 1995 both were 21.5, whereas the

TABLE 10.7 Average American College Test Assessment Scores of 1995 High School Graduates

	African American	American Indian	Asian American	Mexican American	Puerto Rican	White
<i>n</i>	89,155	11,361	27,784	24,431	24,054	650,664
English	16.4	17.7	20.2	17.6	17.8	21.0
Mathematics	16.8	18.1	22.8	18.6	18.7	20.7
Reading	17.1	19.1	21.3	18.8	18.9	22.1
Science and reasoning	17.4	19.1	21.5	19.0	19.1	21.6
Composite	17.1	18.6	21.6	18.6	18.7	21.5

SOURCE: American College Testing Program (1995).

White composite score in 1995 was 21.5 and in 1991 was 21.3. English, reading, and science and reasoning are assessment exercises with substantial verbal components, which were more challenging for students whose best language was not English (American College Testing Program, 1995).

Data from national assessment programs of the ATP and ACT already described consistently recorded relative strength of Asian American high school students in measures of their developed mathematical abilities, accompanied by lower than typical White performance in verbal tests. These observations can be explained in large part by choice of courses during high school. Asian American students devoted greater amounts of time to mathematics classes, shown by self-reports of curricular choices. Asian Americans were more likely to report LEP related to home language use. Asian Americans also were more likely than their White classmates to be assigned to English as a Second Language classes rather than regular or honors English.

When test results have so consistently shown Asian Americans to do better than average in quantitative tasks and below average in verbal tasks, it is reasonable that questions about the validity of standardized testing programs to measure Asian American academic achievement have been raised by members of various Asian communities. Were assessments of communicative skills somehow systematically biased against Asians, whereas mathematics tests measured their true developed abilities?

Test scores have, in fact, been shown in reliability and validity studies to have been biased in favor of, or against, Asian American test takers in unexpected directions, particularly among those with LEP (Bleistein & Wright, 1985; Kulick & Dorans, 1983; Petersen & Livingston, 1982). The lower than average scores recorded by Asian American test takers in multiple-choice, objective English tests had, in fact, overestimated their performance in actual writing tasks such as composing essays. Compared to Whites and other minority peers, Asian American writing samples were less competent than would have been predicted from their test scores. If teacher grades were entered into the regression equation, the results would have been even greater overprediction of essay quality.

Although multiple-choice, standardized group-administered and machine-scored tests of standard written English have consistency overpredicted API performance in essay writing, Asian American students themselves were realistic about their own linguistic capabilities. They were more likely than their classmates to have rated themselves as low in writing and speaking skills in the Student Descriptive Questionnaire.

As for the higher than average mathematical test scores reported among APIs, particularly those of newcomers from East and South Asian nations that have dominated the top tier of international mathematics assessment programs, the typically above average test scores were, in fact, understating their true developed mathematical reasoning abilities. Validity studies using diverse methods and criteria have demonstrated that API test takers had trouble with story problems where difficulties with reading English slowed them down. Purely mathematical reasoning problems, on the other hand, were not speeded tests for APIs. Overprediction of college-level writing tasks by objective English usage tests and high school grades and underprediction of developed mathematical abilities by quantitative problems stated in English hold significant policy implications. Stronger preparation in communicative skills is needed by Asian newcomers if they are to realize their full potential. Their strengths in mathematics, engineering, and physical sciences, on the other hand, are likely to remain underestimated and therefore underutilized.

Sue and Abe (1988) examined high school grades, SAT scores, and Achievement Test scores as predictors of success, as measured by freshman-year GPAs. Participants were 4,113 API and 1,000 randomly selected White freshmen enrolled at eight University of California campuses in the fall of 1984. One third of the APIs reported that English was not their best language. Their numbers permitted analyses by subgroups—Chinese, Filipino, Japanese, Korean, other Asian American, and East Indian/Pakistani. The mean freshman undergraduate grade point averages (UGPAs) of APIs and White students were 2.74 and 2.75, respectively. For all APIs, three predictor variables—*HSGPA* (high school GPA), *SAT-V* (SAT-verbal), and *SAT-M* (SAT-mathematics)—yielded a multiple *R* of .498 with UGPA, higher than the White multiple *R* of .451. For Asian Americans, *SAT-M* contributed 36% and *SAT-V* contributed 3% to the prediction of college grades. For White freshmen, *SAT-V* contributed 32% and *SAT-M* contributed 3%. The multiple *R* of .545 among East Indians/Pakistanis was highest, and those of Koreans and Filipinos were lowest at .408 and .391, respectively. Similar results were found when Achievement Test scores were used as predictors instead of SAT scores. The multiple *R* for English best language APIs was .505 and for English not best language students was .490. Although *SAT-M* was superior to *SAT-V* as a predictor among both groups, the difference was not large for English best language APIs. If White regression equations were applied to APIs, then there would have been serious underprediction of UGPA for Chinese, other Asian, and English not best language students. On the other hand, Japanese, Filipino, and

English best language API students' UGPAs would have been overpredicted with the White students' regression equation.

HIGH SCHOOL CURRICULAR AND EXTRACURRICULAR ACHIEVEMENTS

Proportionately more Asian American high school students than their classmates fulfilled core academic requirements for college admissions, according to self-reports from ATP and ACT of 1990 and 1991, respectively. These and other surveys, including the National Longitudinal Study of the High School Class of 1972 (NLS-72), High School and Beyond (HS&B), and NELS:88, have recorded that Asian American students completed more advanced courses in mathematics and other quantitative subjects and earned higher high school GPAs. They also reported longer hours of homework and lower rates of absenteeism. APIs learned more between their sophomore and senior years, according to objective measures, and stayed the course to graduation (Peng, Owings, & Fetters, 1984; Rock, Ekstrom, Goertz, & Pollack, 1985). Asian Americans were three times as likely as their classmates to enroll in advanced placement programs to earn college credits during high school (Rothman, 1986).

As for extracurricular activities, APIs were less likely than their classmates to hold part-time jobs after school. Sports, the most popular choice of their peers, were less often chosen by Asian American students. API extracurricular participation was more likely to center on special academic interest clubs (e.g., science, classical music) and social, ethnic, or community organizations (Peng et al., 1984; Ramist & Arbeiter, 1986).

Apart from grades and rank in class, relatively more Asian American high school students than their peers reported having received honors and awards in academics and performing arts. Students from immigrant families garnered honors, particularly in areas that did not demand superb communicative skills. The Westinghouse Science Talent Search and the Arts Recognition and Talent Search reward excellence in science or mathematics research and in performing arts, respectively. Higher than expected numbers of Asian American students have been recognized by these programs. Perfect command of English is not a prerequisite for success in either of these awards. There were, in fact, high proportions of first- and second-generation Asian Americans among honorees and winners. National Merit honors and awards, on the other hand, use scores of PSAT/NMSQT as criteria. The verbal score (V) is given more weight than the mathematical score (M) in the selection process by using the formula $2V + M$. Among Asian American PSAT/NMSQT participants, 1 out of 10 have been recognized as semifinalists, finalists, or winners, but the proportion would have been even higher if the verbal and mathematical scores had been given equal weight in award decisions (Hsia, 1988).

TABLE 10.8 Average GRE General Test Scores and Language Proficiency of Asian American, White, and Total U.S. Citizen Examinees, 1987-1988

	<i>Asian American</i>	<i>White</i>	<i>Total</i>
<i>n</i>	6,133	173,674	203,084
Percentage of total	3	86	100
GRE scores			
Verbal mean	480	520	508
SD	127	108	114
Quantitative mean	612	546	536
SD	131	128	134
Analytic mean	539	557	543
SD	134	118	125
English best language ^a	80	99	97

SOURCE: Wah and Robinson (1990).

NOTE: GRE = Graduate Record Examination.

a. These data are from 1986-1987.

GRADUATE AND PROFESSIONAL SCHOOLS ADMISSIONS

The pattern of relatively higher performance by Asian Americans in quantitative areas of study and lower performance than White peers in verbal areas among the college-bound also was observed in graduate and professional school admissions test takers. Tables 10.8 through 10.14 show recent Asian American mean test scores and reported standard deviations of Graduate Record Examination (GRE), Graduate Management Aptitude Test (GMAT), Law School Aptitude Test (LSAT), and Medical College Aptitude Test (MCAT) programs for graduate, graduate management, law, and medical schools, respectively. Admissions test scores and undergraduate records, in combination with essays and interviews, remain widely used criteria for admissions decisions.

Asian American mean GRE scores from 1976 through 1983 showed a continuous trend of increasing GRE-Q (quantitative) scores and decreasing GRE-V (verbal) scores, whereas White mean scores remained stable. These score trends were very likely associated with the changing Asian demographics during this period, with growing proportions of students from immigrant and refugee families (Hsia, 1988). Asian Americans constituted 3% of GRE candidates in the 1987-1988 period, as shown in Table 10.8. Results included GRE-V, GRE-Q, and GRE-A (analytical) scores. Asian American GRE-V, GRE-Q, and GRE-A mean scores were 480, 612, and 539, respectively, compared to corresponding White means of 520, 546, and 557. Asian Americans typically found quantitative items to be easier and verbally loaded items harder in the analytic section of GRE (Wah & Robinson, 1990).

A more meaningful way of looking at GRE scores is by graduate field of study choices among test takers. For the period 1991-1992, mean scores of Asian American, White, and total male and female GRE candidates by fields of planned study, as shown in Table 10.9, supported the notion that informed choices for

TABLE 10.9 Mean Graduate Record Examination Scores of Asian American, White, and Total Examinees Planning Graduate Work by Fields of Study, 1991-1992

Area of Study	Asian American		White		Total	
	Male	Female	Male	Female	Male	Female
Arts and humanities						
Number of examinees	233	396	11,199	13,643	12,618	15,608
Mean verbal	591	546	578	565	573	557
Mean quantitative	603	562	554	511	550	506
Mean analytic	586	561	578	575	571	566
Physical sciences, mathematics, and computer sciences						
Number of examinees	433	216	7,144	3,052	8,286	3,728
Mean verbal	476	468	561	543	549	524
Mean quantitative	684	656	688	654	680	640
Mean analytic	555	558	632	638	619	515
Social sciences						
Number of examinees	389	739	12,928	22,340	15,278	26,569
Mean verbal	530	521	540	519	532	510
Mean quantitative	609	563	567	517	557	508
Mean analytic	561	563	569	564	558	552

SOURCE: Grandy (1994).

graduate fields were made based not only on undergraduate majors but also on candidates' self-assessments of their developed academic strengths and weaknesses. Students who planned graduate studies in the physical sciences, mathematics, or computer science typically scored the highest GRE-Q scores. Arts and humanities students had higher GRE-V scores. Social science students reported GRE-V, GRE-Q, and GRE-A scores in the same ranges (Grandy, 1994). Gender differences of total, White, and Asian American students were in similar directions. Highest mean GRE-Q scores were recorded among Asian American males who planned graduate studies in physical sciences, mathematics, or computer science. Highest GRE-V scores were recorded among Asian American males who planned to concentrate on arts and humanities. White and Asian American scores in GRE-V, GRE-Q, and GRE-A were very similar among those who planned to study social sciences. These scores suggest that relatively greater proportions of Asian Americans who planned graduate studies in quantitative fields were from newcomer families, whereas those who planned to concentrate on arts and humanities or social sciences were English-fluent second- or later-generation Americans.

GMAT scores are required by most graduate schools of management for admissions decisions. In the 1990-1991 period, 4.6% of GMAT takers identified themselves as Asian Americans. Table 10.10 shows that the Asian American mean total score was 499 compared to the White mean total score of 512 (Graduate Management Admissions Council, 1992). By the 1992-1993 period, Asian Americans had risen to 7.6% of all test takers with a mean score of 507 compared to a White mean score of 517 (Barton & Lapointe, 1995).

TABLE 10.10 Average Graduate Management Aptitude Test Scores of Asian American, White, and Total Applicants to Graduate Schools of Management, 1990-1991

	Asian American	White	Total
<i>n</i>	6,934	125,888	240,869
Percentage of applicants	4.6	83.8	100.0
Mean score	499	512	494

SOURCE: Graduate Management Admissions Council (1992).

LSAT scores are used by law schools as one criterion for student selection. In 1989, LSAT scores were reported for 1,687 Asian American law school applicants. They constituted 4.2% of all applicants that year. As shown in Tables 10.11 and 10.12, the Asian American mean score of 32.16 was close to the White mean score of 33.33 (Wightman & Muller, 1990). In June 1991, the LSAT format was changed. The test included four section scores with logical reasoning items constituting one third to one half of the total and required a writing sample. By 1995, Asian American law school applicants had tripled their numbers to 5,402, or 6.4% of the total. The LSAT introduced a new score scale of 120 to 180 with mean of 150 and standard deviation of 10. The Asian American mean of 152 was the same as the total applicant mean and was very close to the White mean of 154. The LSAT mean of Asian Americans who were admitted to at least one American Bar Association-approved law school was 156, with 156 being the mean of all admissions and 157 the mean of White admissions. Asian Americans constituted 6.5% of all admissions and 6.2% of 1995 law school matriculants (personal communication, LSAC Research Department personnel, 1996). As in the case of graduate school applicants, self-selection was evident among Asian American applicants and their White and other minority peers. Few API college graduates of LEP would aspire to the law, which values eloquence.

MCAT scores are used by most medical schools as criteria for admissions. Table 10.13 shows that in 1990, more than 4,000 Asian Americans took the MCAT. They comprised 15% of all MCAT registrants. Asian Americans scored higher than White test takers, as well as all test takers, in four out of six areas: biology, chemistry, physics, and science problems. The mean reading and quantitative

TABLE 10.11 Comparison of LSAT Performance Among Selected Subgroups of Test Takers in September-1989

Subgroup	<i>n</i>	Percentage	LSAT mean	LSAT SD
Asian/Pacific Islander	1,687	4.2	32.1	68.74
Black/African American	2,183	5.5	24.11	8.44
Caucasian/White	31,539	78.8	33.33	7.54
Hispanic	866	2.2	28.68	8.68
Puerto Rican	241	0.6	25.68	9.73
Mexican American	445	1.1	27.89	8.56

SOURCE: Wightman and Muller (1990).
NOTE: LSAT = Law School Aptitude Test.

TABLE 10.12 Means and Standard Deviations of Law School Aptitude Test Section Scores of Asian American and White Test Takers, September 1989

	Analytic Reasoning	Reading Comprehension	Logical Reasoning
Asian/Pacific Islander (<i>n</i> = 1,687)			
Mean	18.83	19.78	20.98
SD	5.63	5.3	15.54
Caucasian/White (<i>n</i> = 31,539)			
Mean	18.45	20.66	22.34
SD	5.38	4.82	4.79
Percentage of Asian scores > Caucasian median score			
	54.03	45.64	42.70

SOURCE: Wightman and Muller (1990).

skills analysis scores of Asian Americans were lower than those of Whites and of all test takers (Association of American Medical Colleges [AAMC], 1992). This pattern was similar to Asian American performance on the MCAT a decade earlier, when their numbers were about one half of those in 1990. Medicine remains the top professional choice of Asian American college graduates. A much higher proportion of APIs had fulfilled requirements for admission to medical schools in comparison to their peers. In 1985, APIs constituted 8.2% of all medical college applicants. By 1995, they comprised less than 5% of new college graduates but 20.7% of medical school applicants (AAMC, 1996).

TABLE 10.13 Average Medical College Aptitude Test Area Scores of Asian American, White, and Total American Medical School Applicants, 1990

	Asian American	White	Total
<i>n</i>	4,345	19,871	29,243
Percentage	14.9	68.0	100.0
Area scores			
Biology			
Mean	8.38	8.18	7.94
SD	2.42	2.33	2.45
Chemistry			
Mean	8.51	7.70	7.60
SD	2.44	2.32	2.40
Physics			
Mean	8.51	7.81	7.64
SD	2.50	2.36	2.47
Science problems			
Mean	8.31	7.78	7.59
SD	2.44	2.30	2.39
Skills analysis			
Reading			
Mean	7.0	7.96	7.41
SD	2.59	2.19	2.51
Quantitative			
Mean	7.37	7.70	7.26
SD	2.46	2.28	2.46

SOURCE: Smith and van der Veen (1991).

Despite completion of more medical college admissions prerequisites, higher than average UGPAs, and competitive MCAT scores, 1994 API acceptance rates were lowest among all groups in 1994, as shown in the following table:

	Percentage Applicants	Percentage Matriculants
Asian Americans	18.4	16.4
Blacks	7.9	8.2
Other underrepresented minorities	3.1	4.3
Other Hispanics	3.0	3.0
Whites	62.9	63.7

Nevertheless, APIs comprised 14.4% of total U.S. medical school enrollment by 1991 (Smith & van der Veen, 1991) and 18.2% by 1995, after the MCAT format had been revised to emphasize communicative skills (AAMC, 1996). Beginning with the 1992 academic year, the MCAT format was changed to place more emphasis on verbal reasoning and writing skills. Two essays were required. The AAMC reporting format of the MCAT and medical school enrollment data also changed. Bar and pie charts replaced tables (AAMC, 1996). Although graphics are more intuitively readable than tables, they did not provide fine details. AAMC research and assessment staff have published few numbers. The graphs showed slightly wider variations among API applicants' performance in comparison to their White peers, but central tendencies of Whites and APIs were close. Mean 1995 verbal reasoning scores of Asian and White applicants were 9.55 and 9.85, respectively, with the median of both groups being 10.00. The mean UGPAs of Asians and Whites were 3.59 and 3.56, respectively (AAMC, personal communication from Danielle Masters, September 11, 1996). These patterns were similar to data of these groups before 1992.

Like law school applicants, medical school applicants are a self-selected, academically elite group. Profiles of all applicant groups are similar, and those of matriculants are more alike still. In 1994, mean science UGPAs of Asian applicants and matriculants were 3.28 and 3.56, respectively. Corresponding White means were 3.29 and 3.54. The matriculant mean science UGPAs of underrepresented groups ranged from 2.95 to 3.22. Overall UGPAs of API and White applicants were 3.35 and 3.36, respectively; for matriculants, the corresponding UGPAs were 3.59 and 3.56.

Verbal reasoning scores of API and White applicants were 8 and 9, respectively; among matriculants, both Asians and Whites scored 10. API applicants had to perform as well as or better than White peers to be accepted by at least one AAMC member college. By 1995, Asian and White students comprised 20.7% and 62.9%, respectively, of all medical school applicants. Asian and White matriculants comprised 18.2% and 64.9%, respectively, of the total.

The distribution of Asian American medical school matriculants has changed because verbal reasoning and writing skills are given greater weight in the MCAT. By 1994, Asian Indian/Pakistani was the largest subgroup among Asian American

matriculants, whereas Southeast Asians was the smallest subgroup (AAMC, 1994). Demographically, Asian Indians and Pakistanis together constitute a substantially smaller group than do Chinese or Filipino Americans. NELS:88 baseline data had shown that South Asian families were the best educated and held the highest-status jobs among all Asian American groups. Not only had English been an official language during the British raj, but Indo-European languages, which include English and South Asian languages based on Sanskrit, share common linguistic roots. Asian Indian and Pakistani, even recent brain drain immigrants, were more likely to do better than other Asian groups in English assessment exercises. Southeast Asian applicants to medical schools, by contrast, were most likely to have been recent arrivals, mostly from refugee families, some from preliterate communities. As a group, they were least likely to do well in tests of English language skills. Changes in the MCAT that emphasized communicative skills have resulted not only in the plateauing of API matriculants after a decade of growth but also in skewing admissions decisions in favor of South Asians and against recent arrivals including Southeast Asian applicants.

HIGHER EDUCATION ENROLLMENT

In spite of growing numbers of Asian Americans, especially new immigrants, who manifested inadequate preparation in communicative skills, overall Asian American achievement in higher education has remained above average in terms of enrollment, persistence, and degree attainment. In the decade between 1984 and 1994, Asian American enrollment in all higher education institutions had almost doubled, from 390,000 to 774,000. Their numbers have more than doubled in 4-year institutions, from 223,000 to 462,000. By 1994, API enrollment in public and private institutions had reached 622,000 and 152,000, respectively. There were 674,000 API undergraduates, 73,000 graduate students, and 28,000 professional school students. Carter and Wilson (1996) predicted slowing down of the rapid rate of growth seen during the 1980s, but API enrollment has continued to increase in line with demographic trends. More Asian American women are continuing on to tertiary educations. Their numbers grew by 40% between 1990 and 1994, whereas the men's numbers grew by 30%.

The Longitudinal Studies Program of the National Center for Education Statistics of the Department of Education has undertaken three studies: NLS-72, HS&B, and NELS:88. The goal of each study was to collect long-term information about educational opportunity and its long-term effects on individual growth in terms of education and careers.

NLS-72 sampled small numbers of APIs, and higher education enrollment analyses for NELS:88 Asian American students are not yet available at this time.

Higher education enrollment data were available for the 420 Asian American high school seniors and their peers who took part in HS&B. Virtually all Asian American participants obtained high school diplomas. Overall, more than 36% of study participants did not continue beyond high school. Among Asian Ameri-

cans, only 12% of participants failed to enroll in some type of postsecondary education during the following 4 years. A majority of HS&B Asian Americans chose to attend public institutions, 22% chose 2-year institutions, and 33% chose 4-year colleges and universities. About 12% began postsecondary schooling part-time (Owings, 1987).

Cross-sectional data confirmed findings from longitudinal studies. API enrollment in higher education institutions grew along with demographic growth. Between 1984 and 1994, Asian American enrollment at colleges and universities rose from 3.2% to 6.8% of all college students. Between 1993 and 1994, Asian American enrollment as undergraduates rose by 6.2%. API enrollment in graduate and professional institutions rose by 11.2% and 10.4%, respectively (Carter & Wilson, 1996).

Most Asian Americans live in metropolitan centers. More than half of Asian Americans graduated from high schools in the West. Of the 50 states, 9 reported more than 10,000 API students enrolled in higher education institutions by the fall of 1988. California headed the list, with more than 200,000 API students, followed by New York, Hawaii, Illinois, Texas, Massachusetts, Washington, New Jersey, and Pennsylvania (with 11,000).

The large pool of qualified Asian American aspirants to higher education has pressed the capacity of some institutions and departments to respond. Highly selective public and private institutions on both coasts, in particular, have been targeted by more applicants than expected. Among the growing number of newcomers with high aspirations, well-developed quantitative skills, but limited capability to communicate effectively in English, fields of study would be limited to engineering, physical sciences, mathematics, and quantitative areas of business. Among the most popular institutions and departments, proportions of Asian Americans enrolled substantially exceeded figures predicted by demographics alone.

Asian Americans in Los Angeles County comprised nearly 11% of the total population (Ong & Azores, 1991). The freshman class of the University of California, Los Angeles (UCLA), was 39% APIs that year. University officials cited both high eligibility and high application rates among Asian Americans as causes for the disproportionately large number of API matriculants (Salazar, 1994). Once admitted, proportionately more API students registered as UCLA freshmen. Admissions rates of API groups varied from each other and from both the majority and other minority rates. The American Indian admissions rate was highest at 71%, followed by those of Chicanos (66%) and African Americans (61%). These three groups together constituted 18% of 3,984 freshmen. Among API applicants, admissions rates were as follows: Chinese (55%), East Indians/Pakistanis (50%), Thais/other Asians (49%), Koreans (46%), Japanese (46%), Filipinos (39%), and Pacific Islanders (38%). University officials acknowledged complexity of admissions criteria, with weights given to ethnicity, socioeconomic factors, and other variables.

Asian American students were more likely than their peers to enter higher education without financial aid, even though their financial resources were no better than those of other students (Peng, 1985, 1990). About half of API students

used earnings and/or savings to pay for college. About a quarter received Pell grants. Asian Americans were less likely than other students to receive any type of financial aid in the form of grants or loans. Once enrolled in college, were there observable patterns among groups in course-taking behavior, grades earned, or persistence? Among 1980 HS&B seniors who were tracked, average months of persistence and percentage persisting normally for 8 or 9 months (in parentheses) at each type of higher education institution are shown in the following table:

Group	Public 2-Year Institution	Public 4-Year Institution	4-Year Private Institution
Asians	8.5 (85.4)	9.0 (99.6)	9.0 (99.4)
Blacks	7.5 (69.7)	8.4 (88.0)	8.5 (89.5)
Hispanics	8.1 (81.2)	8.3 (85.1)	8.6 (89.5)
Whites	7.9 (77.0)	8.5 (90.1)	8.7 (94.0)

Asian American students typically spent more time in all types of institutions and were more likely to persist throughout the normal academic year (Owings, 1987).

During the second year after high school graduation, Asian Americans who persisted during their freshman year were more likely than their peers to return to college. Only 1% of Asian Americans failed to reenter postsecondary education in the 1981-1982 academic year compared to 6%, 9%, and 12% among White, Black, and Hispanic peers, respectively. There were fewer dropout or "stopout" API college students during their initial 4 years of postsecondary schooling. About one third of Asian Americans persisted normally compared to one fifth of White peers. Among Black classmates, 13.5% showed a normal 4-year persistence pattern. Less than 1 out of 10 Hispanic peers persisted normally (Owings, 1987).

The sample size of HS&B Asian American seniors in 1980 did not allow analysis by Asian subgroups. Some persistence data among API subgroups, however, have been reported for students who enrolled as new-from-high-school freshmen at the University of California, Berkeley (Frank, 1988). These data were from a single selective, public 4-year institution and cannot be generalized to other regions or institutions. They are included here because the data were reported for all API students at Berkeley, were reliable and valid, and were in numbers sufficient for subgroup tabulations. In the 1980-1981 academic year, the 1-year retention rate for new-from-high-school freshmen was 87% overall. Group retention rates ranged from 65% among American Indians to 92% among Asian Americans (excluding Filipinos). Filipinos, counted as a historically underrepresented minority group at that time, recorded 83% retention.

By 1986, overall retention had risen to 90%. The Asian American 1-year retention rate was 91%, and Filipino retention had risen to 86%. There were differences in retention rates between regularly admitted students and specially admitted students under the Educational Opportunity Program in favor of regular admissions. Among 21,796 first-time regularly admitted freshmen in the fall of

TABLE 10.14 Combined 5-Year Graduation and Retention Rates of University of California, Berkeley, Asian/Pacific Islander and White Freshmen in Fall of 1980-1982 by Ethnic Group, Citizenship Status, and College

	Asian		Filipino	Japanese	Korean	Other		Total
	Chinese	Indian/ Pakistani				Asian	White	
Engineering and Chemistry								
Number of citizens	194	6	47	57	21	8	704	1,207
Graduated (percentage)	80	33	55	79	81	63	66	66
Retained (percentage)	85	33	60	83	86	63	74	73
Number of immigrants	73	8	8	4	23	17	19	178
Graduated (percentage)	70	88	75	75	52	59	68	64
Retained (percentage)	73	88	75	75	52	71	68	68
Letters and Science								
Number of citizens	729	23	209	295	85	37	4,364	6,847
Graduated (percentage)	69	74	44	70	59	43	67	62
Retained (percentage)	76	78	55	76	65	65	73	69
Number of immigrants	229	28	53	12	121	43	83	650
Graduated (percentage)	61	68	38	100	52	44	58	54
Retained (percentage)	66	75	47	100	61	47	71	62

SOURCE: Frank (1988).

1978, 6,376 (29%) had graduated and 4,152 (19%) were continuing as undergraduates at Berkeley 5 years later. The remainder had transferred, stopped out, or dropped out. Among 4,091 specially admitted students, 17% were continuing at Berkeley and 319 (7.8%) had graduated in 5 years. Among 1,396 regularly admitted Asian Americans, 32% had graduated and 26% had remained at Berkeley. There were 246 regularly admitted Filipinos, of whom 24% had graduated and 28% remained at Berkeley. Among 68 specially admitted Filipino students, 12% had graduated and 29% remained at Berkeley. There were 89 regularly admitted Pacific Islanders, of whom 25% had graduated and 19% remained at Berkeley. Among more than 12,000 non-Hispanic White students, 33% had graduated and 18% were continuing at Berkeley. The tracking rate, the sum of graduates and continuing students, was 48% for all regularly admitted students and 25% for specially admitted students. Among regularly admitted students, Asian (58%), Filipino (52%), and White (51%) students recorded higher than average tracking rates. Among specially admitted students, Filipino, Asian, Pacific Islander, and White students recorded higher than average tracking rates.

Because some ethnic groups attended Berkeley in limited numbers, Frank (1988) combined Asian Americans who entered Berkeley as freshmen in the fall during the period 1980-1982 for persistence analysis by ethnic groups, citizenship status, and college affiliation. Table 10.14 displays 5-year graduation and retention rates of White and Asian students by ethnic group. Chinese and Japanese American students recorded graduation/retention rates higher than those of their White peers, whereas other Asian groups recorded rates that were a little lower.

TABLE 10.15 Mean Numbers of Postsecondary Credits Earned by 1972 NLS and Percentages of 1980 HS&B Seniors Who Earned Bachelor's Degrees by 1984, Classified by Ethnicity and Curriculum Areas

	Science/ Mathematics		Social Humanities Science Education Business			All	
	n						
NLS-72 (Seniors: mean credits earned)							
Asian	92	39 (32)	27 (21)	27 (17)	5 (13)	12 (19)	124 (24)
Black	356	24 (22)	27 (16)	34 (19)	12 (19)	9 (17)	130 (21)
Hispanic	80	23 (26)	32 (22)	33 (20)	12 (21)	7 (14)	129 (24)
White	3,815	29 (28)	29 (23)	29 (19)	9 (17)	9 (17)	127 (23)
HS&B-80 (Seniors: percentage with bachelor's by 1984)							
Asian	38	60 (35)	17 (9)	21 (18)	2 (6)	5 (10)	123 (17)
Black	121	30 (27)	19 (10)	29 (17)	4 (11)	14 (18)	121 (24)
Hispanic	95	29 (26)	20 (9)	33 (19)	3 (12)	18 (22)	122 (17)
White	703	29 (28)	21 (14)	28 (17)	7 (16)	13 (18)	124 (18)

SOURCE: Owings (1987).

NOTE: Standard deviations are in parentheses. NLS = National Longitudinal Study; HS&B = High School and Beyond.

Immigrants' graduation and retention rates were 30% lower than those of U.S. citizens among Koreans. Chinese immigrants' rates were 10% below those of citizens. There were no significant differences among other ethnic groups, in part due to small numbers in these groups. Retention referred only to persistence at Berkeley and not to transfers among departments or colleges within Berkeley.

Asian Americans enrolled in higher education institutions at higher than average rates. They were more likely to enroll without financial aid of any type. Once enrolled, API students were more likely to persevere. It is the combined effects of higher proportions of API high school graduates going on to college, their persistence once enrolled, and their propensity for graduate and particularly professional degrees that resulted in the percentage of Asian Americans increasing at each higher level of university enrollment.

UNDERGRADUATE ACHIEVEMENT, DEGREES EARNED, AND MAJOR FIELDS

Academic performance and credits earned toward a degree are two achievement criteria. Owings (1987) reported that nearly a third of all credits earned by 1972 Asian American high school seniors who took part in NLS follow-up surveys, and who had earned their bachelor's degrees by 1984, were in the areas of science and mathematics. Among Asian American high school seniors who participated in HS&B in 1980, nearly one half of all credits earned by those who had attained bachelor's degrees by 1984 were in science and mathematics. Numbers of Asian American seniors in both studies were modest—260 in NLS-72 and 420 in HS&B-80. Attrition over 12 years in NLS and attainment of bachelor's degrees within

4 years of high school graduation by HS&B participants further reduced their numbers, as shown in Table 10.15.

Apart from credits or degrees earned over time, UGPAs are accepted indicators of academic success. There are differences among institutions, and among departments within an institution, in grading practices. Sue and Abe (1988) reported UGPAs of 4,113 Asian American freshmen and a random sample of 1,000 White classmates who were enrolled at eight University of California campuses in the fall of 1984. Mean UGPAs of White and Asian freshmen were 2.75 and 2.74, respectively. There were no significant gender differences among Asian Americans, but the White female mean UGPA of 2.78 was higher than the White male mean of 2.72. Asian Americans whose best language was not English achieved a mean UGPA of 2.79, higher than the mean (2.70) of peers whose best language was English. There were differences among Asian subgroups in mean UGPAs, as shown in the following table:

Group	Undergraduate Grade Point Average
Chinese	2.89
East Indians/Pakistanis	2.86
Other Asians	2.78
Japanese	2.78
Koreans	2.68
Filipinos	2.44

Although good grades are indicators of success in college, degree attainment is the sine qua non of achievement in higher education. Numbers of Asian Americans who have earned associate, bachelor's, master's, doctorates, and professional degrees have kept pace with rising demographic trends.

In the spring of 1987, HS&B participants responded to a follow-up survey that included items about degrees earned since their high school graduation in 1980. The percentages of Asian, White, and total participants who had earned higher education degrees by 1987 are shown in the following table:

Group	Associate	Bachelor's	Graduate/ Professional
Asians	8.7	27.3	1.7
Whites	6.6	20.2	0.9
Total	6.5	18.2	0.7

Among 1980 high school seniors, proportionately more Asian Americans had obtained postsecondary degrees by 1987.

Cross-sectional degree attainment data since 1980 supported longitudinal findings from HS&B. Table 10.16 shows the increase in numbers of degrees awarded to Asian Americans over time. The Asian American share of all degrees awarded

TABLE 10.16 Total Associate, Bachelor's, Master's, Doctorate, and First Professional Degrees Awarded as Well as Numbers and Percentages Awarded to Asian Americans, 1981, 1985, 1989, and 1992

	1981	1985	1989	1992
Associate degrees				
Total	410,174	429,815	432,144	494,387
Asian American	8,650 (2.1)	9,914 (2.3)	12,519 (2.9)	15,596 (3.2)
Bachelor's degrees				
Total	934,811	968,311	1,016,350	1,129,833
Asian American	18,794 (2.0)	25,395 (2.6)	37,674 (3.7)	46,720 (4.1)
Master's degrees				
Total	294,183	280,421	309,770	348,682
Asian American	6,282 (2.1)	7,782 (2.8)	10,335 (3.3)	12,658 (3.6)
First professional degrees				
Total	71,340	71,057	70,856	72,129
Asian American	1,456 (2.0)	1,816 (2.6)	2,976 (100)	4,455 (6.2)
Doctorates				
Total	32,839	32,309	35,659	40,090
Asian American	877 (2.7)	1,106 (3.4)	1,323 (3.7)	1,559 (3.9)

SOURCE: Snyder and Hoffman (1994).
NOTE: Percentages are in parentheses.

mirrored population growth. Bachelor's degrees awarded to Asian American candidates rose from 2% of the 1981 total to 3.8% of the total in 1989. By 1993, Asian Americans accounted for 4.4% of bachelor's degrees and 3.3% of associate degrees earned. Asian Americans represented 2.1% of master's degrees awarded in 1981 and 3.8% of those awarded in 1993. First professional degrees earned by Asian Americans rose from 2% of the total in 1981 to 6.9% of the total by 1993. Asian American doctorates who were U.S. citizens went from 1.9% in 1981 to 2.7% by 1989. Changes in degrees earned by Asian Americans over time varied by types of degree and by gender. Between 1992 and 1993, first professional degrees grew by 15.8%, whereas master's degrees rose by 9.5%. Asian women outpaced men in rate of change. First professional degrees to women rose 23.6%, whereas to men they rose 10.2% (Carter & Wilson, 1992, 1996; Snyder & Hoffman, 1994). The significant gender difference unrelated to demographic changes might have reflected changing attitudes toward higher education for women among Asian American communities. High proportions of advanced degrees awarded to Asians, particularly doctorates in physical sciences, engineering, and quantitative professions, went not just to Asian Americans but also to Asians who held permanent or temporary visas. Many Asian nationals with advanced degrees from U.S. institutions later opted to become naturalized U.S. citizens (Hsia, 1988).

The distribution of Asian American bachelor's degree holders by fields in 1989 showed that relatively more APIs chose to major in engineering, business, social,

or biology/life sciences than in the humanities. Only 1,127 (1.1%) earned bachelor's degrees in education. The cohort was awarded 8,039 bachelor's degrees in business, 1,733 in health professions, and 3,992 in social sciences. Almost 3,000 bachelor's degrees in biology/life sciences and 7,000 in engineering meant that Asian American college graduates represented more than 8% of all degrees awarded in these two fields. Among women engineering graduates in 1989, 1 in 10 was Asian American. In 1993, in descending order, bachelor's degrees were awarded to Asian Americans in the following fields:

<i>Field</i>	<i>Bachelor's</i>
Business	11,780
Engineering	7,307
Social sciences	5,712
Biological/life sciences	5,205
Health professions	2,513
Education	1,100

By 1994, the graduation rate for Asian Americans at National Collegiate Athletic Association Division I institutions was 65%, highest among all groups. The Asian American women's graduation rate, 67%, was higher than the Asian American men's rate of 62% (Carter & Wilson, 1996).

In 1993, Asian Americans were awarded 13,866 master's degrees, an increase of 78% from their numbers in 1985. In descending order, they had concentrated in the following fields:

<i>Field</i>	<i>Master's</i>
Business	4,304
Engineering	2,441
Education	1,391
Health professions	864
Public affairs	466
Social sciences	422

First professional degrees awarded to APIs between 1985 and 1993 had increased by 184%, to 5,160, by 1993. Of all doctoral degrees awarded in 1994, 949 (3.5%) were to Asian American citizens. Almost half of all 1994 doctorates were awarded to non-U.S. citizens. A total of 9,359 doctorates were awarded to Asian nationals. They outnumbered Asian American doctorates by 9 to 1 (Carter & Wilson, 1996). Asian recipients of science and engineering doctorates doubled in the decade between 1983 and 1993. The growth was recorded for both Asian Americans and Asian immigrants with permanent resident visas. Asian American science and engineering doctorates rose from a total of 345 in 1983 to 710 in 1993. Asian permanent visa doctorates rose in the same interval from 433 to 892 (National Science Foundation, 1995).

The college/university graduation rate of Asian Americans has been the highest among all groups. Proportions of API college graduates who continued their higher education and obtained advanced degrees also have been high. These trends, augmented by Asian nationals (particularly those with permanent resident visas who obtained doctorates and continued on to become naturalized American citizens), have resulted in higher than expected numbers of Asian Americans holding advanced academic and professional degrees.

FACULTY AND ADMINISTRATION IN HIGHER EDUCATION

Did the unexpectedly high proportions of Asians and Asian Americans who earned advanced degrees throughout the 1980s and 1990s follow a traditional academic career path by staying on campus as faculty members, research staff, or administrators? Manpower data from annual reports of the National Science Foundation have suggested that, until recent population changes, the tiny fraction of faculty of Asian heritage were not Asian Americans but rather Asian nationals or naturalized U.S. citizens (Hsia, 1988).

Recent statistics on Asian American faculty members, particularly tenured faculty, and on administrators in higher education institutions have shown that numbers have grown as demographics changed but that their tenure rates have been low (Carter & Wilson, 1991). Between 1983 and 1991, Asian American full-time faculty rose from 16,899 (3.5%) to 26,545 (5.1%). Since 1991, their numbers have eroded. In 1993, their number was down to 25,269 (4.7%). The decrease in numbers was observed particularly among Asian males. Female Asian American faculty have continued to grow, doubling between 1983 and 1993, whereas male full-time faculty grew by 38% in the interval. By 1993, Asian Americans represented 4.5% of all full professors, 4.6% of associate professors, 6.1% of assistant professors, 3.4% of instructors and lecturers, and 4.6% of other faculty. In addition, 64% of Asian American faculty held tenure in comparison to 73% of White faculty (Carter & Wilson, 1996).

Between 1980 and 1990, 38% of Asian American recent doctorates with definite postdoctoral career plans were going into academic teaching or research. This figure was markedly lower than the 50%, 55%, 55%, and 57% reported for White, African American, American Indian, and Hispanic American peers, respectively. Science and engineering Asian American doctorates had the option to choose careers in industry. The lower than average Asian American career plans in academe might have been related, in part, to higher proportions of science and engineering doctorates among them. According to Carter and Wilson (1991), Asians on campuses were more likely to be those who obtained doctorates earlier, Asians who were recently naturalized U.S. citizens, or Asians who remained foreign nationals at the time of data collection. Departments in which Asian Americans were most likely to be found as faculty members were those that produced

greater numbers of Asian doctorates as well—engineering, social sciences, physical sciences, mathematics and statistics, business, and biological sciences.

Asian Americans were thin in the ranks of administration and management positions in higher education. As to Asian American chief executive officers (CEOs) of colleges and universities, they were very rare. By 1996, there were altogether only 20 (0.6%) Asian American CEOs heading U.S. institutions, 13 at 4-year institutions. Out of 2,939 CEOs, 2,175 were White. African American, Hispanic, and American Indian CEOs numbered 192, 99, and 28, respectively. The remaining CEOs' ethnicity could not be identified. Numerically and proportionately, Asian Americans were at the bottom of the list. The pool of Asian American administrators and managers, from which CEOs are likely to be drawn, remained small. In 1993, 1.6% of full-time administrators in higher education were Asian American. In 1983, they comprised 1.1% of all full-time administrators. Growth in the decade from 1983 to 1993 did not parallel higher education trends in enrollment, graduate degree attainment, or faculty positions (Carter & Wilson, 1996).

CONCLUSIONS AND POLICY IMPLICATIONS

This review of academic achievement among Asian Americans has shown above average performance in elementary and secondary schools. Statistical data from national longitudinal and cross-sectional studies, as well as regional or single school district research studies of Asian American pupils, supported the conclusion that Asian American pupils at all levels typically record higher than average performance in quantitative subjects. English-proficient APIs also performed well in language-related tasks. There were substantial differences in achievement within the API population. Differences were shown between the native born and immigrants or refugees, not always in favor of the native born. Performance varied among diverse ethnic and language groups, between students fluent in English and those of LEP, and among newcomers of different socioeconomic backgrounds and post-entry experiences. Asian American pupils typically received higher than average grades from their teachers, even when objective test scores show their verbal performance to have been below average.

Diversity notwithstanding, with some exceptions, Asian American academic achievement equaled or exceeded national averages by a variety of objective criteria, at every educational level, from elementary and secondary school through graduate and professional degrees. By the year 2000, Asian Americans are projected to reach 4% of the total U.S. population. Their impact on education could be greater than the numbers imply—first, because APIs enroll in, persist in, and graduate from every level of the educational pipeline; second, because the API population on both coasts and within metropolitan centers has resulted in greater pressure on educational resources in areas of concentration; and finally, because Asian newcomers with limited language ability but well-developed quantitative skills tend to restrict their fields of study to sciences or engineering.

Asian American success in education has, moreover, elicited growing signs of resistance from majority and other minority groups within academe. Institutional response was inevitable. Admissions of Asian Americans to highly selective undergraduate institutions, both private and public, are plateauing after two decades of growth, in line with demographic trends and the deep API talent pool. Admissions testing programs, particularly to medical schools, have been modified to demand greater communicative skills and less science and mathematics knowledge. Reporting of testing data by groups also has changed, with limited quantitative data and greater reliance on graphs. Preliminary data suggest that the distribution of medical students by Asian ethnic groups is changing as a result, with more South Asian matriculants who are strong in English and fewer newcomers, particularly Southeast Asians. The impacts of these institutional policy changes on aspiring Asian American youths have not been widely recognized by institutions or by most Asian communities.

The rapid growth of Asian American students at all levels and their academic achievements have not been accompanied by commensurate growth in Asian American faculty. The number of Asian higher education administrators, particularly CEOs, has remained minute. Despite a broad student base, high academic performance, and high proportions of advanced degree holders, Asian Americans have been unable to gain a foothold in the decision- and policy-making ranks of academic administration.

Policy implications of Asian American academic achievement should begin with recognition of differential validity of assessment instruments to assess Asian Americans' developed abilities and academic achievement. For students of LEP, strong language arts programs with an emphasis on writing remain a continuing need. Because existing measures of developed quantitative abilities underestimated true abilities due to verbally loaded content, interpretation of LEP Asian American mathematical performance ought to take bias into account to avoid underutilization of newcomers' quantitative skills. Scrutiny of selective higher education admissions policies and practices, as well as existing processes for faculty appointments, promotions, and tenure status, must continue so as to monitor academic progress of Asian Americans. There is a pressing need for Asian American communities and higher education decision makers to focus on development and recruitment of Asian American candidates for administrative and management positions in academe. Asian Americans have made progress in overcoming societal exclusion and racial discrimination. As we approach the 21st century, Asian Americans will be less and less likely to be candidates for affirmative action and more and more at risk for future academic limitations in the form of hidden quotas and invisible ceilings.

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