Predictors of Academic Achievement Among Asian American and White Students

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INTRODUCTION

Asian American students have a wide reputation for extraordinary educational achievement. Their success on college campuses around the country has been the subject of media attention in such popular publications as *Newsweek* (April 23, 1984), *Newsweek*: "On Campus" (April 1984), *U.S. News and World Report* (April 2, 1984), the *New Republic* (July 15 and 22, 1985), the *New York Times* (August 3, 1986), and *Asian Week* (August 8, 1986). As these news features highlight, Asian Americans have the highest level of college education of any ethnic or racial group in this country. Among persons over 24 years of age living in California in 1980, for instance, over 31 percent of Asian Americans had completed four or more years of college compared with 21 percent of whites, 11 percent of blacks, 10 percent of American Indians, and 6 percent of Hispanics (U.S. Department of Commerce 1983).

In addition, the enrollment of Asian Americans at the top universities throughout the nation is increasing. Approximately 10 percent of Harvard's freshman class is Asian American. While no more than 13 percent of California high school graduates are eligible for admission to the University of California (UC) system, about 26 percent of Asian Americans qualify (University of California 1985). The educational performance of Asian Americans has generated considerable interest and controversy. On the one hand, their achievements have stimulated interest in the personality, cultural, child-rearing, and other sociopsychological factors that might account for the high achievement levels. On the other hand, the very success of Asian American students has raised concerns over university admissions policies and over the stereotyping of all Asian Americans as high achievers.

The myth that Asian Americans are a "model minority" (Sue and Sue 1972) tends to perpetuate the view that all Asian American students are high achievers with very few needs within the academic realm. Concerns have been expressed over practices that may, in effect, limit the increasing numbers of Asian Americans enrolling in universities. These practices include the use of subjective or nonacademic criteria (for example, the student's interview behavior, high school background of leadership and participation in social activities, and having parents who are university alumni) and the imposition of new entry requirements that are weighted more heavily with verbal than with quantitative skills (Butterfield 1986; Sue and Zane 1985). Asian Americans consistently outscore all other groups, including whites, on tests of quantitative skills, although their verbal scores are typically lower than those of whites (Hsia 1985).

PREDICTORS OF SUCCESS

Research suggests that high school academic performance and scores obtained on college entrance examinations such as the College Board's Scholastic Aptitude Test (SAT) and the American College Testing Program (ACT) are the best predictors of college success (Aleamoni and Oboler 1978; Malloch and Michael 1981; Nisbet, Ruble, and Schurr 1982; Passons 1967; Weitzman 1982). Although high school academic performance is the best single predictor of college academic performance (Dispenzier et al. 1971; McCausland and Stewart 1974; McDonald and Gawkoski 1979), the SAT has been used to supplement the school record and other information about the student in assessing his or her competence for college work (Donlon and Angoff 1971). Fincher (1974), in a 13-year analysis of SAT data in a statewide system, found that use of the SAT increased predictive efficiency 46 percent for males and 43 percent for females over the use of high school grades alone. The College Board Commission on Tests (1970) stated that although the use of SAT scores added appreciably to the accuracy of predicting college grades from high school grade-point average (GPA) or class rank, the College Board's Achievement Tests in specific subject areas added only a modest amount of predictive power to that already obtained by the combination of high school GPA and SAT score (Vol. 1, p. 18).

PREDICTORS OF SUCCESS FOR MINORITY STUDENTS

Predictors of college academic success vary by ethnicity. Thomas and Stanley (1969) suggested that academic aptitude and achievement test scores, rather than high school grades, are often better predictors of college performance for blacks than for whites. Pfeifer and Sedlacek (1971) found that the SAT-verbal (SAT-V) score was a better predictor than was the high school GPA for black males. However, other studies indicate that although SAT scores may improve the prediction of the college GPA for blacks, they may add little to the power already obtained through the high school GPA in predicting college performance for Chicanos, Puerto Ricans, and American Indians (Astin 1982).

In an analysis of SAT-verbal and SAT-mathematical (SAT-M) scores as predictors of freshman college grades for black and white students at 19 institutions, Davis and Temp (1971) suggested that prediction equations derived from a white or a combined population would tend to overpredict college performance for blacks. Other studies also reported that the use of

regression equations derived from white samples would result in an overprediction of grades for black students (Cleary 1968; Kallingal 1971; Pfeifer and Sedlacek 1971; Temp 1971) and for Chicano/Latino students (Goldman and Richards 1974).

In a series of reports from the University of California, predictors of academic achievement were examined for various ethnic groups (Neville, Scott, and Wakim 1982; Song undated; Song and Scott 1980). In a study of freshmen at the University of California, Berkeley, in 1977, Song found no evidence that high school grades and SAT scores resulted in substantial over- or underprediction of university grades for Asian American students. Using the same data base, Song and Scott reported that for Asian Americans the multiple correlation (R) for freshman GPA, using high school grades and SAT-verbal and SAT-mathematical scores, was .42, similar to that for whites (R = .41) but lower than the multiple correlations for blacks (R = .64) and Hispanics (R = .52). In addition, when these three predictors were compared with some nontraditional predictors (for example, high school rank, honors/awards received, extracurricular activities, parental income, and leadership ability), high school grades and SAT scores still emerged as the best correlates to university grades.

Wilcox (1974), in a study of predictors of academic success for undergraduate foreign students from Vietnam and Hong Kong, found the correlation between high school GPA and freshman performance to be about .50 in each sample. SAT-mathematical scores were found to predict freshman grades equally as well. Interestingly enough, although the combination of these two predictors—high school GPA and SAT-M scores—increased the correlation with freshman grades by about .10 more than either predictor alone, neither verbal scores nor English proficiency contributed to the prediction equation.

In another study of foreign students attending college in the United States, Dizney and Roskens (1964) found a sample of foreign students at Kent State University to have a significantly greater aptitude for mathematics than for English on the American College Test (ACT). Furthermore, although combining mathematical and English aptitude scores significantly improved the prediction of college performance for domestic students, the combination did not significantly affect the prediction of college GPA for foreign students.

In a domestic study of Chinese and white students from three liberal arts colleges, Yang (1978) reported that SAT-verbal scores were a better predictor than SAT-mathematical scores for white students, whereas the reverse was true for Chinese students. However, college GPAs predicted from regression equations for Chinese students did not differ from GPAs predicted for white students, even though the regression equations for the two groups were significantly different. In an investigation of academic performance by University of California, Los Angeles (UCLA), freshman students, Neville, Scott, and Wakim (1982) found an R^2 of .26 between high school grades and UCLA freshman grades for Asian Americans. The addition of SAT-V and then SAT-M scores in a stepwise regression equation yielded R^2s of .31 and .32, respectively. The Rs obtained at UCLA were somewhat lower than those for Asian American students at Berkeley. Furthermore, whereas SAT-M scores were a better predictor at Berkeley, SAT-V scores were superior in predicting college performance by UCLA's Asian American students.

Goldman and Hewitt (1976) have also examined multiple correlations between certain predictors (high school GPA and SAT performance) and the criterion (university freshman grades) for various University of California campuses. For the largest campus in their study, UCLA, the multiple correlations were .42 for Asian Americans, .43 for whites, .33 for blacks, and .38 for Hispanics. For the Asian American students, SAT-M scores were far superior to SAT-V scores in predicting university grades. In contrast, the better predictor among whites and blacks was SAT-V scores; both tests had similar predictive value among Hispanics.

Summary

In summary, the results for Asian American students in the University of California system appear to differ from those found for non-Asian American students in other studies. First, most other studies have reported higher R values for college grades when high school grades and SAT scores were used as predictors (Aleamoni and Oboler 1978; Chissom and Lanier 1975; Larson and Scontrino 1976; Slack and Porter 1980). Second, the SAT-V score has been a superior predictor compared with the SAT-M score in most of these studies.

Our study examined various predictors of academic performance for Asian American students who enrolled as freshmen in any of the eight University of California campuses during fall 1984. The campuses are Berkeley, Davis, Irvine, Los Angeles, Riverside, San Diego, Santa Barbara, and Santa Cruz. The purpose of the study was to determine how well certain variables such as high school grades, SAT scores, and College Board Achievement Test scores predicted academic performance during the freshman year at a university and to determine whether the predictors varied according to (1) membership within different Asian American groups (Chinese, Japanese, Korean, Filipino, East Indian/Pakistani, and other Asian groups); (2) major (undeclared, professional schools, physical sciences, life sciences, humanities, engineer-

ing, or social sciences); (3) language spoken (English best or English not best); and (4) gender. This study is unique in that no other validity investigation has examined differences among various Asian American subgroups on these factors, nor has any other study reported on as many Asian American students.

METHOD

Subjects

From a total freshman student population of 22,105 who enrolled in the eight UC campuses in fall 1984, the records of the 4,113 Asian American domestic (nonforeign) students were examined and compared with those of 1,000 randomly selected white students. Students indicated their ethnicity on the application forms used for admissions. Males constituted about 50 percent of the Asian Americans, while 49 percent of the white sample were males. The Asian American student numbers were, in descending order, Chinese 1,470; Filipinos 712; Japanese 643; Koreans 575; Other Asian Americans, or those not members of the specific groups listed in this study, 525; and East Indians/Pakistanis 170. It should be noted that, in the tables, sample sizes for analysis vary because some students were missing data on some variables. Asian American students were also divided into two groups by presumed English proficiency: those for whom English was probably the best language and those for whom English was probably not the best language. From data in a previous study by Ramist and Arbeiter (1986), SAT scores were compared between Asian American students who indicated that English was their best language and those who said it was not. A discrepancy score of at least 170 points between SAT-M and SAT-V scores was found to reliably identify Asian American students for whom English was not the best language. In fact, no overlap on the verbal score was found between the bottom 25 percent of the students for whom English was the best language and the top 25 percent of the students for whom English was not the best language. By using the discrepancy score procedure, we were able to classify most students as to whether their primary language was or was not English.

Variables Examined

The criterion variable was the university freshman grade-point average, which was the average of all grades received by a student during the academic year. Six predictor variables were used for the GPA:

1. High school grade-point average (HSGPA) calculated from courses such as English, history, mathematics, laboratory science, and foreign language
2. Scholastic Aptitude Test-verbal score
3. Scholastic Aptitude Test-mathematical score
4. English Composition Test (ECT) score from the College Board Achievement Test series
5. Level I or Level II Mathematics Test (MI or MII) score from the College Board Achievement Test series

Analysis

With five predictor variables, it was possible to generate a large number of predictor-criterion combinations. A decision was made to conduct regression analyses with two sets of predictors of the freshman GPA. First, HSGPA, SAT-V score, and SAT-M score were used as predictors. This set of variables has been widely employed in making admissions decisions and was of primary importance in this study. Second, Achievement Test results (ECT and MI or MII) were combined with HSGPA to predict the university GPA.

The regression analyses were performed for each Asian American group, all Asian American students combined, and whites. Analyses were also made for all Asian American and white students according to gender and academic majors. (Female East Indian/Pakistanis were not analyzed because the number of students was too small to reach the size criterion for conducting an analysis.) For the academic major analysis, students were first grouped by their declaration or nondeclaration of a major. Students who declared were further categorized according to field: professional schools (not including engineering), physical sciences, life sciences, humanities, engineering, and social sciences.

RESULTS

Means for All Variables

Means (*M*) and standard deviations (*SD*) for each predictor variable and the criterion variable—divided by ethnicity, gender, and English-best/not-best language—are shown in Tables 1, 2, and 3. In view of their large number, not all variables shown in the tables are fully discussed in the text; only the more salient findings are presented below. It should be noted that in the comparisons of means, *t*-tests were performed; if the two compared values were based on widely discrepant variances, t'-tests were used.

High School Grades

Asian American students had superior high school grades (Table 1). The mean HSGPA for Asian Amer-

Table 1. Group Means and Standard Deviations for Each Variable by Gender and Ethnicity

	SAT-V		SAT-M		HSGPA	
	M	*SD*	*M*	*SD*	*M*	*SD*
Males						
All Asian	462.5	117.5	609.6	92.2	3.67	0.39
American	(2,050)		(2,050)		(2,023)	
Chinese	477.5	116.1	632.4	87.0	3.69	0.38
	(742)		(742)		(724)	
Japanese	516.8	89.9	632.0	75.5	3.72	0.39
	(310)		(310)		(303)	
Korean	432.6	118.2	626.5	84.5	3.63	0.37
	(284)		(284)		(280)	
Filipino	459.2	89.7	547.7	86.6	3.55	0.40
	(321)		(321)		(328)	
East Indian/	538.8	97.2	635.5	84.3	3.79	0.37
Pakistani	(96)		(96)		(99)	
Other Asian	373.2	119.1	572.0	92.9	3.70	0.34
American	(289)		(289)		(281)	
White	519.0	89.5	607.0	84.7	3.53	0.42
	(471)		(471)		(456)	
*Females**						
All Asian	449.8	116.7	559.3	97.8	3.71	0.36
American	(2,063)		(2,063)		(2,052)	
Chinese	469.3	119.6	590.9	92.8	3.77	0.35
	(728)		(728)		(722)	
Japanese	505.1	90.1	577.6	86.6	3.77	0.34
	(333)		(333)		(335)	
Korean	403.4	119.7	562.3	90.8	3.65	0.35
	(291)		(291)		(285)	
Filipino	439.0	92.1	496.3	92.9	3.57	0.38
	(391)		(391)		(390)	
Other Asian	373.5	115.8	535.9	90.7	3.73	0.34
American	(236)		(236)		(235)	
White	506.0	87.4	548.0	86.5	3.64	0.38
	(489)		(489)		(489)	
Totals						
All Asian	456.1	117.3	584.4	98.3	3.69	0.37
American	(4,113)		(4,113)		(4,075)	
Chinese	473.4	117.9	611.8	92.3	3.73	0.37
	(1,470)		(1,470)		(1,446)	
Japanese	510.8	90.1	603.8	85.8	3.75	0.36
	(643)		(643)		(638)	
Korean	417.8	119.8	594.0	93.4	3.64	0.36
	(575)		(575)		(565)	
Filipino	448.1	91.5	519.5	93.6	3.56	0.39
	(712)		(712)		(718)	
East Indian/	520.0	101.1	605.8	93.8	3.80	0.37
Pakistani	(170)		(170)		(175)	
Other Asian	373.3	117.5	555.8	93.6	3.72	0.34
American	(525)		(525)		(516)	
White	512.4	88.6	576.9	90.5	3.59	0.41
	(960)		(960)		(945)	

Note: Figures in parentheses are base *N*s for the adjacent means. Because number of subjects was calculated in different ways, combined Asian American subgroups yield slightly different figures than the "All Asian American" (i.e., total) number of subjects.

* Number of East Indian/Pakistani female students was too small for analysis.

icans was 3.69 compared with 3.59 for whites; t^l (987) = 6.88, with a probability (p) of $p < .001$. Females tended to have higher HSGPAs than did males: For Asian Americans it was 3.71 versus 3.67, respectively; t (4,073) = 6.81, $p < .001$. For whites it was 3.64 versus 3.53; t (943) = 8.46, $p < .001$. Within the Asian American group, East Indians/Pakistanis had the highest mean HSGPA (3.80), while Filipinos had the lowest (3.56). With the exception of the Filipinos, all the Asian American subgroups exceeded the average HSGPA of whites. Dividing students by their proficiency in English failed to reveal differences in HSGPA; note that $M = 3.69$ for both groups, as shown in Table 3.

SAT Scores

Consistent with previous studies, Table 1 shows that Asian Americans achieved higher average SAT-mathematical scores than did whites (584 versus 577); t^l (1,043) = 2.27, $p < .01$. They received lower average scores than did whites on the SAT-verbal sections (456 versus 512); t^l (1,117) = 16.59, $p < .001$. The scores for the Asian American students rank favorably with the average scores (SAT-M = 519 and SAT-V = 398) obtained from a national sample of college-bound Asian American seniors (Arbeiter 1984). For both Asian Americans and whites, males had higher SAT-verbal and SAT-mathematical scores than did females. The difference was stronger in SAT-M than in SAT-V scores. Asian American males had an average SAT-M score of 610, while females achieved an average score of 559; t (4,111) = 33.94, $p < .001$. On SAT-V performances, males achieved an average of 462 compared with an average of 450 for females; t (4,113) = 2.96, $p < .01$. The male–female difference for SAT-M scores was also substantial for whites: 607 versus 548; t (958) = 21.35, $p < .001$. White SAT-V scores were 519 versus 506; t (958) = 4.55, $p < .001$. Thus, while females exceeded males in high school grades, their average SAT scores, particularly on the mathematical portion, were lower than those of males. Large differences in SAT performances were found among the Asian American subgroups. East Indians/Pakistanis (M = 520) had the highest SAT-V score, while Other Asian Americans (M = 373) had the lowest score. On the SAT-M section, the Chinese (M = 612) scored the highest, and Filipinos (M = 520) scored the lowest.

Since the English-best/not-best dichotomy (Table 3) was derived from SAT scores, it was not surprising that the mean SAT-V score (500) for Asian American students whose best language was English exceeded that of English-not-best students (370). In the SAT-M section English-best students received a lower average score than did their English-not-best counterparts (563 versus 626); t^l (1,815) = 21.43, $p < .001$.

Table 2. Group Means and Standard Deviations for Each Variable by Gender and Ethnicity

	Univ. GPA		*ECT*		*MI*		*MII*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Males								
All Asian American	2.74 (1,946)	0.69	461.6 (2,003)	99.9	568.6 (1,234)	85.9	669.5 (773)	85.4
Chinese	2.86 (689)	0.68	473.2 (730)	98.9	584.9 (420)	88.5	693.9 (310)	77.7
Japanese	2.68 (295)	0.68	495.7 (307)	96.1	584.5 (193)	78.7	677.3 (114)	75.9
Korean	2.72 (270)	0.69	437.7 (280)	93.7	579.8 (160)	85.5	659.2 (122)	82.8
Filipino	2.47 (321)	0.62	448.9 (308)	86.6	527.2 (233)	77.4	609.3 (75)	91.4
East Indian/Pakistani	2.92 (96)	0.68	534.7 (94)	93.7	—	—	—	—
Other	2.80 (267)	0.68	405.4 (278)	92.0	545.1 (163)	78.2	641.9 (117)	88.2
White	2.72 (441)	0.60	521.9 (454)	92.9	556.3 (331)	79.1	665.7 (124)	72.3
*Females**								
All Asian American	2.73 (1,976)	0.64	470.8 (2,034)	102.9	530.1 (1,563)	86.4	640.1 (472)	84.5
Chinese	2.91 (697)	0.62	489.1 (714)	101.6	560.0 (526)	85.2	661.8 (187)	85.8
Japanese	2.76 (318)	0.61	515.5 (331)	95.4	538.4 (250)	80.2	646.9 (80)	74.6
Korean	2.65 (280)	0.61	433.8 (285)	103.6	527.9 (220)	81.2	628.3 (66)	76.0
Filipino	2.43 (384)	0.60	449.4 (384)	85.5	483.7 (336)	79.2	587.1 (49)	85.7
Other	2.77 (216)	0.63	418.4 (236)	99.4	517.7 (167)	77.7	618.9 (70)	82.2
White	2.78 (461)	0.62	528.8 (480)	90.0	518.2 (404)	80.5	623.9 (75)	82.1
Totals								
All Asian American	2.74 (3,922)	0.66	466.3 (4,037)	101.5	547.0 (2,797)	88.3	658.3 (1,245)	86.2
Chinese	2.89 (1,386)	0.65	481.1 (1,444)	100.5	571.0 (946)	87.5	681.8 (497)	82.3
Japanese	2.73 (613)	0.65	506.0 (638)	96.2	558.5 (443)	82.7	664.7 (194)	76.7
Korean	2.68 (550)	0.65	435.7 (565)	98.7	549.8 (380)	86.8	648.4 (188)	81.6
Filipino	2.44 (705)	0.61	449.2 (692)	85.9	501.5 (569)	81.3	600.6 (124)	89.5
East Indian/Pakistani	2.86 (168)	0.66	529.1 (168)	92.2	—	—	—	—
Other	2.78 (483)	0.66	411.4 (514)	95.6	531.2 (330)	79.0	633.3 (187)	86.5
White	2.75 (902)	0.61	525.4 (934)	91.5	535.3 (735)	82.1	649.9 (199)	78.6

Note: Figures in parentheses are base *N*s for the adjacent means.

Because number of subjects was calculated in different ways, combined Asian American subgroups yield slightly different figures than the "All Asian American" (i.e., total) number of subjects.

* Number of East Indian/Pakistani female students was too small for analysis.

Table 3. Group Means and Standard Deviations for Each Variable by Language

	English best			*English not best*		
Variable	*M*	*SD*	*N*	*M*	*SD*	*N*
SAT-V	500.30	101.80	2,718	370.0	95.60	1,395
SAT-M	563.20	98.80	2,718	625.80	83.00	1,395
HSGPA	3.69	0.39	2,642	3.69	0.34	1,358
GPA*	2.70	0.67	2,543	2.79	0.64	1,294
ECT	491.60	99.10		417.10	87.10	
MI	533.00	87.70		580.10	80.70	
MII	651.80	88.60		666.60	82.70	

* University freshman-year grade point average.

University Grades

Overall, the university grade-point averages for Asian American and white students were very similar: M = 2.74 and M = 2.75, respectively (Table 2). While Asian American males and females were highly similar in GPA, white females (M = 2.78) tended to achieve higher grades than white males did (M = 2.72); t (900) = 2.95, $p < .01$. Within the Asian American student group, considerable ethnic differences in university GPA were found. In descending order, the mean GPAs were Chinese 2.89, East Indians/Pakistanis 2.86, Other Asians 2.78, Japanese 2.73, Koreans 2.68, and Filipinos 2.44. Asian American students for whom English was not the best language (M = 2.79) performed better than did those for whom English was the best language (M = 2.70); t' (1,567) = 4.05, $p < .001$.

College Board Achievement Test Scores

Analysis was made of students who had taken the English Composition Test and either the Mathematics I or II Achievement Tests (Table 2). The comparisons of Asian American and white students yielded results that were highly consistent with those from the analysis of the SAT performances in Table 1. Whites outperformed Asian Americans on the ECT (525 versus 466); t' (1,535) = 17.42, $p < .001$. Asian American students tended to achieve higher scores on the mathematics tests: The scores were 547 versus 535 for MI; t' (808) = 3.41, $p < .01$. The scores were 658 versus 650 for MII; t' (208) = 1.38, p not significant. The average scores of males exceeded those of females: For Mathematics I white males = 556 and white females = 518; t (733) = 12.93, $p < .001$. Asian American males = 569 and females = 530 for MI; t (2,795) = 23.62, $p < .001$. For Mathematics II white males = 666 and females = 624; t' (85) = 3.64, $p < .01$. For MII Asian American males = 670 and females = 640; t (1,243) = 12.20, $p < .001$. Unlike the SAT results, however, white (M = 529) and Asian American (M = 471) females had higher scores on the ECT than did their male counterparts. For white males M = 522; t (932) = 2.31, $p < .05$. For Asian American males M = 462; t (4,035) = 5.76, $p < .001$.

Academic Majors

Fifty-two percent of the Asian American and white students did not declare a major. The fields and percentages of Asian Americans and whites (percentages are shown, respectively, in parentheses) declaring a major were as follows: professional schools (2 percent and 3 percent), physical sciences (6 percent and 5 percent), life sciences (18 percent and 15 percent), humanities (3 percent and 6 percent) engineering (14 percent and 8 percent), and social sciences (5 percent and 11 percent). In general, Asian American students were more likely than white students to major in engineering and less likely to major in the humanities and the social sciences.

High School Grades and SAT Scores as Predictors of University Grades

Overall Comparisons

The zero-order correlations between the predictor variables (HSGPA, SAT-V score, and SAT-M score) and the criterion (university first-year GPA) indicated that for Asian American students the HSGPA was the strongest correlate: r = .455, where r is a correlation. The SAT-V score and the SAT-M score were correlated, respectively, .235 and .370 with the GPA. Although the HSGPA achieved the highest correlation with the university GPA for whites (r = .413), the correlation of SAT-V score and GPA exceeded that of SAT-M score and GPA (.272 to .194). Since the predictor variables were intercorrelated, it was necessary to examine the multiple correlations (R) between the predictors and the criterion and to note the unique contributions of each predictor to the criterion. Tables 4 and 5 show the multiple correlations between the predictor variables (HSGPA, SAT-V, and SAT-M) and the criterion (university GPA). For all Asian American students the three predictor variables yielded a multiple correlation of .498, which exceeded the multiple correlation of .451 for white students (Table 4). An examination of the beta weights (expressed as proportional contributions of the predictors to the criterion) for the predictor variables revealed interesting ethnic differences that were consistent with the findings on the zero-order correlations. Whereas HSGPA made the largest contribution in the prediction of university grades for both Asian American and white students, considerable differences were found in the contributions made by SAT performances. For Asian Americans the SAT-M score contributed 36 percent and the SAT-V score contributed only 3 percent to the prediction of university grades. For whites the situa-

Table 4. Proportional Contributions of SAT-V Score, SAT-M Score, and HSGPA to Regression Equation by Gender and Ethnicity

	N	*R*	*SE*	*SAT-V*	*SAT-M*	*HSGPA*
Males						
All Asian American	1,842	.498	.59	.01	.38	.61
Chinese	649	.572	.55	.03	.32	.65
Japanese	281	.405	.61	.08	.30	.62
Korean	257	.423	.63	.02	.31	.67
Filipino	308	.389	.58	.32	.09	.59
East Indian/ Pakistani	89	.489	.59	.23	.14	.63
Other Asian American	250	.517	.59	.02	.57	.41
White	411	.443	.53	.27	.05	.68
*Females**						
All Asian American	1,888	.501	.55	.06	.35	.59
Chinese	667	.492	.54	.04	.41	.55
Japanese	304	.492	.53	.14	.20	.66
Korean	262	.396	.55	.11	.06	.83
Filipino	372	.393	.55	.27	.12	.61
Other Asian American	205	.518	.54	.03	.43	.54
White	437	.465	.55	.33	.13	.54
Totals						
All Asian American	3,730	.498	.57	.03	.36	.61
Chinese	1,316	.532	.54	.00	.35	.65
Japanese	585	.442	.57	.13	.20	.67
Korean	519	.408	.59	.03	.27	.70
Filipino	680	.391	.56	.29	.11	.60
East Indian/ Pakistani	159	.545	.56	.29	.11	.60
Other Asian American	455	.515	.57	.01	.54	.45
White	848	.451	.54	.32	.03	.65

Note: Because number of subjects was calculated in different ways, combined Asian American subgroups yield slightly different figures than the "All Asian American" (i.e., total) number of subjects.

* Number of East Indian/Pakistani female students was too small for analysis.

tion was reversed; SAT-M and SAT-V scores contributed, respectively, 3 percent and 32 percent.

Gender and English Proficiency

Dividing the students by ethnicity and gender did not alter the findings presented above. Regardless of gender and ethnicity, HSGPA made the largest contribution to the regression equation. For Asian American males and females, the SAT-M score was a stronger predictor than the SAT-V score, while the opposite was true for white males and females (Table 4). Interestingly, the SAT-M score was superior to the SAT-V score for Asian American students whose best or not-best language was English; however, where English was the best language, the superiority was slight (Table 5).

Asian American Subgroup Differences

Some marked differences emerged when the various Asian American groups were compared. The multiple correlations for the groups ranged from a high of .545 for East Indians/Pakistanis to a low of .391 for Filipinos (Table 4). Thus, high school grades and SAT scores showed only a modest ability to predict the university grades of Filipinos. Furthermore, in contrast to all other groups where the HSGPA made the strongest contribution in the prediction of university grades, the SAT-M score was the strongest predictor for Other Asian Americans. Filipinos and East Indians/Pakistanis were also unlike the other Asian American groups in that SAT-V scores contributed more to the regression equation than did SAT-M scores. These findings reveal a great variability among Asian American subgroups.

Academic Majors

Table 5 shows the multiple correlations and proportions of contributions for Asian American and white

Table 5. Proportional Contributions of SAT-V Score, SAT-M Score, and HSGPA to Regression Equation by Major, Ethnicity, and Language

	N	*R*	*SE*	*SAT-V*	*SAT-M*	*HSGPA*
Undeclared						
Asian American	1,958	.492	.57	.07	.34	.60
White	440	.451	.56	.39	.04	.57
*Professional schools**						
Asian American	63	.563	.55	.00	.35	.64
*Physical sciences**						
Asian American	222	.491	.57	.09	.30	.61
Life sciences						
Asian American	690	.560	.57	.01	.36	.62
White	130	.561	.48	.34	.03	.63
*Humanities**						
Asian American	94	.516	.51	.03	.37	.60
Engineering						
Asian American	526	.435	.56	.16	.44	.40
White	69	.563	.51	.01	.04	.95
Social sciences						
Asian American	177	.488	.55	.20	.21	.59
White	96	.534	.50	.12	.21	.67
English best	2,472	.505	.57	.17	.22	.61
English not best	1,258	.490	.56	.11	.38	.50

* Number of white students in sample was too small for analysis.

students according to academic major categories—undeclared, professional schools, physical sciences, life sciences, humanities, engineering, and social sciences. (Since the white sample was composed of 1,000 students, dividing them according to declared majors produced insufficient numbers for data analysis in the professional schools, physical sciences, and humanities.) The HSGPA made the largest contribution to the regression equations except for Asian Americans in engineering. Very striking was the superiority of SAT-M over SAT-V scores as a predictor for Asian Americans in all majors except the social sciences, where the proportion of contribution for SAT-M (.21) was similar to that for SAT-V (.20). For whites the pattern was mixed, and SAT-M scores made a larger contribution to the regression equation than did SAT-V scores in the social sciences; SAT-V was superior for undeclared students and for those majoring in the life sciences. The SAT scores were not a major predictor in the regression equation for white students majoring in engineering, since HSGPA accounted for 95 percent of the contribution. The findings suggest that SAT-M scores are an important predictor of university grades for Asian American students, regardless of their academic majors.

High School Grades and Achievement Test Scores as Predictors of University Grades

Overall Comparisons

When high school grades and College Board Achievement Test scores (English Composition Test and Mathematics I and II) were used as predictors (zero-order correlates) of university freshman grades, the results were consistent with those found for high school grades and SAT scores. For Asian American and white students, the best single predictor of the university GPA was the high school GPA. However, the next strongest correlate for Asian Americans was the mathematics score (.348 for MI and .436 for MII); ECT yielded a correlation of .291. For whites mathematics scores were correlated .195 for MI and .164 for MII, while ECT was correlated .286 with the GPA. As indicated in Table 6, the multiple correlation using HSGPA, ECT, and MI was .474 for all Asian Americans, which exceeded the .446 multiple correlation for all whites. For Asian Americans and whites, HSGPA made the largest contribution to the regression equation, accounting for 55 percent and 62 percent, respectively. Among the Asian Americans, MI and ECT accounted for, respectively, 33 percent and 12 percent of the predictive weight. For whites the figures were 31 percent for ECT and 7 percent for MI. Similar findings were obtained when MII rather than MI was used as a predictor (Table 7). The proportions of contribution for the predictors were 52 percent HSGPA, 1 percent ECT, and 47 percent MII for Asian Americans and 69 percent HSGPA, 26 percent ECT, and 5 percent MII for whites. The multiple correlation was higher for Asian Americans than for whites (.542 versus .461). Therefore, the results, when high school grades and Achievement Test scores are used, provide convergent support for the findings when the SAT is used—namely, mathematical skills are better predictors of academic performance than are verbal skills for Asian American but not for white students.

Table 6. Proportional Contributions of HSGPA, ECT, and MI to Regression Equation by Gender and Ethnicity

	N	*R*	*SE*	*HSGPA*	*ECT*	*MI*
Males						
All Asian American	1,091	.464	.58	.50	.06	.44
Chinese	358	.557	.56	.58	.03	.40
Japanese	173	.431	.54	.42	.13	.45
Korean	144	.428	.60	.19	.03	.48
Filipino	223	.345	.58	.49	.45	.06
Other Asian American	135	.480	.56	.31	.22	.47
White	294	.427	.52	.71	.26	.03
Females						
All Asian American	1,419	.487	.55	.59	.15	.26
Chinese	476	.443	.55	.60	.16	.23
Japanese	228	.544	.50	.50	.29	.20
Korean	197	.401	.54	.90	.04	.06
Filipino	318	.391	.54	.54	.38	.09
Other Asian American	141	.500	.58	.60	.03	.37
White	357	.462	.55	.56	.36	.09
Totals						
All Asian American	2,510	.474	.57	.55	.12	.33
Chinese	834	.498	.56	.62	.08	.30
Japanese	401	.487	.53	.48	.28	.23
Korean	341	.401	.57	.62	.04	.34
Filipino	541	.371	.56	.51	.41	.08
East Indian/Pakistani	105	.520	.56	.73	.00	.26
Other Asian American	276	.481	.57	.42	.11	.47
White	651	.446	.54	.62	.31	.07

Note: Because number of subjects was calculated in different ways, combined Asian American subgroups yield slightly different figures than the "All Asian American" (i.e., total) number of subjects.

Gender and English Proficiency

Using HSGPA, ECT, and MI as predictors, the multiple correlations were .464 for Asian American males, .487 for Asian American females, .427 for white males, and .462 for white females (Table 6). Thus, when these variables were used, university grades were predicted more accurately for Asian Americans than for whites, and more accurately for females than for males. For Asian Americans as an aggregate, HSGPA made the

largest contribution to the regression equation. Moreover, regardless of gender, MI was a stronger predictor than was ECT for Asian Americans, while the reverse was true for whites. Similar findings emerged when MII rather than MI was used (Table 7). The only striking difference was in the multiple correlations. For all ethnicity-by-gender groups except Japanese and white females, the regression equations involving MII yielded higher multiple correlations than those involving MI. Although MII was a better predictor than MI for white females, the multiple correlation using MII was lower than for MI because HSGPA for white females with an MII score was a relatively poor predictor; it was the lowest contributor among the three predictor variables.

As depicted in Tables 8 and 9, those Asian American students for whom English was the best language showed patterns similar to those for whom English was not the best language: (1) the multiple correlations involving MII were higher than those involving MI; (2) HSGPA was the single largest contributor to the regression equation except for the equation involving MII for English-best students, where HSGPA and MII were similar; and (3) ECT was the weakest contributor in the prediction of university grades.

Table 7. Proportional Contributions of HSGPA, ECT, and MII to Regression Equation by Gender and Ethnicity

	N	*R*	*SE*	*HSGPA*	*ECT*	*MII*
Males						
All Asian American	708	.534	.57	.54	.05	.41
Chinese	282	.574	.50	.55	.07	.38
Japanese	105	.468	.64	.44	.12	.44
Korean	109	.500	.64	.58	.12	.30
Other Asian American	105	.570	.60	.43	.07	.50
White	102	.494	.57	.78	.18	.04
Females						
All Asian American	445	.565	.51	.41	.05	.54
Chinese	177	.637	.47	.38	.05	.57
Japanese	76	.489	.56	.59	.05	.35
White	70	.432	.53	.28	.37	.35
Totals						
All Asian American	1,153	.542	.55	.52	.01	.47
Chinese	459	.591	.49	.52	.02	.45
Japanese	181	.474	.61	.49	.10	.41
Korean	170	.445	.61	.56	.11	.33
Filipino	120	.422	.51	.65	.09	.26
Other Asian American	169	.574	.55	.43	.06	.51
White	172	.461	.56	.69	.26	.05

Note: Number of East Indian/Pakistani students was too small for MII computation.

Because number of subjects was calculated in different ways, combined Asian American subgroups yield slightly different figures than the "All Asian American" (i.e., total) number of subjects.

Table 8. Proportional Contributions of HSGPA, ECT, and MI to Regression Equation by Language and Ethnicity

	N	*R*	*SE*	*HSGPA*	*ECT*	*MI*
English best						
Chinese	578	.514	.57	.68	.14	.19
Japanese	333	.487	.53	.48	.21	.30
Korean	175	.357	.53	.70	.07	.23
Filipino	465	.391	.55	.57	.39	.04
East Indian/Pakistani	84	.570	.55	.71	.04	.24
Other Asian American	128	.512	.60	.29	.37	.34
Total Asian American	1,772	.490	.56	.57	.20	.23
White	573	.451	.54	.61	.37	.01
English not best						
Chinese	253	.467	.54	.51	.11	.38
Korean	166	.459	.61	.52	.05	.43
Other Asian American	146	.459	.54	.49	.03	.48
Total Asian American	725	.437	.58	.53	.01	.46
White	74	.499	.51	.71	.03	.27

Note: Because of small sample sizes, some Asian American groups are not listed but are included in the total Asian American group.

Asian American Subgroup Differences

The results for the regression equations when the SAT was used revealed that the multiple correlation was highest for East Indians/Pakistanis and lowest for Filipinos (Table 4). Similar results were obtained when Achievement Test scores rather than SAT scores were used as a predictor. In general, HSGPA and Achievement Test scores provided the highest multiple correlation for East Indians/Pakistanis and the lowest for Filipinos. (Because of insufficient numbers of East Indians/Pakistanis in the equations involving MII, a multiple correlation was computed only for MI.) For all Asian American groups except Other Asians, the HSGPA accounted for the largest proportions of predictive weight in the regression equation (Table 6). With the exception of Filipinos and Japanese on the MI equations, all Asian American groups had mathematics scores rather than English Composition Test scores as the next-largest contributor to the variance for university grades.

Academic Majors

When those students who completed the Achievement Tests were divided according to declared academic majors, as shown in Tables 10 and 11, the sample sizes in many cases were so small that meaningful analysis could not be performed, especially for whites. If there was an insufficient sample size, the group was not entered in these tables. In general, HSGPA was the largest contributor to the equation except for Asian Americans in engineering, where mathematics Achievement Test scores were superior. For Asian

Table 9. Proportional Contributions of HSGPA, ECT, and MII to Regression Equation by Language and Ethnicity

	N	*R*	*SE*	*HSGPA*	*ECT*	*MII*
English best						
Chinese	245	.575	.52	.49	.08	.44
Japanese	134	.485	.62	.46	.06	.48
Filipino	95	.384	.52	.54	.15	.31
Total Asian American	642	.521	.58	.47	.03	.50
White	143	.475	.57	.67	.22	.11
English not best						
Chinese	214	.617	.46	.51	.08	.41
Korean	96	.541	.57	.89	.01	.10
Other Asian American	113	.635	.49	.33	.23	.44
Total Asian American	506	.575	.51	.57	.02	.41

Note: Because of small sample sizes, some Asian American groups are not listed but are included in the total Asian American group.

Table 10. Proportional Contributions of HSGPA, ECT, and MI to Regression Equation by Ethnicity and Major

	N	*R*	*SE*	*HSGPA*	*ECT*	*MI*
Undeclared						
Asian American	1,364	.482	.56	.53	.15	.31
White	332	.468	.56	.58	.31	.11
Physical sciences						
Asian American	133	.524	.53	.60	.00	.40
Life sciences						
Asian American	508	.549	.57	.57	.06	.37
White	110	.531	.50	.66	.32	.03
Humanities						
Asian American	215	.497	.53	.49	.11	.40
Engineering						
Asian American	215	.296	.54	.34	.24	.41
Social sciences						
Asian American	157	.506	.55	.49	.23	.28
White	90	.462	.52	.66	.14	.20

Americans mathematics was a stronger contributor than was the English Composition Test across all majors. There were simply not enough whites in the different majors to permit overall conclusions.

Prediction Bias

Another way of comparing ethnic differences in predictors of academic achievement is to note the prediction bias that occurs when the regression equation derived from one group is applied to the other. In other words, is the regression equation generated by whites accurate in predicting the performances of Asian American students? To conduct the analysis, we used the white regression equation, which predicted the criterion (university freshman grades) with the lowest average squared error possible. By entering into this equation the scores received by Asian American students on the predictor variables, we could compare the grades predicted by the white regression equation with those that were actually received by Asian American students. Tables 12 and 13 show the differences between the predicted and the actual grades obtained when the prediction is based on the white regression equation for HSGPA, SAT-M score, and SAT-V score. Asian Americans received actual grades that were .02 higher than the predicted grades. Thus, there is no evidence that the use of the regression equation placed Asian Americans, as an aggregate group, at a major disadvantage.

Some substantial differences occurred, however, when the prediction bias was examined for specific groups. The white regression equation severely underpredicted the performances of Chinese and Other Asian American students. The Chinese received an average grade that was 0.12 higher, while Other Asians performed 0.15 higher than predicted by the white regression equation. Serious overprediction occurred for Filipinos and the Japanese, who achieved average grades 0.19 and 0.09, respectively, lower than predicted. This means that the white regression equation was biased in either direction, depending on the particular Asian American group. The white regression equation also severely underpredicted the performance of Asian American students for whom English was not the best language (Table 13). The university grades of these students averaged 2.79 when they were predicted to have an average of 2.62. On the other

Table 11. Proportional Contributions of HSGPA, ECT, and MII to Regression Equation by Ethnicity and Major

	N	*R*	*SE*	*HSGPA*	*ECT*	*MII*
Undeclared						
Asian American	552	.535	.55	.50	.01	.49
White	91	.358	.56	.44	.24	.31
Physical sciences						
Asian American	84	.525	.57	.56	.13	.31
Life sciences						
Asian American	175	.611	.52	.56	.04	.40
Engineering						
Asian American	303	.493	.55	.40	.10	.50

Table 12. Prediction of University Freshman GPA Using White Students' Regression Equations with SAT-V Score, SAT-M Score, and HSGPA

	Predicted	*Actual*	*Difference*
Males			
All Asian American	2.71	2.74	−.03
Chinese	2.73	2.86	−.13
Japanese	2.79	2.68	+.11
Korean	2.66	2.72	−.06
Filipino	2.65	2.47	+.18
East Indian/Pakistani	2.85	2.92	−.07
Other Asian American	2.65	2.80	−.15
Females			
All Asian American	2.73	2.73	0
Chinese	2.81	2.91	−.10
Japanese	2.85	2.76	+.09
Korean	2.63	2.65	−.02
Filipino	2.60	2.43	+.17
Other Asian American	2.61	2.77	−.16
Totals			
All Asian American	2.72	2.74	−.02
Chinese	2.77	2.89	−.12
Japanese	2.82	2.73	+.09
Korean	2.64	2.68	−.04
Filipino	2.63	2.44	+.19
East Indian/Pakistani	2.86	2.86	0
Other Asian American	2.63	2.78	−.15

White prediction equations:

Males

Cumulative GPA
= .00999(SAT-V) − .00198(SAT-M) + .56970(HSGPA) + .28012

Females

Cumulative GPA
= .014470(SAT-V) + .00577(SAT-M) + .53185(HSGPA) − .21987

Totals

Cumulative GPA
= .01237(SAT-V) + .00116(SAT-M) + .55925(HSGPA) + .02262

hand, Asian American students for whom English was the best language were overpredicted by 0.07. The only other striking finding was the underprediction of Asian American students majoring in the humanities. The white regression equation predicted an average grade of 2.65, and these students actually received a GPA of 2.86.

Although the detailed analysis is not presented in this report, the same patterns were found when HSGPA and Achievement Test scores were used as predictors in the white regression equation.

DISCUSSION

The purpose of the study was to examine the validity of predictors of freshman-year university grades for Asian American and white students and to determine the effects of gender, Asian American subgroup, and academic majors on predictive validity. The following points summarize the major findings: (1) High school grades and SAT or Achievement Test scores can, to a moderate degree, predict university freshman grades of Asian American and white students. (2) For both Asian American and white students, the best single predictor is the high school grade-point average. (3) For Asian American but not for white students, mathematics scores or quantitative skills are a better predictor of university grades than are verbal scores; this ethnic difference persisted even across academic majors declared by students and even for students whose best language was or was not English. (4) No major sex differences emerged to contradict the overall ethnic differences that were found, except that in the regression equation involving the Level II Mathematics Achievement Test, the contribution of the HSGPA was low for white females. (5) The various Asian American groups showed some differences in the regression equations used to predict the university GPA—especially Filipinos, for whom the predictors yielded the lowest multiple correlation among all the subgroups and for whom verbal skills were superior to mathematical skills in predicting first-year university grades. (6) The white regression equation underpredicted the performances of Chinese, Other Asians, and Asian Americans for whom English was not the best language and overpredicted those of Filipinos, Japanese, and Asian Americans for whom English was the best language.

The findings suggest that high school grades and performance tests have value in predicting future academic performance. Unless better predictors are found, it seems wise to continue their use in estimating academic achievement. The findings also suggest that for Asian American students any changes in admis-

Table 13. Prediction of Asian American Students' University Freshman GPA Using White Students' Regression Equations with SAT-V Score, SAT-M Score, and HSGPA

	Predicted	*Actual*	*Difference*
English best	2.77	2.70	+.07
English not best	2.62	2.79	−.17
Undeclared	2.72	2.74	−.02
Professional schools	2.63	2.68	−.05
Physical sciences	2.60	2.65	−.05
Life sciences	2.66	2.68	−.02
Humanities	2.65	2.86	−.21
Engineering	2.89	2.89	0
Social sciences	2.59	2.58	+.01

sions criteria that would weigh verbal test scores more heavily are likely to reduce the validity of the prediction equation for those students. Given that most studies have found verbal predictors to be stronger than mathematical predictors for students in general, such changes may have an adverse impact on Asian American students but not on students in general.

The analysis of prediction bias indicated that if the white regression equation is applied to Asian American students, little bias is revealed. However, the findings suggest that applying the equation to Asian American students as an aggregate group masks serious bias toward specific student groups: serious underprediction for Chinese, Other Asian Americans, and Asian Americans for whom English is not the best language; serious overprediction for Japanese, Filipinos, and Asian Americans for whom English is the best language. Since Chinese and Other Asian Americans are more heavily represented than are Japanese and Filipinos among Asian American students for whom English is not the best language, prediction bias for particular subgroups may be influenced by English proficiency.

The strength of this study is the inclusion of a large Asian American student population broken down by particular ethnicity. However, there are some important limitations to consider. First, it was not possible to examine other important variables, such as the socioeconomic class of the students, which may substantially influence the validity of predictors. Second, the sole criterion of overall achievement was first-year university grades. One could argue that other criteria should be used, such as grades in certain courses, grades for more than just the freshman year, or nonacademic indices of achievement. Third, many students were unable to declare their majors or may change majors over time; in retrospect, the sample of 1,000 randomly selected white students was not large enough to permit specific Asian American–white comparisons for some majors. Fourth, the population of Asian American students was highly selective. As noted earlier, the Asian American students enrolled in the University of California system achieved higher SAT scores than did college-bound Asian Americans in the rest of the nation. Furthermore, a student who had low SAT-verbal *and* SAT-mathematical scores was unlikely to be admitted to a UC campus. Thus, a student who had a low SAT score on one subtest must have achieved a high score on the other subtest in order to be admitted. This UC admissions procedure is likely to reduce the correlation between SAT-V and SAT-M scores and to restrict the range of scores of enrolled students. These limitations point to the need for further research in order for us to understand the theoretical and policy-related issues involved in the academic achievement of Asian American students.

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