The Relative Contribution of High School Origins to College Access

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The research reported here examines factors associated with college enrollment and success for entering freshman students. This research builds on two traditions in educational attainment research: the role of high-poverty, high-minority concentrations in schools in shaping postsecondary opportunities for high-need, college eligible students and the perpetuation hypothesis (Braddock, 1980), which argues that the racial composition of the high school has important implications for postsecondary choices, especially for students who choose traditionally white colleges and universities. These analyses follow the work in status attainment research that examines school factors—size, control, and other contextual factors—that shape student outcomes (Coleman et al, 1966; Sewell, Hauser and Featherman, 1976; Trent, Henderson and Braddock, 1985).

The objectives of this research are twofold. First, we describe the social and demographic attributes of the high schools of origin of the 2001 freshman cohort of applicants to the Gates Millennium Scholars program, for each racial and ethnic group. Second, we examine the relative contribution of individual versus school factors in shaping key educational outcomes—educational expectations, educational performance, and college selectivity.

The first objective will be especially useful in identifying the extent to which GMS recipients and non-recipients, both of whom are high-need and academically high-performing students, have the same or different high school origins. There is a very important and persistent policy issue here regarding economic segregation in our high schools: *To what extent do high-need students and more affluent students attend the same high schools* (Chaplin, 2002; Rusk, 2002). In addition to identifying high school origins, we provide the distribution of GMS applicants across the colleges in which they initially enrolled. The three postsecondary indicators we report are the level—two-year vs. four-year—of the institution, its minority serving status, and its selectivity.

Meeting the second objective will add to our understanding of the relative contribution of high school attributes to college enrollment, compared with the individual attributes of students that research clearly indicates are important for college enrollment. With these data, we are able to examine the role of selected background factors, academic self-esteem, educational expectations, and locus of control. These analyses are designed to clarify the relative role of the high school and individual factors in shaping college access.

METHOD

Data

The data for this study are from the GMS 2001 freshman applicants who responded to the survey conducted by the National Opinion Research Center (NORC) in 2002. These include both recipients and non-recipients of GMS awards. Non-recipients were proportionately sampled and the sample weights are used in these analyses. Selected variables from the GMS-NORC dataset are used for the analyses, including: demographic data; socioeconomic background variables; attitude and opinion variables; school performance measures, and self-reported postsecondary enrollment. For high school attributes, the GMS-NORC data were merged with high school attribute variables from the U.S. Office for Civil Rights Year 2000 Elementary and Secondary dataset and with additional high school enrollment data from the Common Core dataset. The GMS-NORC data also included variables selected from the applicant files for the 2001 cohort. The merged data file resulted in data for 1609 applicants in the 2001 freshman cohort, of whom 831 are GMS recipients and 778 are non-recipients. The cohort is more than two-thirds female—1105 (68.7%) versus 504 (31.3%) male. African Americans (576, or 35.8%) and Hispanic Americans (509, or 31.6%) make up just over two-thirds (67.4%) of the respondents, while Native

Americans/Alaska Natives (200, or 12.4 %) comprise the smallest number and Asian Pacific Islander Americans (324, or 20.1%) the second smallest.

DESCRIPTIVE RESULTS

We begin with an examination of the attributes of the high schools of origin for the GMS recipients and non-recipients. Our attention is focused on those indicators of school quality and school climate that are widely recognized as factors that influence the opportunity to learn and student performance. From the OCR E&S Survey we use: ***number of AP courses*** offered by the school; ***participation in gifted programs***; ***participation in special education programs***; number of ***suspensions***; and number of ***expulsions*** (these are reported by race and ethnicity; we use them to calculate indices of representation); ***school racial composition***. ***Total enrollment*** and ***control*** (public vs. private) of the high schools of origin are taken from the Common Core data. Our discussion begins with the control and size of the high schools attended by GMS applicants, followed by a discussion of one quality indicator—AP courses offered for each high school attended by GMS applicants. Following the discussion of these high school attributes, we present our findings on the participation rates for different race and ethnic groups in gifted education, special education, and suspension in the high schools of origin for GMS applicants.

High School Attributes

Applicants in the 2001 cohort represent 1308 unique high schools, 1163 of which were public. (See Table 1.) Just 109 high schools had more than one applicant. Only one high school had as many as seven applicants who became GMS recipients and only one high school had as many as six applicants who were non-recipients.

Table 1. Unique High Schools Represented in the GMS 2001 Freshmen Cohort Data

High Schools that had…	All High Schools	U.S. Public or DOD Schools	Private, Foreign, or Home Schools
Only Recipients	613	538	75
Only Non-recipients	586	521	65
Both Recipients & Non-recipients	109	104	5
Total	1,308	1,163	145

Two recipients and three non-recipients (out of 1,609) were missing high school information.
The most recipients from a single high school are seven; the most non-recipients are six.

School Size

Table 2 shows the size of high schools attended by GMS applicants, separately for recipients and non-recipients. Both recipients and non-recipients come mainly from high schools in the largest quartile of high school size, with total enrollments in excess of 1123 students. Because the composition of the 2001 incoming cohort is two-thirds African American and Hispanic, this representation of large high schools seems appropriate. It is also consistent with the documented concentration of low-income, PELL-eligible students in large, primarily urban high schools.

Table 2. Size of Public High Schools in the GMS 2001 Freshmen Cohort Data and All U.S. Public High Schools

	All U.S. Public High Schools SY 2000-2001		Public High Schools in 2001 Freshman Data		Public High Schools that had a GMS recipient		Public High Schools that had only non-recipients	
High School Size	N	%	N	%	N	%	N	%
Quartile 1 Less than 187	4,386	25.0	35	3.0	23	3.6	12	2.3
Quartile 2 187 to 515	4,392	25.0	109	9.4	67	10.5	42	8.1
Quartile 3 516 to 1,123	4,378	25.0	247	21.3	133	20.7	114	22.0
Quartile 4 Over 1,123	4,382	25.0	769	66.3	418	65.2	351	67.6
Total	17,538	100.0	1,160	100.0	641	100.0	519	100.0

Data on all U.S. public high schools comes from the U.S. Department of Education's Common Core Dataset.
Three public high schools in the GMS data had missing size information in the Common Core data.

Our examination revealed no significant differences between recipients and non-recipients in the size of high schools they attended. There is, however, a significant difference in school size among racial groups. On average, Native Americans attended smaller high schools than the other three groups. Asian Pacific Islander American students attended the largest high schools among the four groups. The mean school size for the four groups are: African American: 1409, Native American/Alaska Native: 891, Asian Pacific Islander American: 1906, Hispanic American: 1802.

Number of AP Courses

Shaping the underlying structure of the 1965 Equality of Educational Opportunity Survey was the strong belief that the primary cause of the gap in Black-White student performance was the difference in quality between schools attended by Black students and those attended by White students. Research today frequently documents the challenges to quality faced by schools enrolling a majority of economically disadvantaged Black and Hispanic students.

One indicator of quality is the number of AP courses offered by the school the student attends. Tables 3 and 4 address this question in two ways. First, Table 3 provides a measure of quality of schools as indicated by the number of Advanced Placement (AP) courses available in the schools attended by GMS applicants, both recipients and non-recipients. The 2001 GMS applicants come mainly and disproportionately from high schools offering greater numbers of AP courses. Fully 65% or more of all GMS applicants are from schools that offer four or more AP courses. Nationally, only about 19% of all high schools offered seven or more AP courses in the 2000-2001 school year. By contrast, about 37% of all the schools attended by GMS recipients and non-recipients offered seven or more AP courses. Similarly, while high schools nationally that offer four

to six AP courses comprise just about 18% of all US public high schools, at least 27% of the public high schools attended by GMS applicants offered four to six AP courses.

Table 3. Number of AP Courses Offered at Public High Schools in the GMS 2001 Freshmen Cohort Data and All U.S. Public High Schools

	All U.S. Public High Schools SY 2000-2001		Public High Schools in 2001 Freshman Data		Public High Schools that had a GMS recipient		Public High Schools that had only non-recipients	
Number of AP Courses Offered	N	%	N	%	N	%	N	%
None	5,758	39.2	125	11.9	71	12.4	54	11.3
1 – 3	3,522	24.0	241	23.0	130	22.8	111	23.3
4 – 6	2,626	17.9	286	27.3	156	27.3	130	27.3
7 or More	2,778	18.9	395	37.7	214	37.5	181	38.0
Total	14,684	100.0	1,047	100.0	571	100.0	476	100.0

Data on all U.S. public high schools comes from U.S. Department of Education Office for Civil Rights Data
116 public high schools in the GMS data had no AP course information in the OCR data.

The distribution of schools offering different numbers of AP courses addresses a question about the attributes of the schools attended by the GMS applicants. A different question is examined in Table 4, which shows the distribution of GMS applicants across schools offering different numbers of AP courses. The distributions here show the racial/ethnic differences in matriculation from public high schools offering few or several AP courses. The distributions here also offer the national distributions alongside the GMS distributions. For these data, Table 4 shows that Native Americans and African Americans, both nationally and among GMS applicants, are least likely to be enrolled in schools offering seven or more AP courses. Compared with all other GMS applicants, more than twice as many Native American/Alaska Native (24.6%) applicants were enrolled in schools offering no AP courses. Asian Pacific Islander American applicants (68.2%), Hispanic American applicants (71.4%), and African American applicants (59.1%) were enrolled mainly in schools offering four or more AP courses. By contrast, the proportion of Native American/Alaska Native applicants from this sector of high schools was 45.6%. These percentages for GMS applicants exceed their respective national percentages for each group except Asian Pacific

Islander American applicants. This appears to be mainly because of the substantial percentages from schools offering four to six AP courses.

Table 4. Number of AP Courses Offered at U.S. Public High Schools Attended by Five Racial/Ethnic Groups, SY 2000-2001

Number of AP Courses Offered at the High School	% of White Seniors	% of Native American/Alaska Native Seniors		% of Asian Pacific Islander American Seniors		% of Hispanic American Seniors		% of African American Seniors	
	Entire U.S.	Entire U.S.	GMS 2001 Appli-cants	Entire U.S.	GMS 2001 Appli-cants	Entire U.S.	GMS 2001 Appli-cants	Entire U.S.	GMS 2001 Appli-cants
None	18.2	34.1	24.6	8.2	11.6	14.6	9.0	21.7	12.0
1-3	23.9	25.0	29.7	19.5	20.2	16.3	19.6	24.6	29.0
4-6	23.3	21.3	26.9	22.1	25.3	24.6	28.0	22.9	30.5
7 or More	34.5	19.6	18.7	50.2	42.9	44.6	43.4	30.8	28.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	1,754,156	26,260	111	120,258	391	301,359	334	335,967	566
Missing	78,785	4,106	19	12,393	34	58,421	72	34,417	81

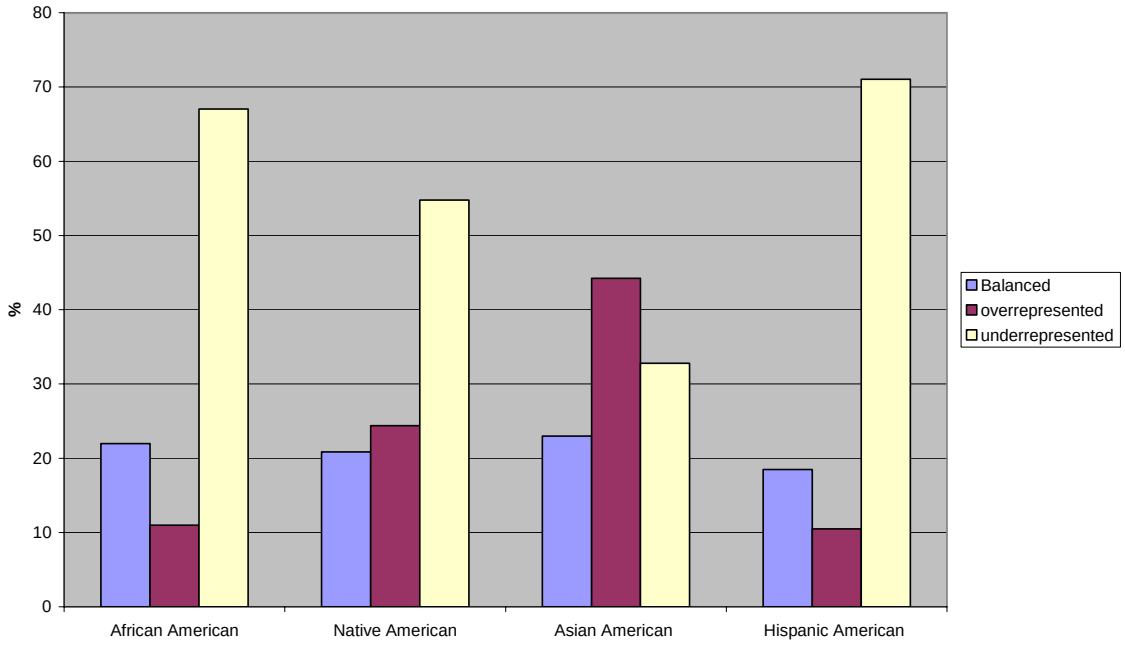
Data on AP course offerings comes from U.S. Department of Education Office for Civil Rights Data.
The GMS N's and proportions have been weighted by the adjusted weight.

In addition to the above measure of school quality, the OCR E&S survey also contains data on participation in Gifted Education, Special Education, Suspensions, and Expulsions by race and ethnicity. A substantial body of research (Coleman et al, 1966; Lee, 1996, 1997, 2000) argues for the explicit examination of school effects. Such effects are believed to be critical in shaping student outcomes. Early on, the findings of such explorations yielded counterintuitive results, suggesting that school-to-school differences were of less significance than other social background measures. We continue this tradition of examining school effects, focusing here on four measures that are constructed in a way that arguably depicts the "fairness" or "equity" climate in the schools attended by GMS applicants (see Appendix for the construction of the measures). These measures, identifying over- and underrepresentation in gifted education, special education, suspension from school, and expulsion from school, are constructed separately for each race and ethnic group represented by GMS applicants. This next section presents the results for each of these indicators of school quality for schools attended by GMS applicants. We begin with our results for Gifted Education.

Gifted Education

Compared with White representation in Gifted Education enrollment, two-thirds of African American GMS applicants came from schools where African American students were underrepresented (see Figure 1). Over 50% of the Native American/Alaska Native applicants were from schools where Native American/Alaska Native students were underrepresented. About one-third of Asian Pacific Islander American applicants were from schools where Asian Pacific Islander American students were underrepresented, and over 70% of Hispanic American applicants from school where students in the same category were underrepresented.

Figure 1. Percentage Distribution of Gates High Schools by Representation in Gifted Education for Each Race/Ethnicity



On average, three racial groups (African American, Hispanic American, and American Indian/Alaska Native) were underrepresented in gifted education compared with White students in the same school. Asian Pacific Islander American students are the only group that on average was not underrepresented compared with White students (mean indices are: 0.68, 0.46, 0.32, and -0.25, respectively).

The racial composition of schools attended by GMS applicants is found to be related to the representation of racial groups in gifted education. Schools with the highest percentage of African American enrollment (75%-100%) were more likely to have a higher representation of African Americans in the gifted program (underrepresented index 41.7 vs. 67-72). The same pattern holds for American Indians/Alaska Natives (18.2 vs. 48.7-65.3). Schools with Asian Pacific Islander American enrollment above 50% were more likely to have Asian Pacific Islanders underrepresented

in gifted programs, which is counterintuitive and contrasts sharply with the results for other racial and ethnic groups.

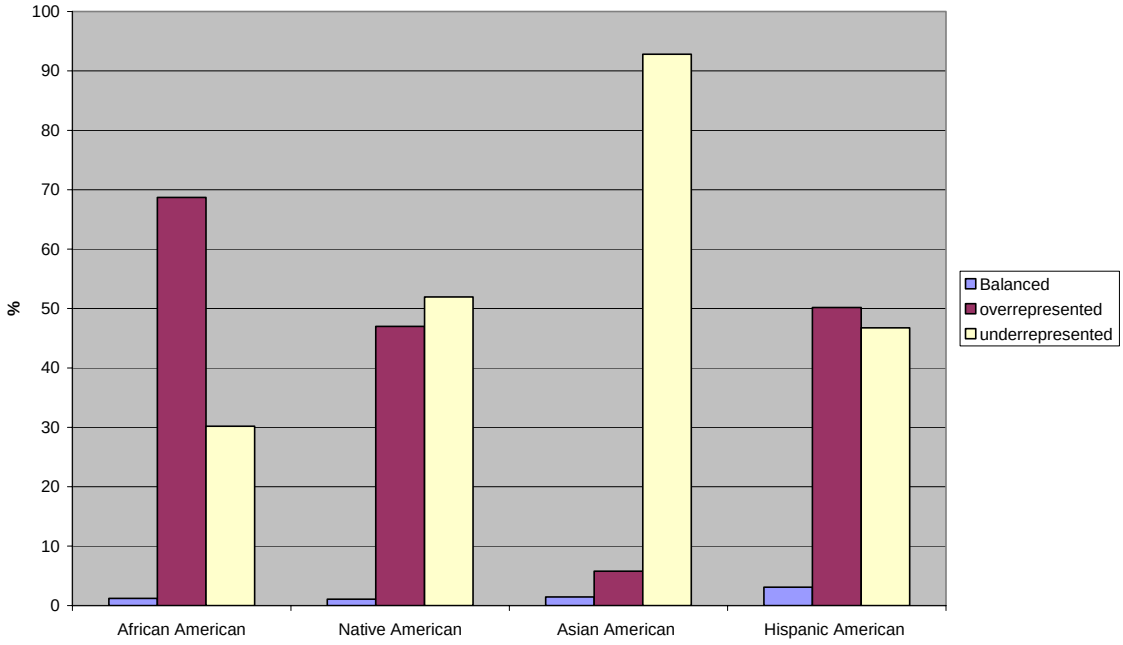
Special Education

For Special Education (see Figure 2), the results also show differences across the four racial/ethnic groups in these data. Compared with White representation in special education, a little over two-thirds of African American GMS applicants attended schools where students of their racial group are overrepresented. Forty-seven percent of Native American/Alaska Native applicants were from schools where Native American/Alaska Native students were overrepresented. About 6% of Asian Pacific Islander American applicants were from schools where their group was overrepresented, and one-half of Hispanic American applicants were from schools where Hispanic American students were overrepresented.

On average, for all the high schools attended by the respondents, and compared with Whites, African Americans were overrepresented in special education while Asian Pacific Islander Americans were quite underrepresented in special education programs. American Indian/Alaska Native and Hispanic students were also underrepresented in special education programs, but not as much as Asian Pacific Islander Americans. (The means are 0.24, -0.81, -0.14, and -0.25).

Applicants from schools with the highest percentage of African American enrollment (75%-100%) were more likely to have lower rates of African American disproportionality in special education programs (the underrepresention index percentage is 53.3 vs. 21.0-33.7). The opposite pattern holds for American Indian/Alaska Native students (27.3 vs. 43.6-55.7). Asian Pacific Islander Americans and Hispanic Americans show no clear patterns.

Figure 2. Percentage Distribution of Gates High Schools by Representation in Special Education for Each Race/Ethnicity

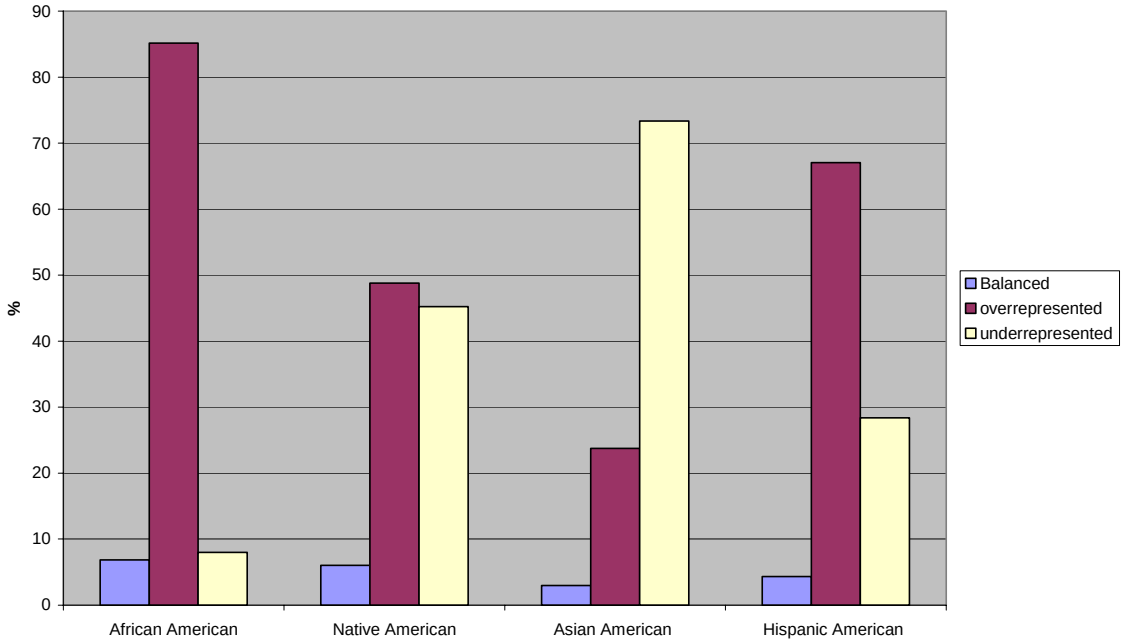


Suspension

Suspension from school or within-school suspension costs students valuable instructional time. Moreover, the fairness communicated by the use of suspensions is an important component of school climate. Compared with White representation in suspensions, 85% of African American GMS applicants are from schools where African American students were overrepresented. About half of Native American/Alaska Native applicants were from schools where their group was overrepresented. About one-fourth of Asian Pacific Islander American applicants were from schools where Asian Pacific Islander students were overrepresented, and one-third of Hispanic American applicants were from schools where Hispanic Americans were overrepresented (see Figure 3).

On average, three racial groups (American Indians/Alaska Natives, African Americans, and Hispanic Americans) were overrepresented when compared with Whites in the same school. Asian Pacific Islander American students are the only ones who were, on average, underrepresented compared with White students (mean indices are: 0.54, 0.96, 0.39, and -0.20, respectively). Schools with higher percentages of Asian Pacific Islanders were more likely to have Asian Pacific Islanders overrepresented in suspension.

Figure 3. Percentage Distribution of Gates High Schools by Representation in Suspension for Each Race/Ethnicity



Expulsions

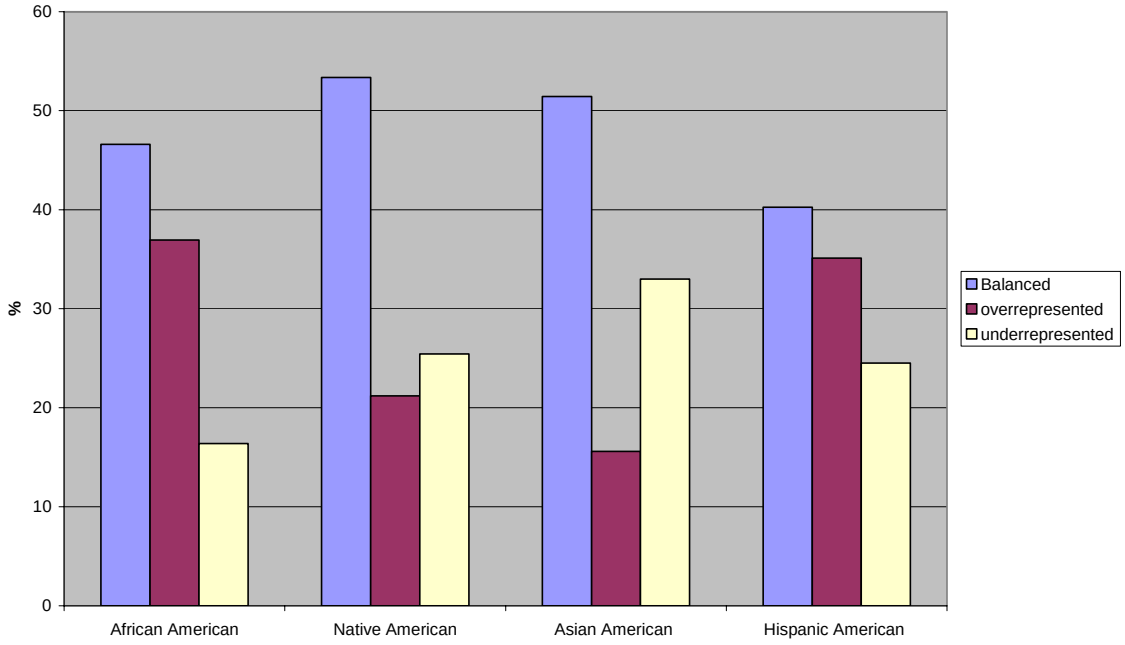
Expulsions, even more so than suspensions, severely restrict and prevent educational growth. Compared with White representation in expulsions, over one-third of African American GMS applicants attended schools where African Americans were overrepresented; 21% of Native American/Alaska Native applicants were from schools where Native American/Alaska Native

students were overrepresented; 16% of Asian Pacific Islander American applicants were from schools where Asian Pacific Islander students were overrepresented, and 35% of Hispanic American applicants attended schools where students from their group were overrepresented (see Figure 4).

On average, the same three racial/ethnic groups (Native Americans/Alaska Natives, African Americans, and Hispanic Americans) were overrepresented in expulsion when compared with White students in the same school. Asian Pacific Islander Americans, again, are the only group that on average was not overrepresented compared with White students (the mean indices are: 0.43, 0.40, 0.18, and -0.03 respectively).

Schools attended by GMS applicants that have more than 25% African American enrollment are likely to have more African Americans expelled. A similar pattern holds for Native Americans/Alaska Natives, Asian Pacific Islander Americans, and Hispanic Americans.

Figure 4. Percentage Distribution of Gates High Schools by Representation in Expulsion for Each Race/Ethnicity



There are no significant differences between GMS recipients and non-recipients for the four indexes for representation in gifted programs, special education programs, suspensions, or expulsions.

Summarizing this section on school climate factors, the following observations are warranted. There are important ways in which respondents' race had implications for participation in gifted programs, special education, rates of suspension, and expulsions. For example, Asian Pacific Islander American applicants are more likely to come from schools where Asian Pacific Islander Americans are either equally or overrepresented in gifted programs. By contrast, applicants from the other three racial groups are less likely to come from schools where students like themselves are equally or overrepresented in gifted programs.

For representation in special education programs, 92.8% of Asian Pacific Islander American applicants were from schools where they were underrepresented in special education programs. By contrast, the percentages for African Americans, Native Americans/Alaska Natives, and Hispanic Americans are 30.1, 52.1, and 46.7 respectively.

The results for suspensions and expulsions are not surprising: African American applicants have the greatest likelihood of coming from high schools where their race group was overrepresented in suspension, and Asian Pacific Islander American applicants have the least likelihood of coming from schools where their race group was overrepresented in suspensions (85.1% vs. 23.7%). The other two groups are in the middle (Native Americans/Alaska Natives: 48.7%, Hispanic Americans: 67.1%). The same pattern holds for expulsions, although the likelihood for each racial group is smaller than for suspension.

College Enrollment

In addition to the general characteristics of the high schools, we explored the college enrollment outcomes for the 2001 GMS applicant cohort. Figures 5 through 7 present the descriptive results for three "types of colleges" measures.

Figure 5. First College/University Type (4-year vs. 2-year) by Gates Status (N = 3934)

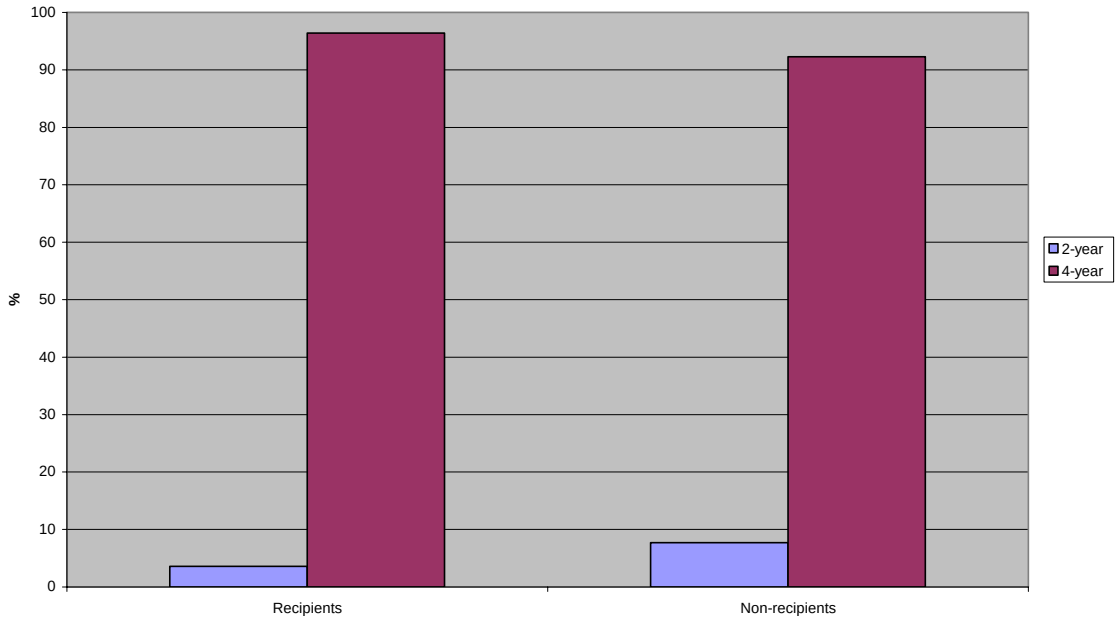
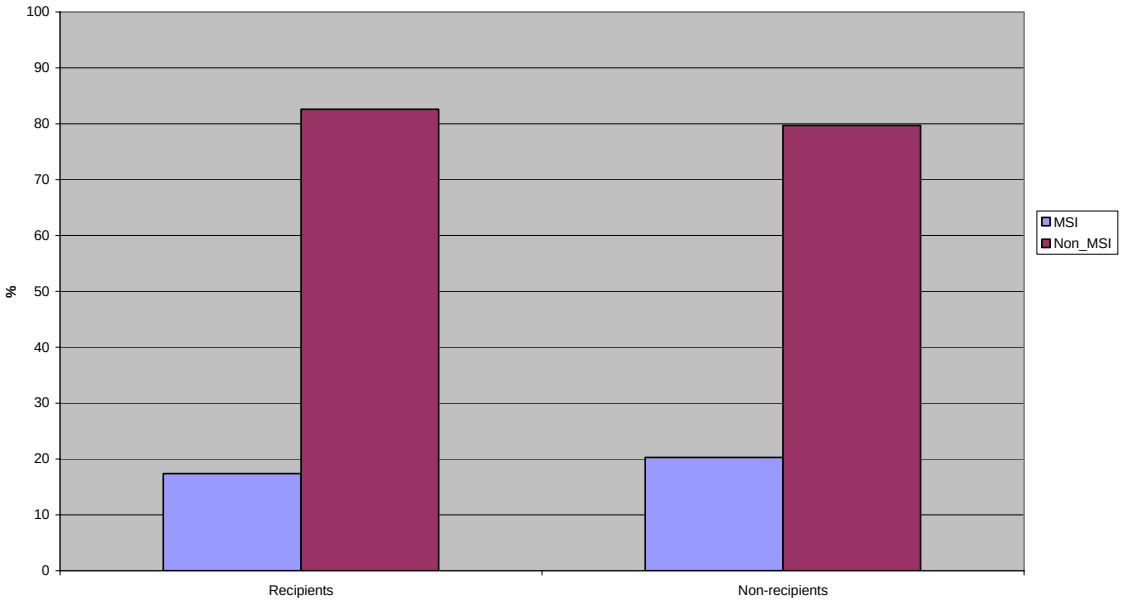


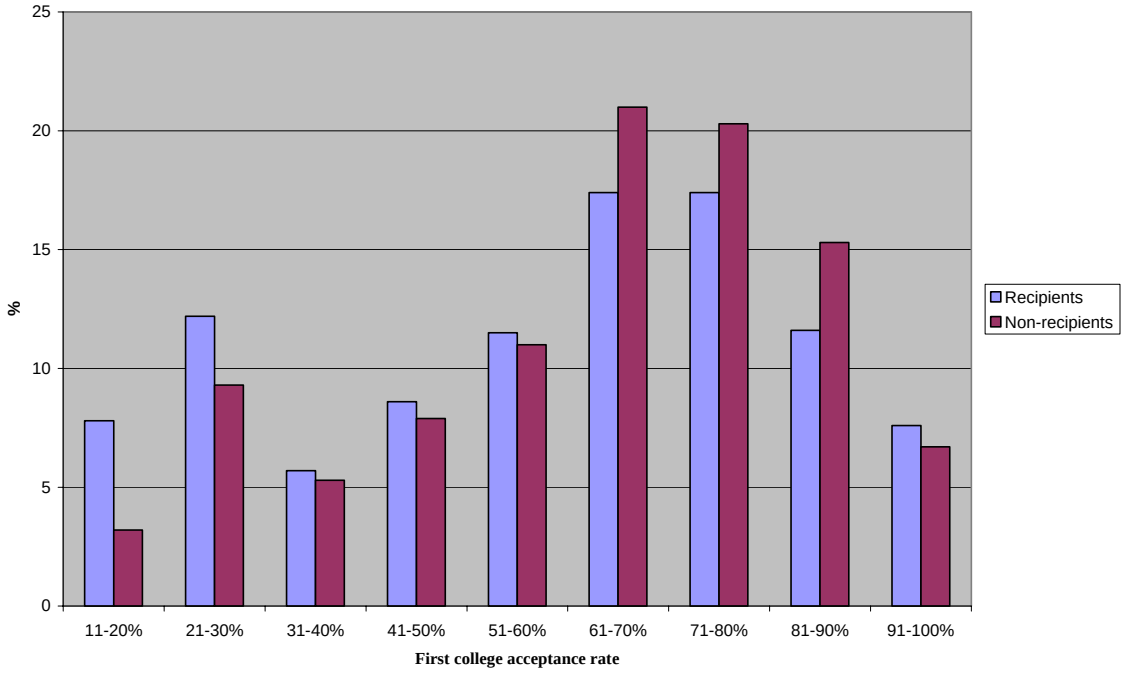
Figure 5 shows that about 93% of respondents went to four-year colleges. A significantly higher proportion of non-recipients than recipients went to two-year colleges (7.7% vs. 3.6%).

Figure 6. First College Type (MSI vs. Non-MSI) By Gates Status (N = 3934)



On a second measure, minority serving status (see Figure 6), about 19.5% of all applicants enrolled in Minority Serving Institutions (MSIs). There was no statistically significant difference between recipients and non-recipients in the rates of enrollment in MSIs.

Figure 7. First College Acceptance Rate for Gates Applicants (N = 3622)



The College Selectivity for colleges attended by GMS applicants, as measured by the acceptance rate reported to U.S. News & World Report by each college or university, is shown in Figure 7. A significant difference was found between recipients and non-recipients in the selectivity of the first college/university in which they enrolled. Recipients attended more selective institutions than did non-recipients (the mean acceptance rate is 58.4% vs. 63.1%). There is a significant difference in the degree of college selectivity of first college enrolled in among the four racial groups of applicants without controlling for other relevant variables. Native American/Alaska Native students, on average, enrolled in the least selective colleges, while Asian Pacific Islander American students went to the most selective colleges among the four groups. The mean acceptance rates—college selectivity—for African American, Native American/Alaska Native, Asian Pacific Islander American, and Hispanic American students are: 63.1%, 72.8%, 58.3%, and 60.6% respectively.

These descriptive results show that there were differences in college-going outcomes for GMS recipients and non-recipients. These data also show differences across race on two of the above measures: attendance at high schools offering different numbers of AP courses and attending selective colleges. Notably, in both instances, Native American/Alaska Native and African American students are more disadvantaged on these measures.

REGRESSION ANALYSES RESULTS

The following discussion presents results from regression analyses focusing on the relative contributions of individual versus school factors in shaping selected outcomes. The above results, based on the examination of the descriptive analyses, are informative and set the stage for examining the relative contribution of the high school origin measures and individual level measures. While such analyses are conducted more frequently using statistical approaches that explicitly estimate "nested" coefficients, the data here do not accommodate such an approach because the GMS student is mainly one case per school. Rather, we employ standard ordinary least squares (OLS) estimates. Table 5 presents a summary of the findings from our OLS regression analyses.

Academic Self-esteem

Academic self-esteem has been shown to be an important factor in explaining educational attainment. We explore its role for GMS applicants. There is a significant association between GMS status and students' academic self-esteem scores. Of the four items comprising the index (see Appendix II for the construction of the index), there is a significant difference between recipients and non-recipients on three items (the exception is the item regarding "students like me do not do well in this college/university"). GMS recipients tend to have a higher level of academic self-

esteem than do non-recipients. The T-test reveals a statistically significant difference in the overall score on academic self-esteem items between recipients and non-recipients.

School attributes explained a statistically significant and substantively meaningful proportion of the variance in students' levels of academic self-esteem, along with parents' education and respondents' race and gender. More specifically, respondents from schools with higher Hispanic American enrollments have lower academic self- esteem, while respondents from schools with higher African American enrollment tend to have higher levels of academic self-esteem. Other school attributes such as size, number of AP courses offered, the student- teacher ratio, and gifted/SPED enrollment also are statistically significant. Students from bigger schools, schools offering more AP courses, and schools that have a smaller student-teacher ratio have higher academic self-esteem. Students from schools that have greater parity in gifted program enrollment also have higher academic self-esteem. Students from schools where minorities are less represented in special education programs have higher levels of academic self-esteem. Overrepresentation in neither suspensions nor expulsions is statistically significant.

GMS respondents' mother's educational levels, race, and gender are all significant predictors of levels of academic self-esteem. Compared with Asian Pacific Islander Americans, African American, Hispanic American and Native American/Alaska Native respondents all have higher levels of academic self-esteem. Males have lower levels of academic self-esteem than females. Mother's educational level has a positive effect on academic self esteem-esteem. These results are informative and mainly consistent with expected patterns of effects for school and background variables. At the same time, the set of predictors explains just 8% of the total variance in academic

self-esteem. Because of the importance of academic self-esteem for subsequent academic pursuits, the impact of school measures on this outcome is an important finding.

Table 5. Summary of Coefficients from the Regression on Selected independent Variables

	Dependent Variables																				
	Academic Esteem		Locus of Control		Educational Expectation			SAT Score				College Selectivity					Gates Status				
Independent Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
Male	–	–			–	–	–	†	†	†	†					†					
Rs father's education attainment					†	†	†	†	†	†	†	–	–	–	–						–
Rs mother's education attainment	†	†	†	†				†	†								–	–	–	–	–
African American	†	†	†	†	†	–	–	–	–	–	–					–	†	†	†	†	†
Native American	†	†	†	†	–	–	–	–	–	–	–	†					†	†	†	†	†
Hispanic American	†	†	†	†		–	–	–	–	–	–		–	–	–	–	†	†	†	†	†
% of Hispanic enrollment in sch	X	–	X	–	X	†	†	X	–	–	–	X					X				
% of Black enrollment in schoo	X	†	X		X	†	†	X	–	–	–	X				–	X	†	†		†
School total enrollment	X	†	X	†	X	–	–	X				X					X				
Number of AP courses offered	X	†	X		X	†		X	†	†	†	X	–	–	–	–	X	†	†	†	
Student-teacher ratio	X	–	X		X			X	†	†	†	X	–	–	–		X				
Gifted program enrollment inde	X	†	X	†	X			X	–	–	–	X	†	†	†	†	X	–	–	–	–
Special education program enro	X	–	X		X	†	†	X	†	†	†	X	–	–	–		X	†	†	†	†
Suspension index	X		X		X	†	†	X	–	–	–	X					X				
Expulsion index	X		X		X	–	–	X	†	†	†	X					X	–	–		–
Locus of control	X	X	X	X	X	X		X	X			X	X				X	X			
Academic esteem	X	X	X	X	X	X	†	X	X	†	†	X	X	†	†	†	X	X	†	†	†
Educational expectation	X	X	X	X	X	X		X	X	X	†	X	X	X			X	X	X	†	†
SAT score	X	X	X	X	X	X		X	X	X	X	X	X	X	X	–	X	X	X	X	†
Constant	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	–	–	–	–
R^2	0.045	0.076***	0.031	0.056*	0.03	0.051*	0.055**	0.23***	0.297***	0.311**	0.327***	0.021	0.073**	0.079**	0.086**	0.273***					
$\chi 2$																	137.665*	1.959**	0.869**	6.886**	8.702***
Degree of Freedom																	6	9	2	1	1

*$p < .05$ **$p < .01$ ***$p < .001$ Numbers in parentheses are standard errors. R-square change from previous model is significant at $p < .05$ or better.

†---positive coefficient; – ---negative coefficient; X---variable was not included in the equation

Student-teacher ratio = total enrollment/# of full time teachers

Gifted program index = % of White in Gifted program/% of White in school - % of Black (Native, Asian, Hispanic) in gifted program/% of Black (Native, Asian, Hispanic) in school

Special education(SPED) index = % of Black (Native, Asian, Hispanic) in SPED/% of Black (Native, Asian, Hispanic) in school - % of White in SPED/% of White in school

Suspension index = % of Black (Native, Asian, Hispanic) in supension/% of Black (Native, Asian, Hispanic) in school - % of White in suspension/% of White in school

Expulsion index = % of Black (Native, Asian, Hispanic) in expulsion/% of Black (Native, Asian, Hispanic) in school - % of White in expulsion/% of White in school

Locus of control

Attribution theory seeks to explain how individuals assign causes for the outcomes and experiences they have. Locus of control is the construct that summarizes such attributions. The theory holds that, in general, an "internal" (individual/personal acceptance of responsibility) locus of control is more supportive of higher attainment. Some research (Gurin and Epps, 1975; Gurin et al,

1978) suggests that externality might be more appropriate for some populations. We explore the role of attribution for these respondents.

There is a significant difference between GMS recipients and non-recipients in the ratings on all five items comprising our measure of locus of control (see Appendix II for the construction of the index). GMS recipients are more likely to feel that they have control over their plans and their lives compared with non-recipients.

School attribute measures contribute significantly to the explained variance for locus of control for GMS applicants, along with parents' education and respondents' race and gender. Specifically, higher Hispanic American enrollment levels are found to be negatively associated with students' locus of control. Respondents from schools with closer parity between white and minority students in gifted program enrollment exhibit higher locus of control scores.

Mother's educational level has positive implications for applicants' locus of control. Father's educational level does not have a significant effect. Other things being equal, African American, Native American/Alaska Native, and Hispanic American students have higher levels of locus of control than do Asian Pacific Islander American students. Again, however, all variables in the equation explained only 6% of total variance in locus of control. Still, the noted role of school factors for locus of control suggests the importance of school factors for subsequent outcomes.

Educational Expectations

Students' educational expectations have been shown repeatedly to be consequential for subsequent educational attainment. In our analyses, we find that school attributes, along with background information, added significantly to the prediction of educational expectations.

Respondents from schools with higher percentages of African American or Hispanic American students tend to have higher educational expectations. Schools where minority students are less often suspended or expelled have favorable implications for students' educational expectations.

In addition, higher academic self-esteem is found to be beneficial for educational expectations. In contrast to the preceding variables, father's educational level has a positive effect on educational expectations, while mother's educational level does not. However, being male is negatively related to educational expectations, and Native American/Alaska Native and Hispanic American students are found to have lower levels of educational expectations than Asian Pacific Islander Americans.

SAT Test Scores

GMS applicants were not selected on the basis of their SAT or ACT scores. Nonetheless, we would expect that SAT scores would be especially susceptible to school effects. For these data, attributes of schools attended by GMS applicants contribute significantly to the predication of SAT scores after controlling for other variables in the equation. All school attribute variables except school size are statistically significant for SAT scores. Applicants from schools with higher proportions of African American or Hispanic American students have lower SAT scores. Those from schools with a smaller student-teacher ratio or more AP courses have higher SAT scores. Schools with greater parity in gifted program participation or those favoring minorities in the gifted program have a positive effect on SAT scores. Schools with fewer minorities suspended or expelled have a positive effect on SAT test scores also. Finally, both higher levels of students' educational expectations and academic self-esteem correspond positively with their SAT scores.

In contrast to earlier occurring outcomes, being male is positively related to students' SAT scores. Finally, Native Americans/Alaska Natives, African Americans, and Hispanic Americans have lower SAT scores than Asian Pacific Islander Americans.

College Selectivity

One critical outcome variable we examine is college selectivity. We are especially interested in identifying high school effects for the degree of selectivity of the first college enrolled in by the applicants. Column 5 of Table 5 presents the results.

Students' background information, school variables, SAT/ACT score, educational expectation, and self-concepts (academic self-esteem and locus of control) all explained significant amounts of the variance in college selectivity. When school variables were added to the model (number of AP courses, the student-teacher ratio, parity of gifted program participation, and special education program enrollment), all were found to be significant predictors of college selectivity. Respondents from schools offering more AP courses, and those from schools where gifted program participation is more equally distributed compared with white students, are more likely to enroll in more-selective colleges. The effect of school attribute measures remains the same even after controlling for locus of control, academic self-esteem, and educational expectations. However, after entering SAT scores, the parity in special educational program enrollment is not significant. Respondents who have higher levels of academic self-esteem are in less selective colleges. This is true even after controlling for all other variables considered. SAT score is also significant; students with higher SAT scores are in more-selective colleges. After controlling for school, individual attributes, and SAT score, African American and Hispanic American students enrolled in more-

selective colleges than Asian Pacific Islander students, and male students enrolled in less-selective colleges than females.

GMS Status

The final outcome measure we assess here is GMS status, i.e., whether or not the applicant received a GMS award. Here, again, understanding the role of school factors in the selection of an applicant as a Scholar has important implications for the program as well as for the identification and selection process itself. For example, admissions offices at colleges and universities traditionally often use such findings to build a list of high schools that will offer the "yield" of applicants they desire.

When adding all nine school variables into the model with background information, the change in the explained variance is significant. Therefore, school attributes make a substantial contribution to the prediction of the probability of being selected as a Gates Millennium Scholar. Students from schools with more AP courses or schools with a higher percentage of African American enrollment have a greater likelihood of being selected as Scholars. Students from schools where minorities are more represented in gifted programs than whites or where minorities are less represented in expulsions have a better chance of being Scholars. Even after controlling for other variables, the effect of the percentage of African American enrollment, gifted program participation, special education enrollment parity, and expulsion parity all remain statistically significant. The effect of number of AP courses, however. is not statistically significant.

Students' race, gender, SAT scores, and educational expectations are important in a favorable way for becoming a GMS recipient. After controlling for school and individual background, students with higher SAT scores have a greater likelihood of being selected as

Scholars. After controlling for all other variables considered in the model, females have a slightly better chance of being recipients than males. African American, Hispanic American, and Native Americans/Alaska Natives each have a greater likelihood of selection as recipients compared with Asian Pacific Islander Americans. Those whose parents have less education have a better chance to receive a GMS award, which may reflect the GMS policy requiring applicants to be Pell-eligible. And finally, the higher one's educational expectations, the greater the chance of becoming a Scholar. This is true after controlling for all other variables.

CONCLUSION

The findings reported here are both illuminating and important. It is especially important to note the role of the school factors as determinants of selection as a Scholar. In short, schools do make a difference. In addition to schools offering the opportunity to learn at high levels, as indicated by the number of advanced placement courses they offer, it also is important, based on these data, that schools maintain a climate of fairness as referenced by equitable rates of participation in gifted programs and parity in rates of representation in special education, expulsion, and suspension across racial and ethnic groups.

These school factors are shown to be consequential for antecedent outcomes also that are determinants of these later academic outcomes. Finally, this set of findings provides evidence that there are high schools that produce solid performers who are minority students with high economic need. It will be important to learn more about why and how the school factors are important in order to determine the extent to which the attributes of these high schools are replicable.

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Appendix I. Construction of indices of representation of minority groups in gifted education, special education, suspension, and expulsion

Gifted program index = % of White in Gifted program/% of White in school –
% of Black (Native, Asian, Hispanic) in gifted program/% of Black (Native, Asian, Hispanic) in school

Special education index = % of Black (Native, Asian, Hispanic) in SPED/% of Black (Native, Asian, Hispanic) in school –
% of White in SPED/% of White in school

Suspension index = % of Black (Native, Asian, Hispanic) in suspension/% of Black (Native, Asian, Hispanic) in school –
% of White in suspension/% of White in school

Expulsion index = % of Black (Native, Asian, Hispanic) in expulsion/% of Black (Native, Asian, Hispanic) in school –
% of White in expulsion/% of White in school

Appendix II. Construction of indices of academic self-esteem and locus of control

Item	Response Range	*Scale Scores* Minimum	Maximum
Academic Self-esteem			
Students like me do not usually do well	Strongly agree to strongly disagree	0	3
I expect to be an honor student at this college/university	Strongly disagree to strongly agree	0	3
I could get higher grades in a major that suited me better	Strongly agree to strongly disagree	0	3
I am afraid that I may not make it in college or in a university	Strongly agree to strongly disagree	0	3
Total		0	12
Cronbach's Alpha		0.579	
Locus of Control			
I don't have enough control over the direction my life is taking	Strongly agree to strongly disagree	0	3
In my life, good luck is more important than hard work for success	Strongly agree to strongly disagree		3
Every time I try to get ahead, something or somebody stops me	Strongly agree to strongly disagree	0	
My plans hardly ever work out, so planning only makes me unhappy	Strongly agree to strongly disagree	0	3
When I make plans, I am almost certain I can make them work	Strongly disagree to strongly agree	0	3
Total		0	15
Cronbach's Alpha		0.700	

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