

Black-White Test Score Gap & Academic Achievement

**The Black-White Test Score Gap and Academic Achievement in College: Parsing
the Impact of Distal Socio-Economic Factors**

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Abstract

Controversy regarding the use of standardized tests in college admissions and for the prediction of college grades has a long history (Cronbach, 1975), but continues to be a concern (Atkinson, 2001; Helms, 1992; Kane, 1998). The present study examines racial differences in the prediction of college academic achievement for a large sample of students attending a selective public university over a ten-year period. College academic achievement was defined as first semester grade point average which served as the dependent variable. Independent variables consisted of standardized test scores, high school grades, socio-cultural capital (operationalized as Median Household Income), and gender. The data were analyzed using multiple regression techniques. All independent variables were found to predict college achievement at a statistically significant level for both African American ($n=2,546$) and Caucasian ($n=19,929$) students ($p<.01$). High School Grade Point Average was the stronger and more consistent predictor of college grades for Caucasian students, while SAT score was the stronger and more consistent predictor of college achievement for African American students. Socio-cultural capital was found to have a stronger effect on SAT for African American students than for Caucasian students. Implications for the role of socio-cultural capital in college achievement are discussed as are limitations for predicting college grades.

**The Black-White Test-Score Gap and Academic Achievement in College: Parsing
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College academic achievement is one of the most widely studied of topics (Adelman, 1995; Astin 1971, 1993; Cole, 1973; Feldman and Newcombe, 1969; Holland, 1963; Kulik, Kulik and Schwalb, 1983; Pascarella and Terenzini, 1991; Stanley, 1971; Tinto, 1987). Academic achievement in college is influenced by a wide variety of factors, including student abilities, effort, study habits, and performance on course evaluation measures such as examinations or other assignments (Astin 1993; Hills, 1971; Pescarelli & Terenzini, 1991). Selective universities, as opposed to open admissions colleges, seek to identify and admit students who possess a set of characteristics suggesting that they have the requisite tools to perform well and succeed academically in competition with the other well-prepared students who are admitted. To do otherwise would be a disservice to students who were admitted, but were unprepared to compete academically against their peers. Thus, the prediction of academic achievement at selective universities is important because no one wants to admit students who have a low probability of success in a competitive college environment.

In deciding which students to admit, selective colleges often face an embarrassment of riches: they have far more applicants than spaces available. One consequence is that selective colleges typically have a broad constellation of factors to examine as they review applications presented by the many highly qualified students who seek admission. Bowen and Bok (1998) point out that only about 20-to-30 percent of American colleges and universities constitute the elite tier who face this dilemma.

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Although college admissions officers consider a variety of factors when deciding which students to admit, including leadership, letters of recommendation, special talents, or community service, they rely heavily on two important variables: high school grades and standardized test scores. The reason is a rather straightforward heuristic: traditionally the best predictor of future success in a given domain is past success in that, or a related, domain. Indeed, high school grades and standardized test scores have long been found to be predictive of academic achievement in college (Astin, 1971, 1993; Cleary, et al, 1975; Haney, 1993; Hills, 1971; Thorndike, 1971; Nettles, et al, 1997).

Yet, both prior grades and test scores have their shortcomings when it comes to gauging academic promise for college. Hills (1971) found school grades to be contaminated by a variety of factors, including handwriting, general verbal ability, or personal attractiveness. Hills also noted that both in high school and college, grading standards vary by instructor, department and level within an institution, as well as by administrative practices such as discounting or ignoring performance in certain situations.

Similarly, the use of standardized tests has remained a public controversy for almost a century (Hewer, 1965; Cronbach, 1975; Linn, 1982; McCornack, 1983; Ravitch, 1983). In recent years, however, the use of standardized test scores in college admissions has received even closer scrutiny. The reasons are many, but include concerns about the Black-White test score gap (Herrnstein and Murray, 1994; Thernstrom and Thernstrom, 1997; Jenckes and Phillips, 1998; Vars and Bowen, 1998; Kane, 1998), concerns about the predictive power of test scores (Bowers, 1970; McNemar, 1975; Haney, 1993; Atkinson, 2001; Geiser and Studley, 2001), and concern about the cultural equivalence of cognitive ability test scores (Helms, 1997). Such concerns raise questions about the

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usefulness of standardized test scores in the college admissions process, particularly in comparison to the usefulness of high school grades. Are high school grades a better predictor of college achievement than test scores? How do the relationships between high school grades, test scores and college grades compare across racial groups? Do the predictor-criterion validity coefficients have the same meanings across racial groups? Such questions in turn beg related questions: What accounts for the observed Black-white test score gap? Why is it that the ability to predict college achievement is not stronger?

Despite concerns about test scores, they remain in use because of their predictive ability, particularly when used in conjunction with prior grades (Hills, 1971; Willingham, 1998; Camera and Echtenracht, 2000). That is, in general those students who score high on standardized tests tend to earn higher grades in college than do those who score low. But test scores and grades together do a better job of predicting college achievement than either does alone (Hills, 1971; Domino, 2000). Existing studies, however, generally have not focused on the student's place of residence when predicting achievement or interpreting validity coefficients. Carnevale and Rose (2003) point out that although "American high schools vary widely in quality, there is no accessible measure that differentiates high schools by their relative levels of advantages." Yet, sociologists have indicated that one's place of residence is an important mediator of social status, occupational advancement, and economic rewards (Putnam, 2000). For example, Wilson (1987) observed that: "Whites and blacks reside in areas that are ecologically and economically very different. Consequently any relationship involving race would reflect to some unknown degree the relatively superior ecological niche whites occupy with respect to jobs, opportunities, and exposure to role models." In other words, where one

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resides amounts to a resource that bestows considerable benefit. Sociologists have referred to this resource as either cultural capital (Millman, 1987) or as social capital (Hanifan, 1916; Wilson, 1987; Conley, 1999; Putnam, 2000). For purposes of this study I shall refer to it as socio-cultural capital. Putnam (2000) offers several ways of conceptualizing socio-cultural capital that are of relevance to the present investigation, observing, for example, that socio-cultural capital includes social networks and norms of reciprocity that facilitate mutual benefit. “In short, social networks have undeniable monetary value,” (Putnam, 2000).

Other researchers are similarly instructive with respect to the concept of socio-cultural capital: “Dozens of studies...have found that at all levels of social hierarchy and in all parts of the economy, social capital is a powerful resource for achieving occupational advancement, social status, and economic rewards...” (Burt, 1999). The jobs people get, bonuses and promotions they receive, and the incomes they earn are all influenced by social capital (Carroll & Teo, 1996; Belliveau, et al, 1996). In this regard, one’s income reflects not only human capital (e.g., education and experience), but also one’s social capital in the form of social networks. Thus, to some unknown extent, individual earnings are accounted for by social forces embedded in one’s community. The more social capital one has, the more opportunities, more advancements and the more money one has. Social capital reflects the consequences of one’s social position (Loury, 1997). Feld and Carter (1998) suggest that where students live and the neighborhoods to which they belong affect social interaction in school as well. Thus, where one lives is an indicator of social capital; people who live in wealthier communities tend to have greater volumes of social capital.

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Research also has described the influence of socio-cultural capital on school attainment. “Social capital has wide-ranging positive effects on a child’s opportunities and development, particularly in school... Social capital matters for children’s successful development. We can draw the same conclusion about the link between social capital and school performance” (Putnam, 2000). It is conceivable that the effect of socio-cultural capital would also be at work at the college level. Again, Carnevale and Rose (2003) provide useful perspective, indicating that residential patterns tend to segregate students by socio-economic status among high schools:

Youth in high-income families with educated parents are doubly advantaged. They find college, especially the more selective colleges, more affordable. More importantly, their childhood and adolescent development are nested in neighborhoods, high quality schools, and home environments that provide the necessary social support, information and encouragement for academic readiness for college. As the strength of the relationship between education and income grows, families with the highest incomes are increasingly likely to be parents with the highest level of educational attainment. Conversely, low-income families have parents with low education levels.

Selective universities in particular are not only more expensive to attend, they typically attract some portion of their students from a national audience; that is, they attract students not only from throughout a given state, but from different regions and states around the country as well. Students from different communities will have had experiences that reflect the socio-cultural capital associated with those communities, including those experiences that are educationally related such as school quality. Thus, simply to examine college achievement without regard to residency is to further contaminate prior (i.e., high school) grades as a research variable; that is, the wide net

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cast by the selective university means that the students admitted will come from a variety of more-or-less distinct communities, each shaped by the influence of its own socio-cultural capital. It is conceivable, even likely, that students schooled in different states potentially will have experienced differing state mandated standards, curricula, and sequencing in instruction. This is a non-trivial concern precisely because of the resources and opportunities that are linked to residency in a particular location. Moreover, these considerations serve to mitigate the meaning that can be associated with income as a measure of social status across different states. For example, an annual household income of \$60,000 does not mean the same thing in New York state as it does in Arkansas. The cost of living varies by state, including variation in such factors as the personal income tax or sales tax rates.

For reasons outlined above, when examining the validity of prior grades and standardized test scores for the prediction of college academic achievement, research may be informed by another look at their relationship and one that takes into account the contribution of residence-based socio-cultural capital (operationalized as median household income) that students bring with them to the college setting.

METHOD

Subjects

Participants for this study were 22,475 students who were either African American or Caucasian and enrolled as college freshmen in the fall term of years 1991 through 2000, inclusive. The students represent 67% of all students who enrolled as freshmen for the years examined and were selected on the basis of being classified in university records as

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“in-state” residents (as opposed to out-of-state residents). Effectively this classification defines where each student’s parents resided and where the student attended high school when the student applied for admission. An important variable for examination by this study is median household income, the meaning of which can vary from state-to-state. By limiting the study to “in-state” residents we can have more confidence in the meaning attached to household income as an index of socio-cultural capital. The limitation provides the added advantage that all subjects met a set of high school curriculum requirements established by a single state rather than a variety of such requirements established by the different states or even different countries in which the remaining one-third of students were raised.

Variables

Dependent Variable: The study is concerned with student academic achievement, therefore, the Dependent Variable is the college grade point average earned by students in the first fall term of enrollment (FGPA) and which could range from 0.0 to 4.0.

Independent Variables: Two independent measures of academic achievement were used and these were the student's high school grade point average (using a 4.0 scale) and the student's score on a standardized test required for college admission consideration. Two tests could meet this latter requirement: the combined verbal and math scores on the SAT (formerly the Scholastic Aptitude Test) or the composite score for the ACT -Test (formerly the American College Testing Program Test). Using a conversion table supplied by the testing agency (Dorans, et al, 1997), ACT-Test scores were converted to the SAT scale (i.e., corresponding to the total score for the SAT verbal and math

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sections) and the SAT-Total scale was used for all analyses reported here. All academic achievement measures were obtained from computerized files of the university's registrar's office representing official records. In addition, a socio-cultural capital measure was established for each student based on zip code of permanent residence and defined as the median household income (HHI) for a given zip code in the state as determined by the 2000 Census of the United States. That is, median household income for a given zip code was taken as indicative of the level of socio-cultural capital typical in that community, and, therefore, is representative not merely of family income, but also social networks, economic contacts, and norms of reciprocity that facilitate mutual benefit in that community (Wilson, 1987). There were 962 distinct zip codes for the state in question. Each student was assigned a socio-cultural capital index consisting of the median household income for the community (i.e., the zip code) where the family resided. For analysis purposes students also were classified by race and gender.

Analyses

Data were analyzed using correlation and multiple regression techniques because of their value in assessing the validity of predictor variables and in accounting for variance in the variables being examined.

RESULTS

Table 1 reveals the means and standard deviations of the variables of interest for study participants based on race. Caucasian students obtained higher scores than African American students on each of the academic achievement measures and also came from communities with higher median household incomes.

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Insert Table 1 about here

Table 2 is a correlation matrix showing the Pearson correlation coefficients for variables of interest by race (African Americans are represented above the diagonal, while Caucasians are represented below the diagonal). For Caucasians, all of the variables are significantly intercorrelated ($p < .01$), however, the correlation between SAT score and Median Household Income (HHI), and between First-term Grade Point Average (FGPA) and Median Household Income (HHI) is very small suggesting that the high power of the large sample size resulted in low correlations that were statistically significant. Also for white students, the dependent variable, First-semester Grade Point Average (FGPA), is most strongly correlated with High School Grade Point Average (HSGPA), followed by SAT score, indicating that the higher one's High School Grade Point Average or SAT score, the higher one's college achievement as measured by First-term Grade Point Average. High School Grade Point Average had a significant negative correlation with Median Household Income, indicating that white students from wealthier communities tended to earn lower grades in high school than white students from less wealthy communities.

Insert Table 2 about here

For African American students, all variables also were significantly intercorrelated with the exception of the correlation between High School Grade Point

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Average (HSGPA) and Median Household Income (HHI) which was essentially nil. The dependent variable, First-term Grade Point Average (FGPA), was most strongly correlated with SAT score, followed by High School Grade Point Average (HSGPA), indicating that the higher one's test score or High School Grade Point Average, the higher the First-term Grade Point Average earned in college. The correlation between First-term Grade Point Average and Median Household Income was positive and significant for black students and was about the same size as the correlation for white students, but in the opposite direction. The correlation between SAT and High School Grade Point Average was about the same size and direction for black students as for white students ($r = .273$ and $.281$, respectively). However, the relationship between SAT and Median Household Income was more than 10 times as large for black as for white students.

Insert Table 3 about here

Table 3 is a summary of separate Multiple Regression analyses by race employing the variables of interest. For both the African American students and the Caucasian students, the models were significant. In both cases, the regression analyses indicated that being female was a significant predictor of achievement as was Median Household Income (HHI), and in both cases the direction and magnitude of the B was the same for gender and for Median Household Income. Also for both groups, High School Grade Point Average (HSGPA) and SAT scores were significant predictors of achievement and were stronger than gender or Median Household Income as indicated by larger B

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coefficients. But for white students, High School Grade Point Average was the strongest predictor, while for black students SAT score was the strongest predictor. Multiple Regression analyses were also performed for each of the ten years of data and revealed minor year-to-year variation from the overall analysis. Figures 1 and 2 are bar graphs showing the standardized Beta coefficients for High School Grade Point Average (HSGPA) and for SAT scores for Caucasian and African American students, respectively. Figure 1 shows that for white students, in eight of the ten years examined High School Grade Point Average was a stronger predictor of First-term Grade Point Average (FGPA) than was SAT score and that the Beta coefficients for both rather consistently ranged between about .20 and .30. In contrast, Figure 2 shows that for Black students, High School Grade Point Average (HSGPA) was the stronger predictor in only four of the ten years examined; SAT was the stronger predictor of First-term Grade Point Average in six of the ten years. Also, for Black students there was less consistency in the size of the B coefficients, with greater variation seen for High School Grade Point Average (B ranged from .03 to .26 for High School Grade Point Average, and from .12 to .37 for SAT score).

Insert Figures 1 and 2 about here

Table 4 addresses a recurring matter of concern with respect to SAT scores as a predictor of college achievement and that concern has to do with the influence of socio-economic status on test scores. Because the variables studied here are intercorrelated it is possible to determine the degree of relationship between SAT and Median Household

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Income by partialling out the effects of High School Grade Point Average. The result of this partial correlation between SAT and Median Household Income, controlling for High School Grade Point Average, shows that the correlation between SAT and Median Household Income is significant for both groups, but more than four times greater for black students than it is for white students. Fisher's transformation was applied to the correlation coefficients of the two groups and resulted in a $z = 9.098$ ($p < .001$), establishing that the difference in size of correlation coefficients between the two groups was significant. To interpret this finding we need to imagine a hypothetical excellent black high school student; that is, one with a High School Grade Point Average of 4.0. If such a student came from a community with the same Median Household Income as the typical white students in this study, she would earn an SAT score that is 43 points higher in comparison to herself from a community with Median Household Income equal to the mean for blacks in the study. That is a difference equal to about a quarter of a standard deviation in SAT score.

Insert Table 4 about here

DISCUSSION

The level of academic achievement attained by any given student is the result of a wide variety of complex human behaviors. Although ability and preparation, as measured by high school grades and standardized test scores, may provide the base for college achievement, such factors as managing independence, adjusting to novel situations,

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motivation, effort, or study habits also are recognized to have an impact. Among the other characteristics one might envision that also could affect achievement are conscientiousness, openness to new ideas and experiences, willingness to ask for and to follow advice, and insights gained from related experiences. Arguably the importance of these factors is exacerbated in the selective college environment due to increased competition to excel. Findings reported here support the idea that residence and socio-cultural capital play an important role as well.

With respect to college admission and the prediction of college achievement, controversy over the role of standardized test scores has continued unabated (Atkinson, 2001; Cole, 1999; Lemann, 1999; Sacks, 1999). The results reported above provide another look at some of the issues involved. An important first question has to do with the validity of test scores as a predictor of college grades in comparison to high school grades. That is, are high school grades a better predictor of achievement than SAT scores? Findings reported here for a selective university indicate that high school grades were a better predictor of college achievement than test scores for whites, but for blacks, more often than not, SAT was the better predictor.

These findings may well reflect conditions in urban schools which have fewer resources and offer fewer opportunities for rigorous academic development (e.g., access to advanced placement courses), and which also tend to be located in poorer school districts, in contrast to the quality of suburban schools, which tend to be located in wealthier communities and racially are predominantly white. As reported by the Education Trust (1996), urban school districts are twice as likely to hire teachers who have no license or who have only an emergency or temporary teaching license (Oakes,

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1990; Darling-Hammond, 1996). Moreover, more urban schools lack access to rigorous curricula and well-prepared teachers than suburban schools. In fact, Gray, Nettles, Perna and Edelin (1999) report that “the spoils of today’s de facto segregation are related to social class and the quality of schools that are distributed according to race and class. Neighborhoods are largely segregated and students attend segregated schools: 30% of blacks & 32% of Hispanics attend schools in urban centers; only 5% of whites do.” A relative lack of access to advanced placement courses and less rigorous instruction by less qualified teachers means that those attending urban schools tend to have fewer opportunities for the quality and breadth of educational development than is common in wealthier suburban school districts. Thus, the same grade in the same subject from two schools of such distinct quality can have very different meanings, rendering the grades earned in the poorer school district less reliable as predictors of college achievement in comparison to grades earned in wealthier school districts.

SAT score, which is normed on a nationwide basis, may provide a more reliable measure of academic background than high school grades for students from poorer communities because it balances school-to-school differences and provides a standard for comparison. It should be emphasized that in this context SAT score is not a measure of aptitude, rather one of abilities developed so far given the student’s particular set of education experiences. In fact, this is all that any such measure can be. In contrast, it is probable that differences in school quality make High School Grade Point Average a more reliable measure of academic background for students from wealthy communities than it is for students who reside in poorer communities. In other words, although two hypothetical students, one from a wealthy school district and one from a poor school

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district, could both have high school transcripts reflecting a grade of “A” in the same course, it is likely that their learning environments were quite different. As a result, the student from the wealthier district is likely to have accrued certain academic benefits that would make her more competitive in the college classroom. Thus, the grade of “A” from the wealthier district would carry somewhat stronger weight as a predictor of college grades than would the same grade from a poorer school district.

A difference in the predictive power of grades for the wealthier versus the poorer school district would not mean that the student from the poorer community could not have earned a higher grade had she attended school in the wealthier community; rather it would merely be a reflection of the curriculum and instruction provided by the school attended. In fact, it is likely that whatever the academic background with which students emerge from high school, that background principally is the result of what was taught and how it was taught rather than an inherent characteristic of the students themselves. Blacks overwhelmingly attend segregated schools with unequal resources available to them. Thus, both grades and test scores may merely reflect the unequal educational experiences of students (Nettles and Nettles, 1999). This is a critically important observation given recent research showing that the rigor of the high school curriculum is the dominant factor in determining college attainment (Adelman, 1999).

The point is further driven home by the role of socio-cultural capital as measured by level of household income in the communities where study participants lived. Median Household Income was found to have a positive correlation with SAT for both African American and Caucasian students, but that relationship was more than four times stronger for the African American students. Yet, the black students came from communities with

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Median Household Incomes that were more than \$20,000 less than that of white students. Black students experienced a double detriment in this regard: upon entering college they had less socio-cultural capital than white students, and it was more important to their performance on the SAT. If a hypothetical excellent black student had the same level of socio-cultural capital as the typical white students in this study, that black student could be expected to earn 43 points higher on the SAT. Moreover, because each of these variables is correlated with First-term Grade Point Average, academic achievement in college would be expected to improve as SAT and Median Household Income increased as well.

It is important to emphasize that the notion of socio-cultural capital is not simply one of income size; rather it includes networks, connections, and opportunities as well. Thus a given person's human capital, e.g., one's education, experience, or earnings, represent only part of one's social capital, but is indicative of the scope of resources one has available. The role of socio-cultural capital may be illustrated by examining the relationship between representative job categories and income and also by looking at the academic achievement of students who were high scorers on the SAT. Figure 5 is a graph showing some representative job categories and their annual incomes in 1999 dollars based on census data for the state in question. One sees that the job category of Food Preparation was at the bottom of the scale with median annual earnings of about \$17,000; in contrast, at the top of the scale were physicians whose median annual earnings stood at about \$120,000. A community in which median annual earnings are \$17,000 is not likely to have many physicians or other professionals in residence. One consequence is that such communities will not have accessible to them the wide variety of networks and

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resources that higher salaries command. Similarly, a community in which median household income is in excess of \$100,000 annually is essentially out of reach as a place to live for those earning less than \$20,000 annually. The cultures of these two economically distinct communities are as disparate as their incomes. The schooling, networks, resources and opportunities available to children in these two communities are as circumscribed as their residences. Aside from economic transactions, it is unlikely that the physician and food preparation worker, or their children, will ever interact in meaningful ways socially unless the two sets of children go to the same college.

Insert Figures 3, 4 and 5 about here

SAT scores and prior schooling are influenced by socio-cultural capital (Median Household Income), while High School Grade Point Average is a reflection of residence and Median Household Income; each of these variables is related to First-term grade Point Average. Thus, the data in this study provide a basis for another look at the black-white test score gap (Jenckes, 1998) by examining the characteristics of high scorers. Table 5 shows means and standard deviations for the Median Household Income, High School Grade Point Average, and the First-term Grade Point Average, respectively, of students who were high scorers on the SAT by race. High scorers were defined as students who scored 1,400 or above (i.e., two standard deviations above the mean) for the SAT-Total (i.e., combined verbal and math scores). For this select group of students, it is seen that means for Median Household Income and First-term Grade Point Average are essentially identical for the Caucasian and African American students. Although the

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number of black students in this category was small (n=21), those who were high scorers on the SAT came from communities with Median Household Incomes identical to those of the much larger group of white students (n=1,256) who were high scorers; moreover, the observed college achievement (FGPA) of both groups was identical as well. Black students who were high scorers on the SAT had the same level of socio-cultural capital available to them, as measured by Median Household Income, as did whites who were high scorers, and performed equally well in college as measured by First-term Grade point Average. It is likely that the high scoring African American students were able to avail themselves of comparable resources, networks and opportunities as did the Caucasian students.

Insert Table 5 about here

Moreover, as demonstrated by Figure 6, for students who come from communities where median household income is above \$50,000, the achievement gap between blacks and whites is small, and it disappears completely as SAT score increases.

Insert Figure 6 about here

These findings indicate that both High School Grade Point Average and SAT score predict future academic achievement in college at a statistically significant level and that together they do a better job than either does alone, consistent with prior research (Hills and Gladny, 1968). For white students, both High School Grade Point Average and

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SAT score rather consistently predict achievement with an effect size that can be described as small to moderate (r between .20 and .30). For Black students, there was more variation in the predictive power of either SAT or High School Grade Point Average, but SAT more consistently predicted college achievement with a small to moderate effect size (r between .12 and .37), while High School Grade Point Average was not only more variable as a predictor (in one year it did not rise to significance), but generally weaker as well (r between .03 and .28).

Yet, for both black and white students, the proportion of variance accounted for by High School Grade Point Average and SAT score together was less than 20 percent and begs the question why they do not do a better job of predicting college achievement given that prior grades and test score are so ubiquitous to the college admissions process. One set of answers is related to the selection process itself and the restriction of range that results. Students self-select when applying to a given college for a variety of non-random reasons. Colleges then select from among the applicants those students whose characteristics have a good fit with the college's goals and priorities. As they evaluate student characteristics, it is not uncommon for admissions officers to pit one variable against another or to give extra weight to such non-cognitive variables as quality of high school, leadership or perceived motivation, with a result that the predictive power of such variables as high school grades or test scores is diminished (Dawes, 1975). For example, high grades might be used to offset low test scores (and vice versa); work or leadership experiences might serve to the advantage of a students with high test scores, but relatively modest high school grades. Furthermore, only some of the students admitted actually enroll at a given college while others enroll elsewhere and for a variety of

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reasons (e.g., availability of financial aid or distance from home). Validity studies can only be done on those students who actually attend the institution and these students tend to be selected from the upper end of test scorers as well as having idiosyncratic reasons for deciding to attend a given institution.

Another set of answers to the prediction problem lies in the complexity of the criterion. Although, High School Grade Point Average and test score may serve as reliable measures of talent and as such form the base for college achievement, talent alone is not sufficient for success in the selective college. A variety of others factors are also at work and many of them have to do with adjusting to different or novel circumstances: e.g., adjusting to a roommate, managing independence, dealing with interpersonal relationships and social demands, or meeting higher standards of achievement in comparison to high school. And these are representative only of those issues within the student's control. Other factors are beyond the student's control: family strife (e.g., divorce or death); financial resources, which can be affected by family change and by the state of the economy generally; or something as simple as a noisy residence hall are some examples. The impact on achievement of such personal traits as conscientiousness, motivation, or determination are widely known and accepted (Gheseilli, 1963; Levine, 1976; Dweck, 1986). But in a given semester numerous situationally specific factors can influence achievement as well: a key course might be taught by an experienced professor (whose prior exams are readily available for perusal on fraternity row) or by a new professor with different ideas about the subject matter. In the final analysis, academic achievement is the end product of the complex behaviors that

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allow students to cope with this variety of factors, all of which occur *after* high school and *after* having taken admissions tests.

Therefore, perhaps the biggest reason academic achievement is not more predictable is simply the fact that many of the things that influence it occur only after the student has entered college and not before. That is, achievement is influenced by the level of competition unique to any class or to the grading philosophy of the professor teaching the class or the professor's knowledge and skill as a teacher (e.g., is the teacher a new assistant professor, tenured professor, or professor emeritus). Achievement is influenced by the climate on the campus: is it open and supportive or perceived to be closed, clique-ish or even hostile by certain students? Was there a tragedy on the campus (auto accident, drowning, suicide)? If so, how did the campus community respond? In the interpersonal realm, did the student have relationships that were mutually supportive, co-dependent, dysfunctional, or abusive? This rather lengthy list is by no means exhaustive of the many things that students may encounter while at college and which conceivably may influence their particular experience and subsequent academic achievement. Although it may be possible to quantify many of these factors, and even to do a retrospective analysis of their influence, for purposes of predicting college grades it would be meaningless to do so because they occur only after students have enrolled in the college of their choice.

In sum, college achievement has been found to be only about 50 percent predictable (Dawes, 1975; Green, 1981); the variety of factors listed above indicate why that might be the case. However, the fact that many factors impact college achievement does not mean that prior grades or admissions test scores are of no value; clearly they are valuable and significant predictors of achievement for all groups as supported by findings

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reported here. What may be more important is that we understand both the value and the limitations that such measures provide. We should be careful not to reify either grades or test scores, which inevitably serves to diminish the contribution to be made by other variables influential to college achievement.

Much of the long-standing concern about standardized tests is actually concern about the potential for test bias and has to do with the performance of minorities, particularly black students whose mean scores on such tests are about one standard deviation below those of whites (Cleary, 1968; Darlington, 1971; Temp, 1971; Linn and Werts, 1971; Samuda, 1975; Jenifer, 1984; Cruise and Trusheim, 1988; Hauser, 1988; Suzuki and Valencia, 1997). This has led some to call for the end of standardized testing, charges that tests are biased against minorities, or rendering the submission of test scores optional for college applicants. Related criticisms were summarized by Atkinson (2001), including concern that test scores are overemphasized, that they move education in undesirable directions (teaching to the test), or that the tests appear to be unfair because the wealthy can afford coaching programs while the poor and minorities remain uninformed of what they can do to improve their performance. Findings presented here indicate that a substantial portion of the black-white test score gap can be attributed to differences in the socio-cultural capital available to black and to white students as well. The impact of differences in socio-cultural capital extends far beyond standardized test scores and must be seen to encompass related factors that precede college enrollment, including the quality of schooling and other opportunities for intellectual growth that guide successful college academic achievement.

References

Adelman, C. (1999) Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment. Washington, DC: U. S. Department of Education, Office of Educational Research and Improvement.

Astin, A. (1971), Predicting Academic Performance in College. New York: Free Press.

Astin, A. (1993) What Matters in College: Four Critical Years Revisited. San Francisco: Jossey-Bass.

Atkinson, R. C. (2001) Standardized Tests and Access to American Universities. The 2001 Robert H. Atwell Distinguished Lecture, delivered at the 83rd Annual Meeting of the American Council on Education, Washington, DC: February 18, 2001.

Belliveau, M.A., Oreilly, C.A., and Wade, J.B. (1996) Social Capital at the Top: Effects of Social Similarity and Status on CEO Compensation. *Academy of Management Journal*, vol. 39, no. 6, 1568-1593.

Bowen, W. G. and Bok, D. (1998) The Shape of the River: Long Term Consequences of Considering Race in College and University Admissions. Princeton, NJ: Princeton University Press.

Bowers, J. (1970) The comparison of GPA regression equations for regularly admitted and disadvantaged freshmen at the University of Illinois. Journal of Educational Measurement, 7, 219-225.

Burt, R. S. (1999) The Contingent Value of Social Capital. *Annual Review of Sociology*, 25, 467-487.

Black-White Test Score Gap & Academic Achievement

Camara, W. & Echtenracht, G. (2000) The SAT-I and high school grades: Utility in predicting success in college. (College Board Report No. RN-10). New York: College Entrance Examination Board.

Carnevale, A. P. and Rose, S. J. (2003) Socioeconomic status, Race/Ethnicity, and Selective College Admissions. New York: The Century Foundation.

Carroll, G.R. and Teo, A. C., (1996) On the Social Networks of Managers. *Academy of Management Journal*, vol. 39, no. 2, 421-440.

Cleary, T. A. (1968) Test bias: Prediction of grades of Negro and White students in integrated colleges. *Journal of Educational Measurement*, 5, 115-124.

Cleary, T. A., Humphreys, L. G., Kendrick, S. A., Wesman, A. (1975) Educational Uses of Tests with Disadvantaged Students. *American Psychologist*, v. 30, no.1, January, 1975, p 15-41.

Cohen, J. (1988) *Statistical Power analysis for the Behavioral Sciences* (2nd Edition). Hillsdale, NJ: Lawrence Erlbaum, Associates.

Cole, N. S. (1973) Bias in Selection. *Journal of Educational Measurement*, v. 10, 237-255.

Cole, N. S. (1999) Merit and Opportunity: Testing and Higher Education at the Vortex. In Nettles, A. L. and Nettles, M. T. (Eds) (1999) *Measuring Up: Challenges Minorities Face in Educational Assessment*. Boston: Kluwer Academic Publishers.

Conley, D. (2000) *Honky*. Berkeley, CA: University of California Press.

Cronbach, L. J. (1975) Five Decades of Public Controversy Over Mental Testing. *American Psychologist*, v. 30, no. 1, January, 1975, p 1-14.

Black-White Test Score Gap & Academic Achievement

Cruise, J. and Trushheim, D. (1988) The Case against the SAT. Chicago and London: The University of Chicago Press.

Darling-Hammond, L. "The Role of Teacher Expectations and Experiences in Students' Opportunity to Learn." In Strategies for Linking School Finances and Students' Opportunity to Learn. Washington, DC: National Governor's Association.

Darlington, R. B. (1971) Another look at "Cultural Fairness. Journal of Educational Measurement, 8, 71-82.

Dawes, R. (1975) Graduate Admissions Variables and Future Success. Science, 28 February 1975, v. 187, Issue 4178, pp. 721-723

Domino, G. (2000) Psychological Testing. Prentice Hall, Upper Saddle River, NJ

Dorans, N. J., Lyu, C.F., Pommerich, M. & Houston, W. M. (1997). Concordance between ACT Assessment and re-centered SAT I Sum scores. College and University, 73 (2), 24-35.

Dweck, C. (1986) Motivational Processes Affecting Learning. American Psychologist, v. 41, p. 1040

Education Trust (1996) Education Watch: The 1996 Education Trust State and National Data Book. Washington DC: The Education Trust.

Feld, S. and Carter, W. (1998) When Desegregation Reduces Interracial Contact. American Journal of Sociology, 103(5), 1165-86.

Feldman, K. A. and Newcomb, T. M. (1969) The Impact of College on Students. San Francisco: Jossey –Bass.

Black-White Test Score Gap & Academic Achievement

Geiser, S. & Studley, R. (2001) UC and the SAT: Predictive Validity and Differential Impact of the SAT I and SAT II at the University of California. University of California, Office of the President.

Ghesilli, E. E. (1963) Moderating effects and differential reliability and validity. *J of Applied Psych*, 47, 81-86.

Gray, W. H., Nettles, M., Perna, L., Edelin, K. (1999) The Case for Affirmative Action. Nettles, A. L. and Nettles, M. T. (Eds.) (1999) *Measuring Up: Challenges Minorities Face in Educational Assessment*. Boston: Kluwer Academic Publishers.

Green, B. F. (1981) A Primer on Testing. *American Psychologist*, 36, (10), 1001-1011.

Haney, W. (1993) "Testing and Minorities." In L. Weis and M. Fine (Eds.) *Beyond Silenced Voices: Class, Race and Gender in United States Schools*. Albany, NY: State University of New York.

Hainfan, L. J., (1916) The Rural School Community Center. *Annals of the Academy of Political and Social Science*, 67, 130-138.

Hauser, R. M. (1998) Trends in Black -White Test Score Differentials: I. Uses and Misuses of NAEP/SAT Data. In U. Neisser (Ed.) *The Rising Curve: Long Term Gains in IQ and Related Measures*. Washington, DC: American Psychological Association.

Helms, J. E. (1992) Why is there no study of cultural equivalence in standardized cognitive ability testing? *American Psychologist*, vol. 47, no. 9, 1083-1101.

Herrnstein, R. J. & Murray, C. (1994) *The Bell Curve: Intelligence and Class in American Life*. New York: The Free Press

Black-White Test Score Gap & Academic Achievement

Hewer, V. H. (1965) Are tests fair to college students from homes with low SES? *Personnel and Guidance Journal*, 43, 764-769.

Hills, John (1971) *Use of Measurement in Selection and Placement*. In R. L. Thorndike, (Ed.), *Educational Measurement, 2nd Edition*. Washington, DC: American Council on Education.

Hills, J., & Gladney, M. B. (1968) Factors influencing grading standards. *Journal of Educational Measurement*, v 5, no. 2, p 31-40.

Holland, J. L. (1963) Explorations of a theory of vocational choice and achievement: II. A four-year prediction study. *Psychological Reports* 42:336-342

Jenifer, F.G. (1984) How tests results affect college admissions of Minorities.” In C. W. Daves, (Ed.) *The Uses and Misuses of Tests*. San Francisco: Jossey-Bass.

Jencks, C. and Phillips, M. (Eds.) (1998) *The Black-White Test Score Gap*. Washington, DC: Brookings Institution Press.

Kane, T. J. (1998) Racial and Ethnic Preferences in College Admissions. In C. Jencks & M Phillips, (Eds.) *The Black-White Test Score Gap*. Washington, DC: The Brookings Institution Press.

Kulik, C., Kulik, J., and Schwalb, B. (1983) College programs for high-risk students: A meta-analysis of findings. *Review of Educational Research*, 53, 397-414.

Lemann, Nicholas (1999) *The Big Test*. New York: Farrar, Straus, Giroux.

Levine, M. (1976) The Academic Achievement Test: Its Historical Context and Social Function. *American Psychologist*, v. 31, no.3, 228-238.

Linn, R. L. (1982) Admissions Testing on Trial. *American Psychologist*, v. 37, no. 3, 279-291.

Black-White Test Score Gap & Academic Achievement

Linn, R. L. and Werts, C. E. (1971) Considerations for studies of test bias. *Journal of Educational Measurement*, 8, 1-4.

Loury, G. (1997) Dynamic Theory of Racial Income Differences. In P. A. Wallace and A. Lemond (Eds.) Women, Minorities and Employment Discrimination. Lexington, MA: Lexington Books.

McCornack, R. L. (1983) Bias in the validity of predicted college grades in four ethnic minority groups. *Educational and Psychological Measurement*, v 43 (2), 517-522.

McNemar, Q. (1975) On So-Called Test Bias. *American Psychologist*, v. 30, no. 8, 848-852.

Millman, M. (1991) Warm Hearts and Cold Cash: The Intimate Dynamics of Family and Money. New York, The Free Press

Nettles, M. T., Theony, A. R., Gosman, E. J., and Dandridge, B. A. (1997) The Causes and Consequences of College Students' Performance: A Focus on Black and White Students' Attrition Rates, Progression Rates and Grade Point Averages. The Tennessee Higher Education Commission.

Nettles, A. L. and Nettles, M. T. (1999) Measuring Up: Challenges Minorities Face in Educational Assessment. Boston: Kluwer Academic Publishers.

Oakes, J. (1990) Multiple Inequalities: The Effects of Race, Social Class and Tracking on Opportunity to Learn Math and Science. Chicago: Rand.

Pascarella, E. T. and Terenzini, P. T. (1991) How College Affects Students. San Francisco: Jossey-Bass:

Putnam, R. D. (2000) Bowling Alone: The Collapse and Revival of American Community. New York: Simon and Shuster.

Black-White Test Score Gap & Academic Achievement

Ravitch, D. (1983) The Uses and Misuses of Tests. *The College Board Review*, no. 130, Winter 1983-84, 22-26.

Sacks, P. (1999) *Standardized Minds: The High Price of America's Testing Culture and What We Can Do to Change It*. Cambridge, MA: Perseus Publishing.

Samuda, R. J. (1975) Testing of American Minorities: Issues and Consequences. New York: Dodd, Mead, & Co.

Stanley, J. C. (1971) Predicting College Success of the Educationally Disadvantaged. *Science*, 171, 640-647.

Suzuki, L. A. and Valencia, R. (1997) Race-Ethnicity and Measured Intelligence: Educational Implications. *American Psychologist*, v. 52, no. 10, 1103-1114.

Temp, G. (1971) Validity of the SAT for Blacks and whites. *Journal of Educational Measurement*, 8, 245-251.

Thernstrom, S. & Thernstrom, A. (1997) America in Black and White: One Nation, Indivisible. New York: Simon and Shuster.

Thorndike, R. L. (1971) Concepts of Culture Fairness. *Journal of Educational Measurement*, 8, 63-70.

Tinto, V. (1987) *Leaving college: rethinking the causes and cures of student attrition*. Chicago: University of Chicago Press.

Vars, F. E. & Bowen, W. G. (1998) Scholastic Aptitude Test Scores, Race, and Academic Performance in Selective Colleges and Universities. In C. Jenckes and M. Phillips (Eds.) *The Black-White Test Score Gap*. Washington, DC: Brookings Institute Press.

Black-White Test Score Gap & Academic Achievement

Willingham. W. W. (1998) Validity in College Selection. Princeton, NJ:
Educational Testing Service.

W. J. Wilson (1987) *The Truly Disadvantaged*. Chicago: U Chicago Press.

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Table 1. Means and standards deviations by race.

| | <i>African American Students (n=2,546)</i> | | <i>Caucasian Students(n=19,929)</i> | |
|-----------|--|-----------|---|-----------|
| | M | sd | M | sd |
| HSGPA | 3.38 | .40 | 3.72 | .28 |
| SAT (V+M) | 1019 | 154 | 1206 | 134 |
| HHI* | \$41.6K | \$16.6K | \$61.5K | \$21.2K |
| FGPA | 2.64 | .70 | 3.14 | .56 |

* Median Household Income

Table 2. Correlation coefficients by race with African American students (n=2,486) represented above the diagonal and Caucasian students (n=19,885) represented below the diagonal.

| | HSGPA | SAT | HHI | FGPA |
|-------|---------|--------|----------|--------|
| HSGPA | | .273** | -.006 ns | .248** |
| SAT | .281** | | .245** | .312** |
| HHI | -.135** | .020** | | .165** |
| FGPA | .324** | .296** | .070** | |

** $p < .01$

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Table 3. Regression Model Summary by Race

White Students

(n=19,893)

| | <i>B</i> | <i>t</i> | <i>sig.</i> | | |
|--------------------|-----------------------------|-------------------|----------------|--------------------------|--|
| HSGPA | .265 | 38.4 | <.001 | | |
| SAT | .231 | 33.5 | <.001 | | |
| HHI | .101 | 15.3 | <.001 | | |
| Gender (female) | .074 | 11.1 | <.001 | | |
| R = .408 | R² = .166 | s.e. = .51 | F=991.2 | df = 4 and 19,889 | |

Black Students

(n=2,542)

| | <i>B</i> | <i>t</i> | <i>sig.</i> | | |
|--------------------|-----------------------------|-------------------|------------------|-------------------------|--|
| HSGPA | .172 | 8.8 | <.001 | | |
| SAT | .248 | 12.3 | <.001 | | |
| HHI | .107 | 5.6 | <.001 | | |
| Gender (female) | .075 | 3.99 | <.001 | | |
| R = .378 | R² = .143 | s.e. = .65 | F = 105.8 | df = 4 and 2,537 | |

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Table 4. Partial correlation for SAT-Total and Median Household Income (HHI) controlling for High School Grade Point Average (HSGPA) by race.

$r(\text{SAT})(\text{HHI}).(\text{HSGPA})$

Caucasian students: $r = .061 *$

African American students: $r = .254^{**}$

Table 5. Means and standard deviations for academic achievement and Median Household Income for students scoring above 1400 on the SAT (V+M) by race.

| | <u>African American Students (n=21)</u> | | <u>Caucasian Students (n=1,256)</u> | |
|-------------------------|--|-------------|--|-------------|
| | <u>Mean</u> | <u>s.d.</u> | <u>Mean</u> | <u>s.d.</u> |
| Median Household Income | \$61.6K | \$25.5K | \$62.1K | \$21.7K |
| HSGPA | 3.75 | .41 | 3.84 | .22 |
| FGPA | 3.53 | .62 | 3.48 | .53 |

Figure 1: Bar graph of B coefficients of predictor variables for Caucasian students by year.

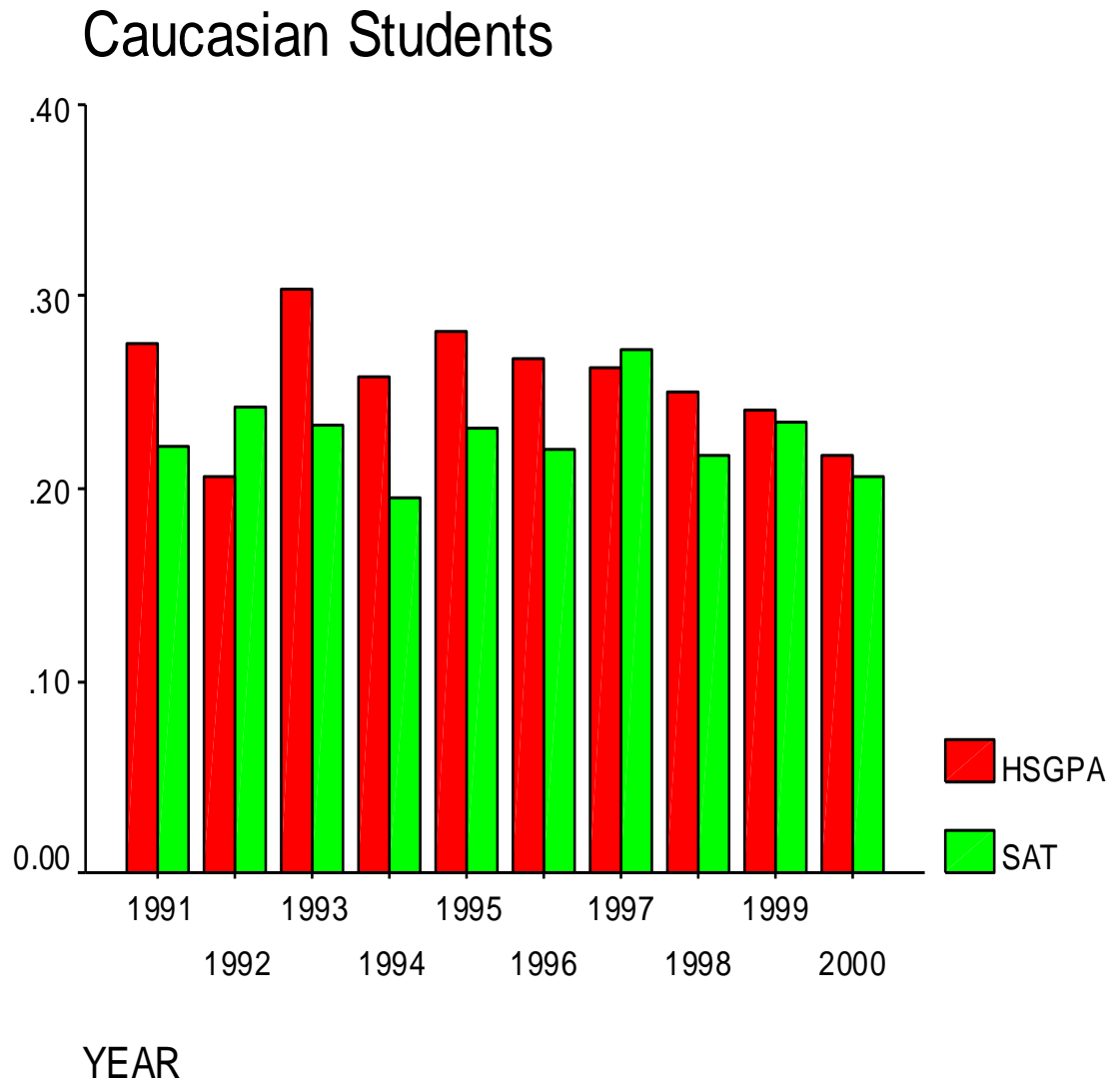
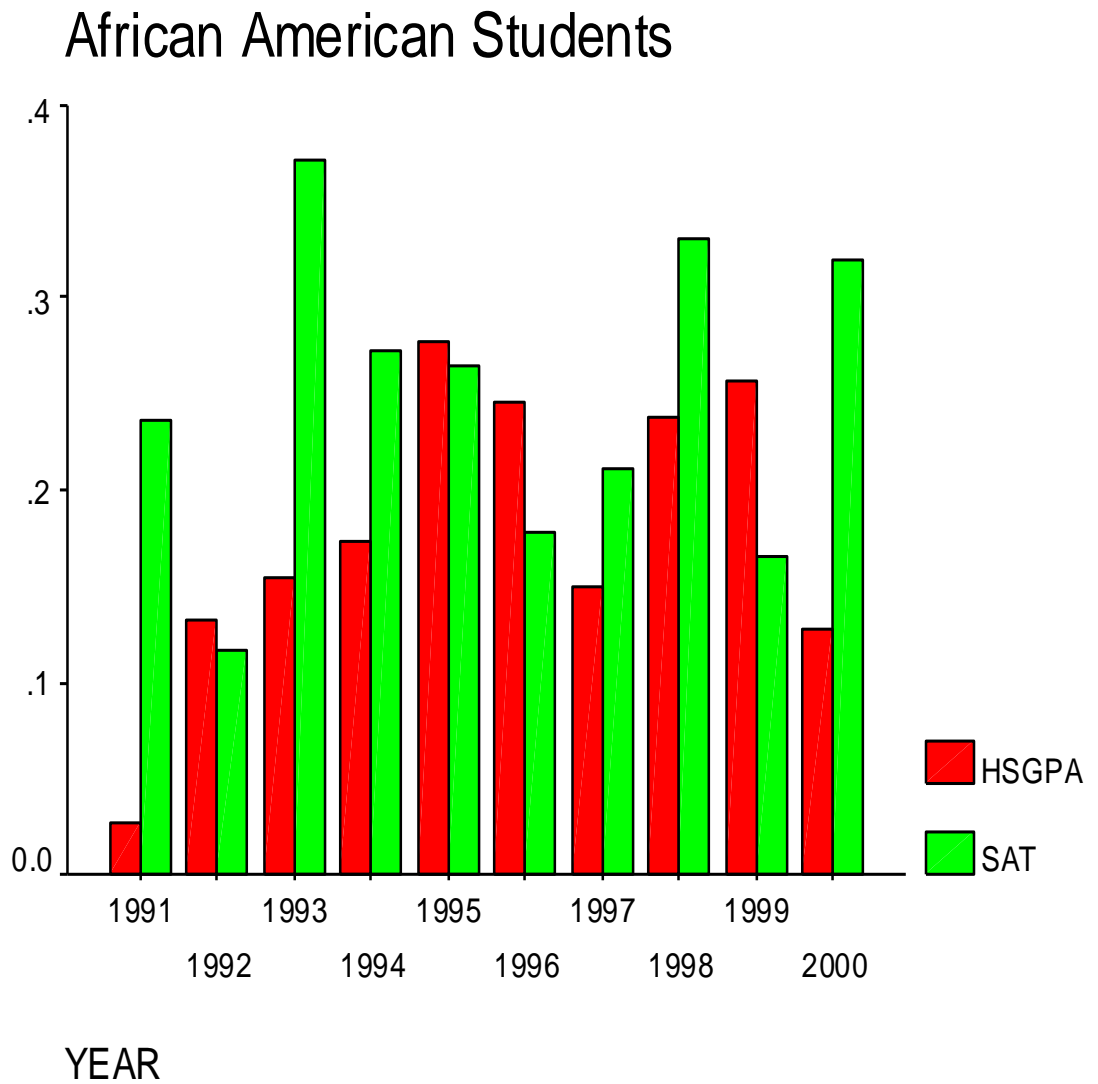


Figure 2: Bar graph of B coefficients of predictor variables for African American students by year.



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Figure 3: Bar graph of Mean SAT-Total (Verbal + Math) scores by race and year.

Mean Test Score by Race

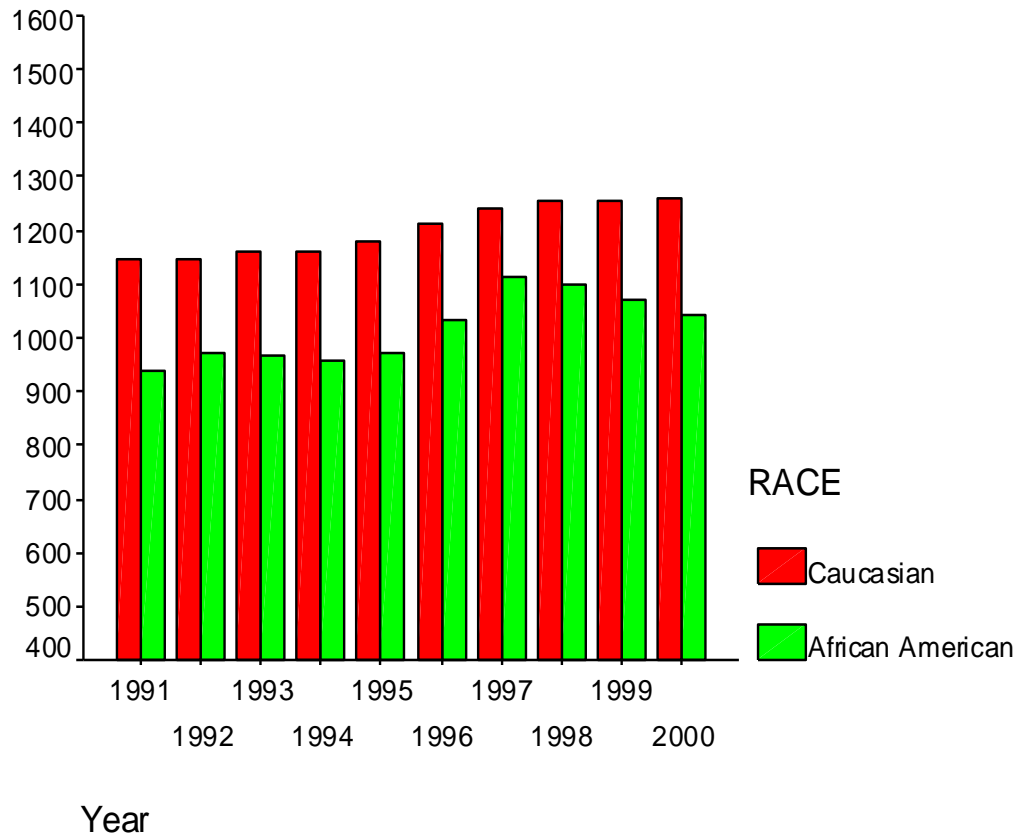


Figure 4: Bar graph of High School Grade Point Average (HSGPA) by race and year.

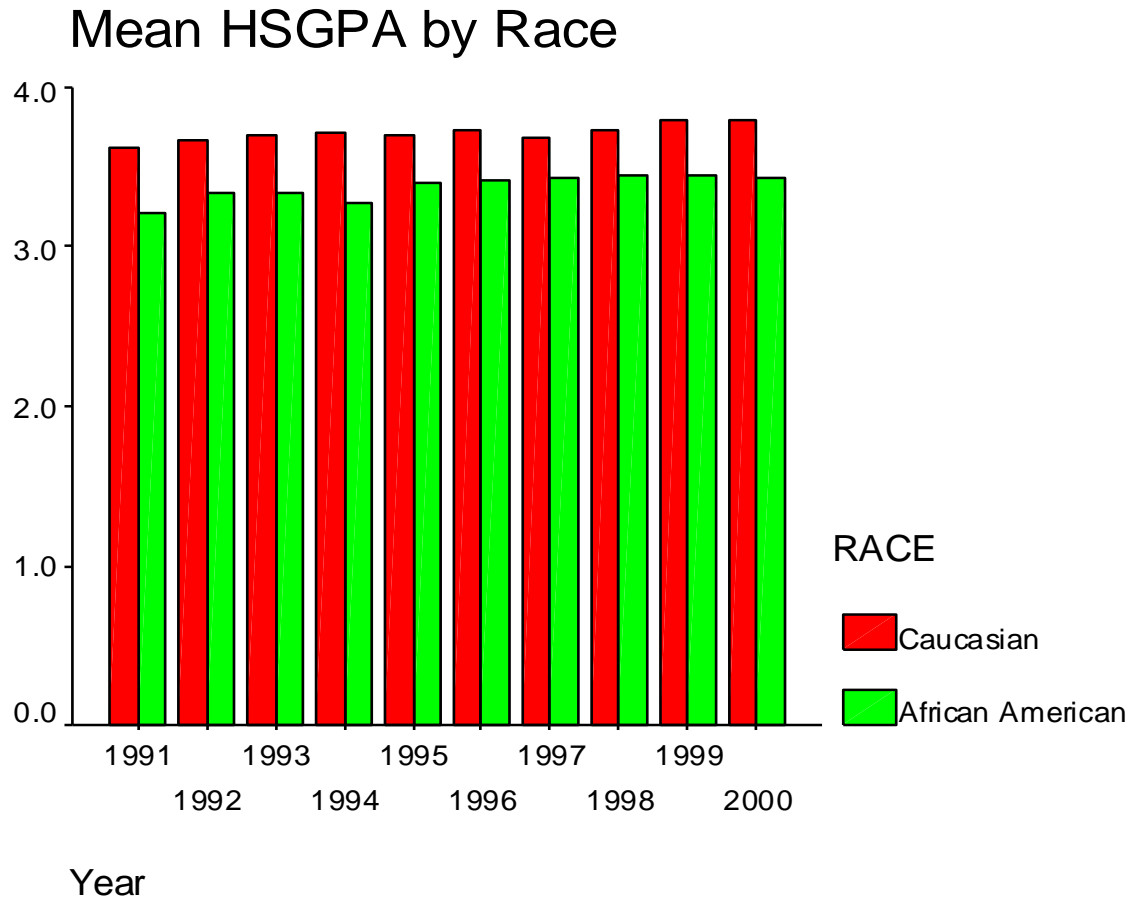


Figure 5: Annual median income by occupational category (1999 dollars in 000s).

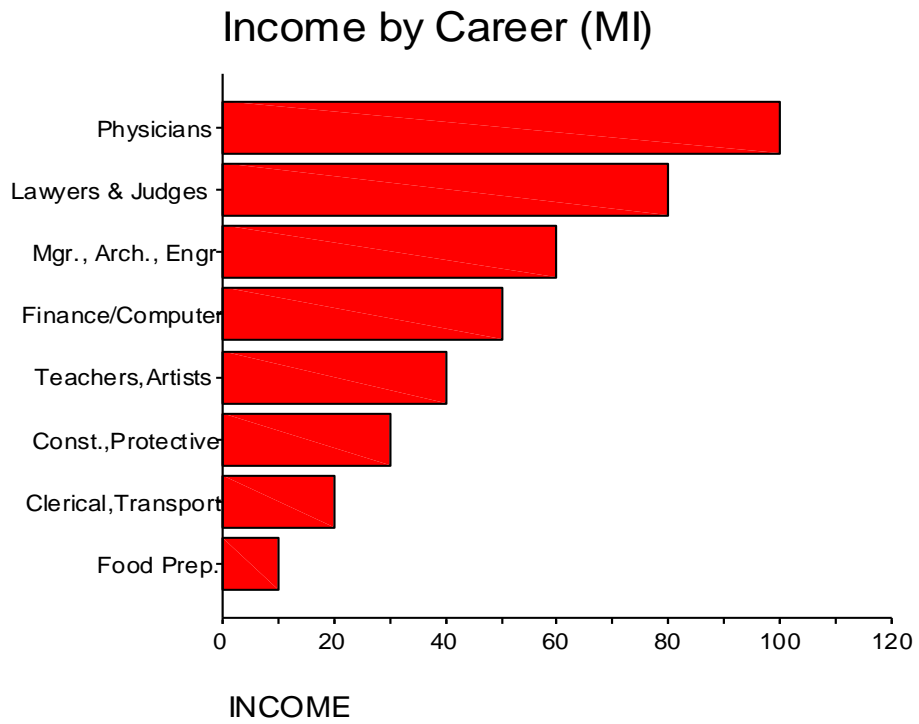


Figure 6: Regression of First-term Grade Point Average (FGPA) on SAT for students from communities with Median Household Incomes (HHI) greater than \$50K per year (in 1999 dollars).

Regression of FGPA on SAT

for HHI > \$50K

