DIFFERENCES IN COLLEGE ACCESS AND CHOICE AMONG RACIAL/ETHNIC GROUPS: Identifying Continuing Barriers

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This study focuses on the college application behaviors of students from various racial/ethnic groups in order to understand differences in access and college choice. Student characteristics, predispositions, academic abilities, and income levels were taken into account in our analyses. We analyzed data from the National Education Longitudinal Study (NELS) and the Beginning Postsecondary Student Longitudinal Study (BPS) and found significant group differences in preparation behaviors, college application behavior (number of colleges to which students applied), and attendance at their first choice of institution. The results of this study call attention to the need for campuses to evaluate the potential effects of policy decisions that may impact student choice for different populations of students.

Access and equity have long been central goals of American higher education, as reflections of both egalitarian and pragmatic interests. There is fairly wide agreement that throughout the 1960s and 1970s, men and women of all racial/ethnic groups achieved ever increasing levels of representation at American two- and four-year institutions, and that college participation rates have increased substantially to the point of eliminating disparities between gender groups in college access (Alexander, Pallas, and Holupka, 1987; Orfield, 1990; Paul, 1990). There is deep disagreement, however, over whether historically underrepresented racial and ethnic groups and those of lower socioeconomic status have gained or lost ground since the 1980s. Alexander et al. (1987) found that for a cohort of 1980 high school seniors, within individual socioeconomic status (SES) levels, minority youth consistently showed higher participation rates than white students. Overall, low family SES was nonetheless strongly

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associated with less college participation. Paul (1990) cites the failure of some researchers to take into account the increasing number of minority high school graduates when they claim advances in higher education representation of minorities. Instead, she contends that when minority enrollment in higher education is considered as a percentage of minority high school graduates, both African Americans and Latinos lost considerable ground between the mid-1970s and the mid-1980s. These differing points of view suggest that it is time to reexamine the progress and barriers to progress in terms of access to higher education in the 1990s.

Changing policies in higher education in the last decade make it particularly appropriate to reexamine college access today with regard to the participation of various racial/ethnic groups. These changes have included rising standards for high school achievement accompanied by more stringent admissions requirements for four-year institutions (Orfield, 1990), increasing reliance on student loans coupled with soaring tuition costs (Orfield, 1992; St. John and Noell, 1989), as well as sharp cuts in the budgets of secondary and postsecondary systems in urban areas (Orfield, 1992). More recently, actions to prohibit consideration of race/ethnicity as a criterion in college admissions suggest a politically based sentiment that such programs and policies are either no longer necessary or that they provide an unfair advantage to students of color over white applicants to college (Hurtado and Navia, 1996). These events raise concerns among many who feel that, just as more jobs will require a postsecondary education, we may be closing the doors to the advanced training of the increasing numbers of women and racial/ethnic minorities who will constitute the U.S. labor force. For these reasons, we examined students' predispositions and college application behaviors as indicators of access, college choice, and educational opportunity.

THEORY AND RESEARCH

Using the theoretical model established by Hossler and Gallagher (1987), we investigated the college application behaviors of various racial/ethnic groups in order to understand differences in the college search and choice processes. Basing their work on models proposed by Jackson (1982) and Litton (1982), Hossler and Gallagher proposed a comprehensive model of college choice. They posit three phases of the college choice process—the predisposition, search, and choice phases—where students' backgrounds, attributes, activities, and institutional characteristics interact to influence the decision-making process.

The first stage is the predisposition phase when family background, ability, and students' early preferences predispose students to aspire to specific degree attainments and seek information about colleges. During the search phase, both the student and institutions engage in search activities. While students seek

information about and make decisions concerning the types of institutions they will consider applying to, institutions typically also provide information to students they are interested in recruiting. In this phase, students narrow the range of schools they are considering to a choice set, "the group of institutions to which students will actually apply" (p. 209). A student's choice set may contain one college or several colleges. In the third and last phase of the college choice process, students evaluate their choices and develop a ranking of first and second choice institutions. Research has shown that factors such as students' perception of quality, large amounts of aid and net cost, as well as college courtship procedures (personalized communication and campus visits), may make a difference between a first and second choice institution (Hossler and Gallagher, 1987).

Because college pricing, financial aid, and other factors are critical to understanding this process, we examined continuing differences in groups both at the senior year of high school and once in college. Erdman (1983) studied factors that influenced high school seniors' applications to specific colleges and found traditional-age students rank the following factors from most influential to least: academic programs, reputation, location, size, parent recommendation, counselor recommendation, cost, and alumni contact. Erdman concluded that "the reputation of a particular institution in the mind of students, the location of that institution, and its size are powerful forces in the selection process, outweighing other factors examined, including cost" (p. 6). In contrast, other work on nontraditional students (consisting mainly of adult students) suggest that these students are more sensitive to tuition cost than recent high school graduates (Bishop and Van Dyk, 1977). Moreover, recent studies have shown that the typical models for college choice are less effective in predicting nontraditional or delayed-entry students' search and choice processes than they are of traditional-aged students (Bers and Smith, 1987). We examined many of these issues across racial/ethnic groups in order to determine key differences in college application behaviors and choice.

DATA AND ANALYTICAL METHODS

Samples

Because early phases of student application-to-college behavior determine a student's choice set, we utilized the National Education Longitudinal Study (NELS:88/92) to understand aspects of the predisposition and search phases and then analyzed data from the Beginning Postsecondary Student Longitudinal Study (BPS:90/92) to further understand the choice phase to determine the likelihood of attendance at their first choice institutions.

The National Education Longitudinal Study of 1988 (NELS:88/92) was created by the U.S. Department of Education National Center for Education Statis-

tics (NCES) to provide trend data on the transitions students encounter as they progress through their elementary, secondary, and postsecondary education. The NELS consists of over 6,000 variables in surveys of students and their parents, teachers, and school administrators. The first wave of data collection began in 1988 with an 8th-grade cohort, and includes follow-ups in 1990 (students as high school sophomores), 1992 (high school seniors), and 1994 (college sophomores or in the workforce). The third follow-up administered in 1994, which contains variables on college choice outcomes, was not available for release by NCES at the point this study was conducted and therefore was not utilized. Estimated response rates varied by collection wave, but remained consistently around or over 90%. (See Ingels et al., 1995, for additional sampling and response rate information.)

The Beginning Postsecondary Student Longitudinal Study (BPS:90/92) was also instituted by NCES, and follows a subset of students identified as first-time beginning students in the academic year 1989–90 who were included in the National Postsecondary Student Aid Study (NPSAS). The BPS sample consists of approximately 7,900 first-time postsecondary students who were surveyed by a computer-assisted telephone interview (CATI) in 1990 and more than 6,500 of these students were followed up with an additional CATI in 1992. As with the NELS, the estimated response rate to the BPS varies by wave, but NCES technical reports approximate the rate to be about or over 85% for each wave. (See Pratt et al., 1994, for additional sampling and response rate information.)

We chose to use two different data sets because each provided different strengths that contributed to our examination of the college predisposition, search, and choice continuum. Because the NELS data set surveys students from the 8th grade forward, it provides key information on a student's initial thoughts and behaviors regarding postsecondary education, as well as furnishes rich data on students' academic and high school experiences. The BPS, which begins its data collection after a student has entered a postsecondary institution, does not contain several key precollege measures, including college aspirations and measures of ability such as standardized test scores or high school grades. The BPS does, however, supply ample data on the outcomes of students' college choices, including comprehensive information on student use of various types of financial aid.

There were two NELS:88/92 samples selected for this study. The first sample represents students who were present in all three waves of the study. We chose the NCES panel weight (F2PNLWT) for this sample in order to approximate the original 8th-grade sample. The weight was normed by dividing it by the sample mean to both adjust the data for nonresponse bias and to redistribute the sample so that it corrects for exaggerated sample sizes that would affect significance tests due to weighting of the data. Because we chose to include in the regression analysis an ability measure that approximated students' high school

grade point averages in a standardized form, we also relied upon the high school transcript data component of the NELS:88/92. The transcript data were merged with the NELS survey data, and the appropriate panel weight (F2TRP1WT) that adjusts for nonresponse bias, supplied by NCES, was divided by the mean panel weight and applied to the data to correct for exaggerated sample sizes. This process yielded a resulting sample size of approximately 14,283 students. As with the NELS data, we also adjusted the BPS data using the NCES panel weight, which also was normed (BPS92AWT/394.01) before it was applied to the data.

Measures

The measures and their coding schemes employed in the NELS and BPS multivariate analyses are presented in Appendices A-1 and A-2. We constructed two models for our study. The first dependent variable represents the fusion of the latter phase of college search and the early phase of college choice in order to understand students' strategies for college choice, in particular, the number of applications to postsecondary institutions that students submit. This measure is scaled in an interval fashion and excludes those students who did not apply to college. This dependent variable serves as a proxy for students' plans to increase their opportunities and their strategic selection of a college that might meet their preferences. The second dependent variable, used with BPS data, indicates the final phase of college choice, whether or not the student is attending his/her first choice institution. This dependent variable is meaningful for two reasons: (1) it represents those students who were successfully able to gain admittance to the college of their choice; and (2) it has become a controversial issue for affirmative action critics, who charge that white and Asian American students are not gaining admission to the colleges of their choice.

Most analyses were conducted by separate racial/ethnic groups in order to explore differences within populations that may occur in students' access and choice of postsecondary institutions. The race/ethnicity variable chosen for the NELS analysis was derived from a composite variable constructed in the second follow-up wave of the survey. The *NELS Student Component Data File User's Manual* recommends this composite variable as the "best known" indicator of a student's race/ethnicity, since the creators of the data set cross-checked students' reports of their race/ethnicity in this wave with their parents' reports and prior responses from previous waves of the survey. For the BPS sample, a composite race variable was chosen from the first follow-up for similar reasons. (See *Beginning Postsecondary Students Longitudinal Study Second Follow-up Field Test Report, BPS:90/94.*)

Our models follow much of the theoretical work summarized in Hossler and Gallagher's (1987) review of the college choice process. In Hossler and Gal-

lagher (1987), the authors underscore the strong influence a student's socio-demographic characteristics may have on his or her predisposition, search, and choice of college. These characteristics include a student's gender, family income, and father's and mother's highest educational attainment. Thus, these variables were included as background controls for both the NELS and BPS models in our study. In addition, because the BPS includes students of a broad age range, and because previous studies (see, for example, Bers and Smith, 1987) have shown that a student's age has a significant impact upon college choice, for the BPS model, we included age as a control as well.

Hossler, Braxton, and Coopersmith (1989) also cite measures of academic achievement or ability and high school track as significant in outcomes associated with college choice. Our NELS model contains several ability variables, such as SAT composite scores (or SAT-equivalent ACT scores) and standardized high school grade point averages in four New Basics subject areas: English, mathematics, science, and social studies. SAT-equivalent scores were derived from a formula cited in Wainer (1984): SAT converted score = 40(ACT score) + 110. We incorporated four separate tracks in the NELS model as reported from the students' high school transcripts: rigorous academic program, academic program, vocational program, and a blended academic/vocational program (the referent group). As a comparative measure of ability from earlier schooling, we utilized scores from a series of cognitive tests the students completed while in 8th grade. The test battery, developed by the Educational Testing Service (ETS), consisted of 116 items in four sections: reading, mathematics, science, and history/government. (See *NELS:88 Base Year: Student Component Data File User's Manual* for more information on the cognitive tests.)

Unfortunately, less than one-third of the BPS sample reported SAT or ACT scores, and in contrast to the NELS data set, the BPS contains no other measures of ability prior to college entry such as high school grades or class rank. The BPS data set does, however, contain self-reports or self-estimates of one's own ability in a variety of general and specific subject areas. The BPS model, therefore, utilizes self-reports of overall academic ability, math ability, and writing ability.

Additionally, Hossler et al. (1989) describe the importance of college preferences in a student's ultimate choice of postsecondary institution. As a method of data reduction, factor analysis was conducted on the NELS data in order to narrow the number of items related to college choice preferences. Principal axis factoring, using orthogonal rotation, yielded three factors. Factor one describes students who cite the importance of college expenses and financial aid considerations in their choices of colleges. Factor two depicts students who underscore the importance of a college's social environment, including items such as a school's athletic program and ethnic composition, when making their decisions on which college to choose. Factor three suggests the importance in stu-

dents' considerations of the overall reputation of a college, including its graduate and job placement abilities and course offerings.

A similar factor analysis produced two college choice preference scales for the BPS sample: importance of choosing a college close to home and importance of choosing a college with a good reputation. The items that compose the constructed scales and their alpha reliabilities for both the NELS and BPS analyses are shown in Appendix A-3.

Finally, because of the emerging literature on the significance of financial aid and need in college choice considerations (see, for example, St. John, 1992), we included total amounts of loans, scholarships (including grants), and levels of unmet need in our BPS analysis on attendance at a first choice institution.

Analyses

For both the NELS and BPS analyses, chi-square tests of distributions were examined in order to test significant differences in students' college predispositions, choices, and outcomes. In the NELS model, ordinary least squares regression analyses were conducted on separate racial/ethnic groups to study the contribution of various student attributes and characteristics upon the number of postsecondary institutions to which they applied. All variables in the multiple regression analysis were entered in forced-entry method in the following sequence: sociodemographic characteristics, measures of ability, and college choice preferences. In order to ensure a substantial number of cases, for nondemographic independent variables with less than 25% of cases missing, means were substituted within each racial/ethnic group.

In the BPS model, we chose to analyze differences regarding students attending the college of their first choice with a logistic regression method (0 indicates the student is not attending his/her first choice institution, and 1 indicates that the student is attending his/her first choice). Based on the review of literature, we assumed that a student's choice of a college is influenced by the particular student's predisposition characteristics, ability assessments, college choice preferences, financial aid, and number of college applications a student submits. Placing this relationship between the dependent variable and the independent variables into a functional form, it follows that:

$$CHOICE_{ci} = f\left([G_i, A_i, E_i, I_i, AB_i], [R_i, DS_i], [F1_i, F2_i, F3_i], [AN_i], u_i\right) \quad (1)$$

where $CHOICE_{ci} = 1$ if a student attends his/her first choice college, 0 if a student does not attend his/her first choice college. G_i = gender, A_i = age, E_i = parents' educational level, I_i = parental income, AB_i = student ability, R_i = college reputation, DS_i = distance from college, $F1_i$ = total amount of loans received, $F2_i$ = total amount of scholarship received, $F3_i$ = balance

needed to pay tuition, AN_i = number of colleges applied to, u_i = a stochastic error term. For estimation purposes, we write (1) as follows:

$$L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = b_1 + b_2G_i + b_3A_i + \dots + b_{11}AN_i + u_i \qquad (2)$$

This model (2) is a *logit model* in which L represents the log of the *odds ratio*.

Most independent variables are recoded as interval levels for interpretation, except for father's and mother's educational level variables, and college choice preference scales. The race/ethnicity variable was incorporated in the logit model instead of estimating each parameter by racial group as we did in the NELS model because it allows us to compare the net influence of each racial group on the log ratio of the model, controlling for other confounding effects (e.g., family income, self-perceived ability measures), and also allows us to find the relative likelihood that students in the racial/ethnic groups are attending their first choice college.

RESULTS

Because student degree aspirations play an important role in predisposition for college, we examined changing expectations for degree attainment from the 10th to the 12th grade, the typical time when students begin evaluating college opportunities. Using the NELS data set, we show that the majority of students seek some type of postsecondary training. Approximately 90%, or more of some racial/ethnic groups, expect to have at least some college, trade school, or graduate education. However, the chi-square tests on Table 1 show significant racial/ethnic differences in early predispositions for college. At 10th grade, Asian Americans have the highest expectations for degree attainment (almost 42% expect to attend graduate school) and Latinos tend to have the lowest expectations for degree attainment among the four racial/ethnic groups. Approximately 11% of Latinos expect to only finish high school (or less) and 27% expect to attend graduate school. While approximately 10% of African Americans expect to finish high school or less (compared with 8% among white students), for the most part, their expectations for degree attainment are roughly similar with only a slightly higher percentage of white students expecting to complete a college or pursue graduate school. Chi-square tests show significant differences between black and white students at $p = \leq .001$ (not shown here). By 12th grade, when all students have increased their aspirations, we find that these differences between black and white students have diminished somewhat ($p = \leq .05$). Asian Americans continue to report the highest expectations for a graduate education (47%) at 12th grade, with the next highest group being African Americans (35%), white students (32%), and Latinos remaining least likely to aspire to this level of attainment (31%).

TABLE 1. College Predisposition and Choice Characteristics for Students of Varying Racial/Ethnic Groups (percentages) in the NELS Sample

	White/ Caucasian	Black/African American	Hispanic/ Latino	Asian/Pacific American	Chi-Square
How far in school a student thinks s/he will go when asked in 10th grade (N = 13,684)					
High school or less	7.5	9.6	10.7	5.0	$125.21; df = 9; p \leq .001$
Some college or trade school	27.1	29.1	33.8	21.7	
Finish college	35.9	27.8	28.9	31.7	
Graduate school	29.5	33.5	26.5	41.6	
How far in school a student thinks s/he will go when asked in 12th grade (N = 13,684)					
High school or less	6.4	4.9	7.0	2.3	$97.34; df = 9; p \leq .001$
Some college or trade school	25.7	25.6	30.8	17.5	
Finish college	36.5	34.9	31.6	33.4	
Graduate school	31.5	34.6	30.5	46.8	
Type of postsecondary institution student is most likely to attend when asked in 12th grade (N = 13,674)					
4-year institution	61.7	59.3	53.1	75.0	$173.53; df = 9; p \leq .001$
2-year academic community college	17.9	16.7	26.3	15.3	
2-year technical community college	11.6	9.9	13.3	7.2	
Trade school	8.9	14.2	7.3	2.5	

Note: Measures were weighted by the NCES construct F2PNLWT/sample mean to adjust for nonresponse bias and to reflect original sample size. Measures of expectations for educational attainment include students who answered this question on both the 10th- and 12th-grade surveys. Native Americans were excluded from all analyses due to the limited number of cases reported in the NELS sample.

This pattern parallels students' most likely choice of institution type. Specifically, when asked at the end of 12th grade about the type of institution the student is likely to attend, 75% of Asian Americans report they are likely to attend a four-year institution. This percentage is followed by white students at 62%, African Americans at 60%, and Latinos at 53%. If expectations match behaviors, these percentages would indicate an increased demand among all racial/ethnic groups for some type of postsecondary training and increased use of four-year institutions. However, our results show that these expectations are not reflected in students' college choice behaviors.

Expectations for degree attainment and plans for college attendance are partly dependent upon student aptitude and preparation; therefore, we examined the patterns of preparation for college and application behaviors for students who scored in the highest quartile of a four-subject cognitive test administered in the 8th grade. Approximately 39% of the Asian Americans, 32% of the white students, 10% of the Latinos, and 9% of African American 8th graders scored in the highest quartile on the 8th-grade test. Although many students can increase their skills in subsequent years in order to prepare for college, these early high achievers would have the highest probability of attending college based on aptitude. Table 2 reveals significant differences by race/ethnicity with regards to taking the SAT/ACT, and the type of postsecondary institution the student is most likely to attend.

The majority of 12th-grade Asian American students (85%), compared with other high-achieving students, have already taken required tests (particularly the SAT) or plan to take them soon. Similarly, the majority of African American (58%), Latino (68%), and white students (58%) who scored in the highest quartiles during 8th grade are likely to state they have already taken the SAT for college by the end of 12th grade. This suggests that those students who are identified at an early stage as having high scholastic talent may actually receive a good deal of information that can prepare them for college. However, they may be missing an important ticket that could make passage to higher education complete. A fair proportion of the 12th-grade, high-ability African Americans (20%) have either no plans to take the SAT or plan to take it later (20%). Unfortunately, this means that almost 40% of African Americans may be delaying their college entrance or foregoing college opportunities. It is also true that almost 40% of white and 32% of Latino students face similar situations. These behaviors of students judged highest achieving in 8th grade suggest that a considerable number of students may constitute lost talent that could be developed in college. Further longitudinal assessments of these individuals will show how divergent their futures actually become over time.

On a more positive note, it appears that the majority of the high-achieving 8th graders tend to seek admission at four-year institutions. Over 93% of African Americans and 95% of Asian Americans seek admission to such institutions.

TABLE 2. College Choice and Preparation Behaviors for High-Ability Students in NELS Sample of Varying Racial/Ethnic Groups (percentages)

	White/ Caucasian	Black/African American	Hispanic/ Latino	Asian/Pacific American	Chi-Square
Has student taken SAT? (N = 4,399)					
Not thought about it	6.0	2.6	3.6	1.8	173.78; *df* = 9; *p* ≤ .001
No plans to take	32.1	19.5	21.1	12.1	
Yes, already took	57.5	58.0	67.7	85.3	
Yes, plan to take	4.4	19.9	7.5	0.8	
Has student taken the ACT? (N = 4,382)					
Not thought about it	8.3	13.2	8.1	3.8	95.15; *df* = 9; *p* ≤ .001
No plans to take	39.9	50.9	44.2	55.2	
Yes, already took	48.3	27.6	35.0	38.1	
Yes, plan to take	3.5	8.3	12.8	2.8	
Type of postsecondary institution student is most likely to attend (N = 4,217)					
4-year institution	84.8	94.0	85.4	95.5	35.90; *df* = 9; *p* ≤ .001
2-year academic community college	9.0	4.4	12.0	4.1	
2-year technical community college	4.0	1.6	1.7	0.4	
Trade school	2.2	0.0	0.8	0.0	

Note: Measures were weighted by the NCES construct F2PNLWT/sample mean to adjust for nonresponse bias and to reflect original sample size.

In contrast, 15% of the white and 15% of the Latino students report they are most likely to attend a two-year community college or trade school. This suggests that among the students with strong potential, a pool of the talented students actually begin their studies at a community college. However, those students who elect to attend a four-year institution are more likely to complete the baccalaureate degree than those who begin college at two-year institutions (see review in Baker and Vélez, 1996).

Because the number of applications a student submits constitutes the development of a student's choice set (Jackson, 1982), this measure not only indicates whether students have a choice among various types of institutions but it is also indicative of some strategic planning about the college selection process. Table 3 shows the number of applications that all 12th-grade NELS students submit to college by race/ethnicity and family income categories. Results reveal that the number of applications a student submits varies significantly by race/ethnicity, income, and ability level.

Significant differences are observed across groups with regard to application behaviors. More than a third of white students report they had not submitted college applications by the end of 12th grade, compared with 24% of Asian Americans, 45% of African Americans, and a high of 47% among Latinos. Although this does not preclude eventual application to college, as future longitudinal studies can monitor, it does suggest that these students are less likely to benefit from the courtship or recruitment activities directed at students during the college search phase that are geared for those entering college immediately after high school. Results show that 27% of white, 24% of Latino, 19% of Asian American and 17% of African American students apply to only one college. Without statistical controls for ability and income, we find that Asian Americans (18%) are most likely to apply to five or more colleges compared with 9% of white/Caucasian and 7% of African American students, and only 5% of Latinos.

Returning to the high-achieving 8th-grade cohort, it is not surprising to find that a high proportion of these students that follow through on college applications expect to attend four-year institutions, ranging from 94% among African Americans to a low of 85% among Latinos. It is surprising, however, to find (as shown in Table 3) that 28% of Latinos and 19% of African Americans of these students (compared with 10% of the Asians and 16% of white students) had not applied to college by the end of 12th grade. These differences in *when* and *who* applies to college should be monitored in the future to further determine the extent to which students may be delaying college entry or whether these students simply never attend college.

Analyses by income groups also reveal that the majority of students in the lowest income category are either not likely to apply to college in the 12th grade (52%) or are likely to apply to very few schools. Although approximately

TABLE 3. Number of College Applications by Race and Family Income (percentages) in the NELS Sample

	None	1 School	2 to 4 Schools	5 or More Schools	Chi-Square
Race or Ethnicity (N = 14,338)					
White/Caucasian	33.7	26.9	30.8	8.6	300.23; $df = 9$; $p \leq .001$
Black/African American	44.5	17.1	31.1	7.2	
Hispanic/Latino	46.8	24.0	24.7	4.5	
Asian/Pacific American	24.1	19.4	38.3	18.3	
Race or Ethnicity (N = 4,387)					
High-Ability students only[1]					
White/Caucasian	16.4	27.1	40.3	16.3	83.02; $df = 9$; $p \leq .001$
Black/African American	18.5	14.7	50.2	16.4	
Hispanic/Latino	27.6	19.2	34.0	19.2	
Asian/Pacific American	9.0	15.2	42.7	33.1	
Family Income (N = 14,500)					
$14,999 or less	51.7	23.1	22.1	3.1	1,027.97; $df = 9$; $p \leq .001$
$15,000–$34,999	40.7	26.9	28.3	4.1	
$35,000–$49,999	33.7	27.1	32.9	6.3	
$50,000 or more	25.2	23.0	35.0	16.9	

Note: Measures were weighted by the NCES construct F2PNLWT/sample mean to adjust for nonresponse bias and to reflect original sample size.
[1]High-ability students defined as those students who scored in the highest quartile on a 4-subject cognitive test administered in 8th grade.

25% of students in the highest income category had not applied to college by the end of 12th grade, over half of these students apply to two or more schools and are more likely than students in other income categories to apply to five or more schools. In contrast, over half of the students in the lowest income category had not applied to college by the end of 12th grade. This suggests that choice models in higher education may be based on assumptions regarding the behaviors of students from the highest income categories, where students typically have the choice between two or more colleges.

Table 4 reveals the results of the regression analysis predicting the number of college applications that students submit at the end of the 12th grade. These analyses include those students for whom high school grades were available from secondary school transcripts, and an adjusted transcript weight was applied to the data to approximate the original cohort. Those who did not apply to college were excluded from these analyses, which allowed for a more normally distributed dependent variable among the college applicants.[1] In predicting the number of college applications filled out by a student, differing patterns emerge when examining each racial/ethnic group. Our model accounts for between 11% of the variance in the dependent variable for the total sample and the highest proportion of the variance explained among Latino students (22%). The total regression for all groups is shown to indicate significant group differences in application behaviors; however, the separate group regressions will be the focus of our results and discussion as these patterns are distinct for each group. Unstandardized and standardized betas are provided to facilitate discussion across and within groups, but differences in sample sizes prohibit us from making definitive statements about racial differences with coefficients significant at the .05 level in the largest sample (white students). For example, with all statistical controls employed, it appears that white females submit fewer applications than white men. This relationship is significant only in the group with the largest sample size and is not significant in other racial/ethnic groups with smaller sample sizes. Larger sample sizes for each of the racial/ethnic minority groups in the future might also detect significant gender differences, with somewhat differing patterns across groups, but we are not able to make a definitive statement in the current study. For this reason we focus on those results that are highly significant ($p = \leq .01$) in the largest sample and significant findings ($p = \leq .05$) in the groups with smaller samples.

After excluding the large proportion of students who did not submit college applications in the 12th grade and controlling for family background, ability, and college preferences, results show that students of color tend to submit somewhat more applications to college than white students. Significance levels indicate that both African American and Asian American students are likely to submit more applications that other types of students. The general pattern across groups suggests that students in lower income categories are likely to

submit fewer college applications than students whose family income is over $50,000 (the referent category). This pattern is strong and consistent for white and Latino students. Middle-income students in these racial/ethnic groups appear to apply to significantly fewer colleges (indicated by a stronger beta coefficient within each group) than students in the highest income category, controlling for student ability and preferences. This may indicate that the relationship between family income and the college application behaviors is nonlinear. Family income results, in contrast, show distinct patterns among Asian American and African American students. There were no family income differences in the Asian/Pacific American sample, and only black/African American students from the lowest income category (less than $14,999) applied to significantly fewer colleges that African American students in other income categories.

For white students, father's education is a significant predictor of the number of applications individuals will submit. While mother's education is significantly correlated with the number of applications a student submits, this drops to nonsignficance when other controls are employed. However, this relationship between parental education and the number of applications submitted is not significant across the other racial/ethnic groups. This may indicate that while African American and Latino parents may have high aspirations for their children, family income differences play a more significant role than parents' education in determining different strategies for selecting a range of colleges. Since measures of ability are the main predictors of the number of college applications submitted among Asian Americans, it may be that the advice that these families provide is strongly linked with the students' achievement since neither family income nor parental education are significantly associated with strategies for selecting a range of institutions for college application.

As we might expect, measures of ability play a significant role in determining the number of college applications a student submits. Students with higher SAT scores are likely to submit more applications across most racial/ethnic groups and higher high school grade point averages were also important for Asian American students, as indicated by their unique contribution to the variance in the dependent variable. Compared with their counterparts in blended academic/ vocational curricular programs, white and Latino students in a rigorous academic track and participation in the academic track for whites and African American students is positively associated with the number of applications submitted. It is interesting to note that Latinos in vocational programs apply to significantly more colleges (presumably both proprietary and two-year colleges) than students who take a blended academic and vocational program. It may be that these students' vocational training in high school actually encourages them to seek a range of postsecondary choices to meet specialized career goals.

The college choice preferences were also significant determinants of the number of applications submitted by most student groups, with the exception of

TABLE 4. Summary Statistics of Multiple Regression Analysis for Number of College Applications for the NELS Sample[1]

	All Racial/Ethnic Groups (N = 5,214)		White/ Caucasian (N = 4,223)		Black/African American (N = 440)		Hispanic/ Latino (N = 298)		Asian/Pacific American (N = 230)	
	b	β	b	β	b	β	b	β	b	β
Student background characteristics										
Black/African American	.214	.087***								
Hispanic/Latino	.117	.040***								
Asian/Pacific American	.179	.054***								
Native American/American Indian	.382	.033***								
(White/Caucasian)										
Female	−.049	−.036***	−.045	−.033*	−.085	−.064	−.084	−.061	.101	.070
Family income $14,999 or less	−.264	−.108***	−.227	−.073***	−.452	−.314***	−.410	−.268***	−.054	−.023
Family income $15,000–$34,999	−.157	−.106***	−.138	−.093***	−.052	−.037	−.439	−.297***	−.191	−.102
Family income $35,000–$49,999	−.198	−.119***	−.190	−.116***	.097	.055	−.701	−.389***	−.155	−.085
(Family income $50,000 or more)										

Father's education level	.041	.109***	.050	.130***	.005	.011	−.009	−.024	−.003	−.009
Mother's education level	.002	.005	.006	.015	−.014	−.036	−.002	−.005	−.016	−.042
Measures of ability										
SAT composite score²	.677	.181***	.721	.185***	.164	.036	.784	.200**	.649	.191*
High school grade point average	−.019	−.060***	−.026	−.080***	<.001	.003	.007	.021	.104	.284**
Rigorous academic program	.157	.108***	.161	.110***	.053	.039	.257	.179*	.005	.003
Academic program	.171	.125***	.166	.121***	.204	.157*	.143	.106	.112	.077
Vocational program (Blended academic and vocational program)	.178	.027*	.113	.016	−.224	−.036	.747	.186**	−.329	−.015
College choice preferences										
Importance of college expenses and financial aid	−.004	−.008	<−.001	−.001	−.019	−.032	.010	.017	.028	.050
Importance of social atmosphere	.013	.033*	.017	.042**	−.038	−.105*	.012	.030	.046	.110
Importance of reputation of college	.025	.078**	.024	.079***	.021	.058	.065	.213***	−.040	−.110
R-square	.114		.118		.121		.216		.144	

Note: Measures were weighted by the NCES construct F2TRP1WT/sample mean to adjust for nonresponse bias and to reflect original sample size.

*p ≤ .05; **p ≤ .01; ***p ≤ .001

Categories in parentheses are reference groups for each dummy variable.

¹This dependent variable includes only those students in the NELS sample who applied to at least one postsecondary institution.

²Measure includes SAT-equivalent ACT scores.

Asian Americans. White and Latino students concerned with the reputation of their college choice tend to apply to more colleges, although this is not a significant relationship in other groups. It is interesting to note that the importance of the social atmosphere is positively associated with large choice sets among white students but is actually associated with smaller choice sets among African American students. It may be that few schools meet the social preference criteria among African Americans, presumably because of the varying racial climates on college campuses (Hurtado, 1992). Whatever the explanation, the findings indicate distinct strategies among racial/ethnic groups based on preferences. Once family income is controlled among college applicants, students' concerns about finances are not significantly related to the number of applications submitted. Since we only examined college applicants, it remains to be seen whether financial concerns are more important in determining whether a student applies to college or seeks full-time participation in the labor force.

Aside from examining the college application behavior, we examined the results of the college choice process in order to identify racial/ethnic differences. We used the BPS sample and logistic regression to analyze whether students reported they were attending their first choice institution. Given the current affirmative action debate, we were interested in learning whether students of color were actually more likely to be attending their first choice institution than white students, controlling for parental income and perceived ability measures. Table 5 presents the empirical results of the multivariate logit model, which shows the estimated coefficient, standard error, and the t statistics for each of the independent variables. In terms of model fit, overall, 85% of the 5,664 students were correctly classified. Of the students who attend their first choice college, 94% were correctly classified. Of the students who do not attend their first choice college, 47% were correctly classified. The goodness-of-fit statistics show that the model fits the data well, and is also statistically significant ($df = 31$, $\chi^2 = 2320.51$).

A student's gender, family income, mother's and father's education, preferences for college distance, and receipt of aid or level of unmet need were not unique contributors to attending a first choice college. That is, these variables are likely to be characteristic of students who were both disappointed regarding their choice of college and students who were content with their choice. In contrast, applying to fewer colleges was significantly associated with increased log odds of attending his or her first choice college. This reveals that applying to fewer colleges is an indicator that students are sure about their choice, and applying to one college in particular indicates the college was their *first* and *only* choice. Moreover, students who had strong preferences for colleges with good reputations were also more likely to state they were currently attending their first choice institution. Black, Latino, and Asian students show lower log

TABLE 5. Logit Estimate Results for Students' Attendance at Their First Choice
Institutions ($N = 5,666$) in BPS sample

	b Sig	Std. Error	t
Student background characteristics			
Gender			
Female	−.04	.09	−.44
(Male)			
Age			
25 or more	.70*	.31	2.26
20–24	−.47*	.22	−2.14
(19 or less)			
Race/ethnicity			
Black/African American	−.75***	.16	−4.69
Hispanic/Latino	−.18	.21	−.86
Asian/Pacific American	−.10	.21	−.48
Native American/American Indian	−.03	.50	−.06
(White/Caucasian)			
Family income			
$14,999 or less	.01	.16	.06
$15,000–$34,999	.10	.14	.71
$35,000–$49,999	−.01	.13	−.08
($50,000 or more)			
Mothers' education	.03	.02	1.50
Father's education	.01	.02	.50
Self-reports of ability			
Academic ability			
Below average	−.60	.43	−1.40
Average	.09	.10	.90
(Above average)			
Math ability			
Below average	.31*	.15	2.07
Average	.27**	.10	2.70
(Above average)			
Writing ability			
Below average	.16	.21	.76
Average	.19*	.10	1.90
(Above average)			
College choice preferences			
Close to home	−.04	.02	−2.00

TABLE 5. *Continued*

	b Sig	Std. Error	t
Good reputation	.33***	.03	11.00
Number of colleges applied to			
1 school	11.95***	4.63	2.58
2 to 4 schools	.80***	.12	6.67
(5 or more schools)			
Financial aid/Sources of income			
Total amount of loans received			
None	.18	.15	1.20
$1,239 or less	.33	.26	1.27
$1,240–$2,550	.35	.21	1.67
($2,551 or more)			
Total amount of scholarships received			
None	−.08	.14	−.57
$2,008 or less	.05	.15	.33
$2,009–$2,625	.00	.22	.00
($2,626 or more)			
Balance needed to pay tuition			
None	−.08	.15	−.53
$1,917 or less	−.11	.18	−.61
$1,922–$5,250	−.23	.17	−1.35
($5,260 or more)			

Note: Measures were weighted by the NCES construct BPS92AWT/sample mean to adjust for nonresponse bias and to reflect original sample size.

*p ≤ .05; **p ≤ .01; ***p ≤ .001

Categories in parentheses are reference groups for each dummy variable.

Chi-square = 2,320.51; df = 31; p ≤ .01.

odds of attending their first choice colleges, compared to white students. Specifically, black students in our sample were significantly less likely to attend their first choice college, controlling for income and other variables in the equation.

Differences among students who fall in various age and ability categories are evident. For example, nontraditional students aged 25 or older are more likely to report attending a first choice institution than traditional-aged students aged 19 or less, while students aged 20–24 are significantly less likely to report attending their first choice institution than the youngest age group. Students who delay college entry for a few years after high school graduation are somewhat more disappointed in the college opportunities available to them for reasons that are yet to be determined. This suggests that delayed entry students (age 20–24) are a unique group and perhaps cannot be classified with traditional students as they typically are in research and policy. Students who report

they are below average or average in math ability are more likely to report attending their first choice institution than students who rated themselves high in ability. Similarly, students who rated themselves average in writing ability were more likely to state they were attending their first choice institution than students of high writing ability. This indicates that students who consider themselves to have high ability in specific academic areas may apply to some schools that are very competitive for admission, which increases the likelihood that some of their schools may be out of reach.

DISCUSSION

Most of today's secondary school students expect to obtain some type of postsecondary training, and these expectations for educational advancement increase by the time they reach 12th grade. This is a key finding that suggests that students' expectations may be attuned to the increasing number of jobs that will require a postsecondary education (Orfield, 1990). However, we find that such expectations or plans for postsecondary education are not immediately evident in students' college search and choice behaviors. It appears as if students experience continuing barriers on route to higher education. These are revealed through distinct patterns across racial/ethnic groups and variations according to family income levels. These patterns are reviewed here to discuss their implications for research and practice in higher education.

We found that conducting educational research across racial/ethnic groups within the context of inequality becomes quite complex as statistical controls assume in a model that "all things are equal" when, in fact, they are not. It requires an understanding of the populations in question as well as good analytical skills to arrive at reasonable interpretations. For example, controlling for academic ability, college preferences, family income, and education, we found that students of color tend to submit more college applications than white students. This suggests that students of color who successfully proceed through schools (do not drop out), score similarly on college entrance tests, and have comparable socioeconomic backgrounds are more strategic than their white counterparts about the college application process. In reality, only a small number of African American and Latino students meet the criteria of "equality" along these dimensions necessary for college, and being strategic about educational opportunity is perhaps the only way these few students can succeed. Our results primarily showed that large proportions of African American (45%) and Latino students (47%) do not even apply to college during the 12th grade, nor do approximately one-fifth to over one-quarter among these groups (respectively) who were identified as high achievers on 8th-grade cognitive tests.

While the traditional college choice models were useful in conceptualizing

this study, it is becoming clear that it is necessary to develop more precise models of the predisposition phase to understand the vast differences in student preparation for college among various racial/ethnic groups. In many ways our analysis confirms prior research that shows Asian Americans are best prepared for college (Suzuki, 1994) and are likely to enter higher education immediately after high school. They are likely to have high expectations for degree attainment, take required standardized tests on time, and apply to the highest number of colleges. Despite Asian Americans' high application rates, however, they are not significantly more likely than white students to be attending their first choice institution. If students are aware of this fact, it only serves to reinforce the practice of applying to a wide range of schools. Among Asian American college applicants, student ability is the main predictor of being strategic about submitting college applications. This is in contrast to other groups where socioeconomic characteristics (parental income and education) continue to play a direct role in the development of a choice set. We suggest that such socioeconomic characteristics are more strongly tied with achievement among Asian Americans and therefore play an indirect role in the college choice process. Rather than differentiating among college applicants, it may be that such socioeconomic characteristics play a direct role in determining which Asian American students do not attend college immediately after high school. Future research might determine how the early phases of college awareness are developed and whether results hold across Asian Americans with different immigration histories and ethnicities, as some predict that Asian Americans may soon constitute 10% of all students in higher education (Suzuki, 1994).

Despite the growth in college-age Latinos over the last decade, the pattern of college access and choice remains unchanged since the 1970s, when researchers reported that both Latinos and American Indians faced the most difficulty in college access (Astin, 1982). Latino students are least likely to engage in an extensive search and choice process. They have the lowest expectations for degree attainment, are least likely to enroll in college immediately after high school, and tend to apply to fewer colleges than other students. High-achieving Latinos tend to fare much better regarding college choice behaviors, but among the high-achieving groups, they remain least likely to apply to college during high school. This behavior is clearly mirrored in national statistics that indicate approximately 55% of Latinos in college are attending two-year institutions, which is the largest percentage of any racial/ethnic group (Carter and Wilson, 1992). While the community college may be the primary route in higher education for Latinos, it need not become the only choice for college opportunity among the growing numbers of students predicted to become the largest minority in the near future. Further research is needed to identify differences in school and parental socialization contexts that create differences in predisposi-

tion, preparation, college search behaviors, and postsecondary policies that lead to differential college opportunities for Latinos.

African Americans student enrollments have fluctuated over the last 10 years, but like most groups, their participation rate in higher education has increased (Carter and Wilson, 1992). These participation rates are reflected in college choice behaviors. Expectations for degree attainments among African Americans are relatively high, and differences in comparison to white students diminish as they enter the 12th grade. They state that they are likely to attend a four-year college and, among the highest achievers, are about as likely to state this intention as Asian American students. This may be primarily because African Americans have an array of historically black institutions available with a cultural history of utilizing these as important college options. While they rank second only to Latinos in terms of the proportion who had not applied to college at the end of 12th grade, it appears that among college applicants, they are about as likely as white students to apply to several colleges. However, African Americans were significantly less likely than white students to report they were attending their first choice institution in the 1990s. This finding suggests that the current political context that has generated much anti-affirmative action fervor surrounding college admissions occurs irrespective of present-day problems and inequalities in access documented here. Preferences for historically underrepresented groups used in connection with other personal and academic admission criteria have not created unfair advantages, particularly when the numbers of students of color who overcome adversity to reach higher education are so small and access remains a significant problem for particular populations.

While results show that ability measures remain strong determinants of strategically planning students' college options, socioeconomic characteristics continue to influence the choices or opportunities available to students in higher education in terms of the development of their college choice sets. This is particularly true for white students, where both family income and father's education level exert significant influences on the number of college applications a student submits. Researchers have begun to document the innovative strategies high SES parents use to both maximize their child's opportunity to attend a "good college" and develop realistic alternatives (McDonough, 1994). However, neither family income nor the amount of financial aid was significantly associated with attending a first choice institution. We hypothesize that family income plays an indirect role in influencing a student's first choice institution, via the college search process and development of a choice set. Furthermore, it may be that once controls for this process are employed, a student's conception of what constitutes a "first choice" college is relatively similar across income groups. In addition, financial aid may be important in selecting among colleges

for a *final* choice, but not in attending one's first choice college, particularly if the student was either denied admission or could not attend for a variety of other reasons.

In view of reports that the number of college applications submitted by students has risen over the years (McDonough, 1994), it was surprising that a high proportion of students do not apply to college in 12th grade or only consider one college (75% among Latinos to a low of 44% among Asian Americans). This is indicative of a very limited search process on the part of students and a somewhat less successful recruitment process among institutions. College choice models may be based on assumptions regarding the behaviors of students from the highest income categories, where students typically have the choice between two or more colleges. Moreover, when 30–40% of all students deemed high achievers at 8th grade have not applied by the end of grade 12, it suggests that students are either delaying college entry or foregoing college altogether. Consequently we may be experiencing a considerable loss of talent that could be developed in higher education. Therefore, further research into the reasons why students are delaying college and further tests of assumptions that undergird models of college choice are necessary.

Implications for Institutional Research and Policy on Campuses

The results of this study show significant group differences in college application behavior and choice. Increasing the diversity of the student body in terms of racial/ethnic backgrounds and family incomes becomes a more difficult task under conditions of weak affirmative action programs and diminished student financial aid—two of higher education's main redistributive measures aimed at assuring greater college access. While this study was national in scope, there is much important work to be done on individual campuses in evaluating the potential effects of policy decisions that impact student access and choice. As the current state and institutional policies change, institutional research offices will be key in identifying shifts in the student population. Institutions need to continue to monitor the types of students they recruit, college application behaviors, and their positions in students' choice sets. To assist students in meeting their expectations for degree attainment, higher education will need to expand its collaborative activities with K–12 education to better prepare students. The findings here reaffirm the importance of programs geared at early outreach, such as entertaining discussions among 8th graders regarding college attendance and preparation activities. Campuses can take proactive steps to capture some of the lost talent and secure future enrollment projections through the monitoring of these programs to ensure their effectiveness. As policy changes occur, research offices need to stand prepared to project and moni-

tor ill effects that could diminish campus goals for diversity, or potentially diminish their enrollments.

Limitations and Recommendations

Our original intention for this study was to follow a single cohort of students, reviewing predispositions, college search behavior in high school, and the results of the college choice process for those who had moved from high school to college. Although the two national databases allowed us to increase our understanding of key factors in college access and choice among racial/ethnic groups, the NELS third follow-up that revealed the types of institutions students attended was not yet available, making it impossible to conduct all analyses on a single cohort. Instead we elected to conduct a complementary analysis using the BPS because these data provide information about the types of colleges and universities students attended. The BPS, however, contains less detailed information about student predispositions than the NELS. Future research on the applicability of college choice models to specific racial/ethnic groups, and on sources of talent loss in the educational process, will benefit substantially from longitudinal analyses of single cohorts, as numerous studies using the High School and Beyond and the National Longitudinal Study (NLS '72) have shown (Baker and Vélez, 1996). With the release of the NELS third follow-up, research in the next year should extend both the results reported here and previous research on national longitudinal cohorts of students.

A second limitation of this study results from the measures available in the national databases. We were particularly interested in comparing students' academic talents to their opportunities to further develop those talents in higher education. The BPS did not contain adequate measures of precollege academic ability, which is a key factor we wished to control while examining differences in predisposition and choice among groups of students. It contained no measures of high school performance, and some of the racial/ethnic minority groups would have lost too many cases had we relied on the subsample that had taken standardized tests, so we opted to use self-ratings of ability as a proxy in our statistical controls. As with all secondary analyses, we faced similar roadblocks in operationalizing a full college choice model because of the limited constructs available on these data sets. On the other hand, one strength of the BPS is the amount of information it provides on financial aid and unmet need, which may act differentially as determinants of access and persistence for individual racial/ethnic groups. We recommend that in the future the developers of the BPS introduce better measures of academic ability that would permit more rigorous studies of access, transition, and progress in higher education, and of the influence that financial aid has on these important outcomes at college entry and during college.

A third limitation of these national data has to do with the comparisons we would have liked to make in order to provide a full portrait of racial/ethnic differences in this country. Specifically, although oversamples of Asian American and Latino students were conducted in the NELS, no mention of an over-sampling of American Indian/Native Americans was made in the design of the national study. In particular, NELS contains approximately 266 American Indians and the BPS contains approximately 50. The numbers of these students decline markedly as one follows them longitudinally, or attempts to place restrictions (e.g., an in-depth look at high ability or college attenders) in analysis, making it difficult to derive breakdowns that could be statistically reliable. This has been a consistent problem described by researchers for some time now, not to mention the problems in self-identification associated with this group (Oppelt, 1990). We urge better data collection to increase our understanding of issues that affect American Indian access and choice in the future.

NOTE

1. Analyses were also conducted with students who had not submitted college applications, and while our predictors were more effective with this sample in the analyses, the distributions in some groups was so skewed that we were concerned about violations of assumptions. We intend to study those who apply and do not apply to college at the end of 12th grade with appropriate analytic techniques in subsequent work.

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APPENDIX A-1. Coding Scheme of Variables in NELS Analysis

Student background characteristics	
Black/African American	coded 1 = no, 2 = yes
Hispanic/Latino	coded 1 = no, 2 = yes
Asian/Pacific American	coded 1 = no, 2 = yes
Native American/American Indian	coded 1 = no, 2 = yes
Gender	coded 1 = male, 2 = female
Family income $14,999 or less	coded 1 = no, 2 = yes
Family income $15,000–$34,999	coded 1 = no, 2 = yes
Family income $35,000–$49,999	coded 1 = no, 2 = yes
Father's education level	coded in intervals, range: 1 = less than HS diploma to 7 = Ph.D. or professional degree
Mother's education level	coded in intervals, range: 1 = less than HS diploma to 7 = Ph.D. or professional degree
Measures of ability	
SAT composite score	SAT verbal + math score (or ACT equivalent)
High school grade point average	coded in intervals, range: 1 = F to 13 = A+
Rigorous academic program	coded 1 = no, 2 = yes
Academic program	coded 1 = no, 2 = yes
Vocational program	coded 1 = no, 2 = yes
College choice preferences	
Importance of college expenses and financial aid	factor scale, range: 2–6
Importance of social atmosphere	factor scale, range: 5–15
Importance of reputation of college	factor scale, range: 5–15
Dependent variable	
Number of college applications	coded in intervals, range: 1 = none to 3 = 5 or more

APPENDIX A-2. Coding Scheme of Variables in BPS Analysis

Student background characteristics	
Gender	coded 1 = female, 2 = male
Age group	coded in intervals: 1 = 25 or more; 2 = 20–24; 3 = 19 or less
Race	coded 1 = Black; 2 = Latino; 3 = Asian; 4 = Native American; 5 = White
Family income	coded in intervals: 1 = $14,999 or less; 2 = $15,000–$34,999; 3 = $35,000–$49,999; 4 = $50,000 or more
Father's education level	coded in intervals, range: 1 = less than HS diploma to 11 = graduate or professional degree
Mother's education level	coded in intervals, range: 1 = less than HS diploma to 11 = graduate or professional degree
Measures of ability	
Academic ability	coded in intervals: 1 = below average; 2 = average; 3 = above average
Math ability	coded in intervals: 1 = below average; 2 = average; 3 = above average
Writing ability	coded in intervals: 1 = below average; 2 = average; 3 = above average
College choice preferences	
Close to home	factor scale, range: 3–9
Good reputation	factor scale, range: 3–9
Number of colleges applied to	coded 1 = one school; 2 = 2–4 schools; 3 = 5 or more schools
Financial aid/Sources of income	
Total amount of loans received	Any type of loans received in AY 1990–91, coded 1 = none; 2 = $1,239 or less; 3 = $1,240–$2,550; 4 = $2,551 or more
Total amount of scholarships received	Any type of scholarship received in AY 1990–91, coded 1 = none; 2 = $2,008 or less; 3 = $2,009–$2,625; 4 = $2,626 or more
Balance needed to pay tuition	Amount of tuition minus parental contribution minus any type of financial aid, coded 1 = none; 2 = $1,917 or less; 3 = $1,922–$5,250; 4 = $5,260 or more
Dependent variable	
Attending first choice institution	coded 0 = no, 1 = yes

APPENDIX A-3. Factor Scales of College Choice Preferences

Factors and Survey Items	Factor Loading	Internal Consistency (alpha)
NELS Analysis		
Importance of reputation of college		.77
Importance of job placement	.71	
Importance of getting job in chosen degree field	.63	
Importance of reputation of college	.62	
Importance of graduate school placement	.59	
Importance of specific courses	.53	
Importance of social atmosphere		.59
Importance of college athletic program	.50	
Importance of attending same school as parents	.46	
Importance of social life at school	.45	
Importance of ethnic composition at school	.45	
Importance of religious environment	.40	
Importance of college expenses and financial aid		.70
Importance of college expenses	.75	
Importance of financial aid	.64	
BPS Analysis		
College is close to home		.68
Can live at home	.71	
School is close to home	.66	
Can go to school and work	.46	
College has good reputation		.65
College has good reputation	.73	
College has good job placement	.72	
College has good course offerings	.33	

APPENDIX A-4. Descriptive Statistics of Measure in Multiple Regression Analysis by Race/Ethnicity for NELS Sample

	All Racial/Ethnic Groups (N = 5,214)		White/Caucasian (N = 4,223)		Black/African American (N = 440)		Hispanic/Latino (N = 298)		Asian/Pacific American (N = 230)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Student background characteristics										
Black/African American	1.08	0.28								
Hispanic/Latino	1.06	0.23								
Asian/Pacific American	1.04	0.21								
Native American/American Indian	1.00	0.06								
Gender	1.53	0.50	1.53	0.50	1.59	0.49	1.58	0.49	1.45	0.50
Family income $14,999 or less	1.09	0.28	1.05	0.22	1.28	0.45	1.27	0.44	1.11	0.32
Family income $15,000–$34,999	1.30	0.46	1.30	0.46	1.32	0.47	1.29	0.46	1.18	0.39
Family income $35,000–$49,999	1.21	0.41	1.22	0.42	1.16	0.37	1.17	0.38	1.19	0.40
Father's education level	3.88	1.81	3.96	1.77	3.46	1.63	2.78	1.83	4.70	2.04
Mother's education level	3.54	1.68	3.62	1.65	3.23	1.63	2.64	1.69	3.81	1.89
Measures of ability										
SAT composite score[1]	0.95	0.18	0.97	0.18	0.81	0.14	0.84	0.17	1.01	0.21
High school grade point average	8.18	2.10	8.29	2.07	7.08	2.06	7.69	2.02	8.90	1.98

APPENDIX A-4. Continued

	All Racial/Ethnic Groups (N = 5,214)		White/Caucasian (N = 4,223)		Black/African American (N = 440)		Hispanic/Latino (N = 298)		Asian/Pacific American (N = 230)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Rigorous academic program	1.33	0.47	1.32	0.47	1.37	0.48	1.33	0.47	1.39	0.49
Academic program	1.56	0.50	1.57	0.50	1.47	0.50	1.53	0.50	1.58	0.50
Vocational program	1.01	0.10	1.01	0.10	1.01	0.11	1.03	0.17	1.00	0.03
College choice preferences										
Importance of college expenses and financial aid	4.23	1.27	4.12	1.26	5.00	1.12	4.74	1.13	4.08	1.28
Importance of social atmosphere	7.36	1.70	7.25	1.67	8.26	1.79	7.30	1.67	7.57	1.74
Importance of reputation of college	12.50	2.18	12.37	2.21	13.29	1.77	12.75	2.20	12.89	2.00
Dependent variable										
Number of college applications²	1.84	0.68	1.83	0.68	1.90	0.65	1.78	0.68	2.09	0.72

Note: Measures were weighted by the NCES construct F2TRP1WT/sample mean to adjust for nonresponse bias and to reflect original sample size.
¹Measure includes SAT-equivalent ACT scores.
²This dependent variable includes only those students in the NELS who applied to at least one postsecondary institution.

APPENDIX A-5. Descriptive Statistics of Measures in Logistic Regression Analysis for BPS Sample

	Mean	Std. Dev.
Student background characteristics		
Gender (Female)	1.47	0.50
Age	2.56	0.75
Racial/Ethnic group	4.42	1.18
Family income	2.44	1.11
Father's education level	5.34	3.34
Mother's education level	4.82	2.09
Self-ratings of ability		
Academic ability	2.30	0.51
Math ability	2.12	0.65
Writing ability	2.24	0.56
College choice preferences and behavior		
Close to home	6.25	2.09
Good reputation	7.07	1.74
Number of applications	1.47	0.63
Financial resources/need		
Total amount of loans	1.47	1.00
Total amount of scholarships	1.67	1.01
Balance needed to pay tuition	1.98	1.16
Dependent variable		
Attendance at first choice	0.83	0.37

Note: Measures were weighted by the NCES construct BPS92AWT/sample mean to adjust for nonresponse bias and to reflect original sample size. Coding descriptions for the BPS are located in Appendix A-2.