

***ON THE PATH TO COLLEGE:
THREE CRITICAL TASKS FACING AMERICA'S
DISADVANTAGED***

by

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EXECUTIVE SUMMARY

Using data from the National Educational Longitudinal Study of 1988 (NELS:88), this report examines the three tasks that 1988 socioeconomically disadvantaged students must complete on their path to college. Seeking an explanation of the factors enabling poor students to succeed at each task, this report advances a model portraying the path to college as the by-product of academic ability, amount and quality of parental involvement and encouragement, early educational and occupational aspirations, acquisition of college qualifications, and availability of information about college. Some of the main findings are:

Who is a lowest socioeconomic status 8th grader?

- ?? Seventy-seven percent of lowest socioeconomic status (SES) 8th graders have parents with no collegiate experiences. Nearly all of upper-SES 8th graders (99.3%) grew up among parents with some experience of postsecondary education.
- ?? In contrast to better-off socioeconomic status 8th graders, the poorest 8th graders were more prone to be exposed to factors placing them at risk of dropping out from high school. Those at-risk factors included: low grades during junior high school, a history of high school dropouts in the family, being raised by a single parent, being held back a grade, and changing schools more than twice.

What promotes success 'on the path to college'? (Tables 8,9 & 11)

- ?? Enrolling in a four-year institution rests on the completion of at least three critical tasks: a) acquiring at least minimal college qualifications, b) graduating from high school, and c) applying to a four-year college or university. Eighty-one percent of those 8th graders who completed these three tasks enrolled in college by 1994.
- ?? Nearly 54% of all 1988 8th graders secured at least minimal college qualifications by the senior year. Meeting minimal college qualifications was successfully accomplished by 80% of the upper-SES 8th graders. In contrast, only 29% of lowest-SES students completed this task.
- ?? Eighty-eight percent of all 1988 8th graders graduated from high school by 1992. Upper-SES 8th graders' high school graduation rate was 98%. Only 73% of lowest-SES 1988 8th graders secured a high school diploma by 1992.
- ?? By 1994, 36% of all 1988 8th graders enrolled at a 4-year institution. The corresponding college participation rate for high-SES 8th graders was 54%. Only 14.4% of the lowest-SES 1988 8th graders enrolled at a 4-year institution by 1994 (see Figures 1-6).

Acquisition of college qualifications (Table 8)

- ?? Securing college-qualifications correlates with socioeconomic status ($r = .377$).
- ?? In the aggregate, lowest-SES students were 51%, 30% and 17% less likely to secure minimal college qualifications than their highest, middle-upper and middle-lowest SES counterparts.
- ?? Parental involvement, early planning for college and experiencing at risk factors most affect a student's chances to become college qualified.
- ?? The gap between lowest-SES and upper-SES students narrows from 51% to 15% once factors, such as at-risk characteristics and parental involvement, are taken into account.

High School Graduation (Table 9)

- ?? The rate at which 1988 8th graders graduated from their high school correlates with their socioeconomic status ($r=.291$).
- ?? The poorest 1988 8th graders' graduation rate lagged nearly 25% behind that of their upper-SES counterparts.
- ?? Across all students, meeting college-qualifications increased the chances of completing high school by 11.4%. Among the poorest 1988 8th graders, becoming college qualified by the senior year enhanced the chances of completing high school by nearly 26%.
- ?? The gap in graduation rates between lowest-SES and upper-SES students narrows to nearly 8% once college-choice factors, such as college qualifications and early planning, are taken into account.

Applying for College (Table 11)

- ?? College application rates vary in direct relation with socioeconomic status ($r =.414$).
- ?? In the aggregate, the difference in college application rates between the poorest students and upper-SES students is 54%.
- ?? Motivational factors, college qualifications, parental involvement and encouragement, information about financial aid and school-based resources matter the most in increasing the chances of applying for college.
- ?? Controlling for the factors that influence the chance of applying reduced the gap in college application rates between lowest-SES and upper-SES from 54% to nearly 26%.

ACKNOWLEDGMENTS

This report could not have been possible without the generous and fortunate assistance of key organizations and people. We are most indebted to the Association for Institutional Research whose financial support enabled us to systematically examine how lowest-SES 8th graders overcome the three major tasks on their path to college.

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I. Introduction

Three critical tasks on the path to college

On his path to immortality, Hercules faced twelve tasks of increasing difficulty. Each task demanded different skills, strengths and endurance. He managed to overcome each task not only because of his physical and intellectual prowess, but also thanks to the assistance of divine and human intervention at key points. Similar to Hercules' odyssey, college enrollment requires the successful completion of three critical tasks. Each task is completed not only on the merits of the student, but when he or she receives critical support and assistance (e.g. Horn, 1997; Horn & Nuñez, 2000; Chen & Kauffman, 1997; Berkner & Chavez, 1997). The first task is acquiring the necessary academic qualifications for college work. The second is securing a high school diploma, and the third is actually applying and enrolling in a four-year institution of higher education. Our examination of the college choice process experienced by a nationally representative sample of 1988 8th graders confirms that college enrollment is, indeed, a by-product of these three tasks.

When one examines a student's progression through these three critical checkpoints, we find the defining characteristic of the college enrollee is the acquisition of college qualifications¹ that begins as early as the 8th grade (See Figure 1)². Students that secure college qualifications while in high school have a higher chance of enrolling in college than those who did not. Sixty-nine percent of college qualified high school

¹Developed by Berkner and Chavez (1997), the college-qualification index approximates college admissions criteria by collapsing cumulative academic course GPA, senior class rank, aptitude test scores, and the SAT and ACT scores. Adjustments were made to account for the nature of a student's academic program. Berkner and Chavez found just meeting minimal college qualifications significantly predicts college enrollment (see Table III.1 in Appendix III). For the purpose of this report, the college-qualified categories of somewhat qualified, very qualified and highly qualified were collapsed into the category of qualified.

²Figures 1-6 are based on panel weight (F3PNLWT), which estimated the population of 8th graders to be 2,968,427 in 1988 (see Appendix II). Of them, only 89.1% (2,668,022) had valid information in the college-qualification index. Subjects with missing values for high school completion and four-year applications have also been excluded from analysis.

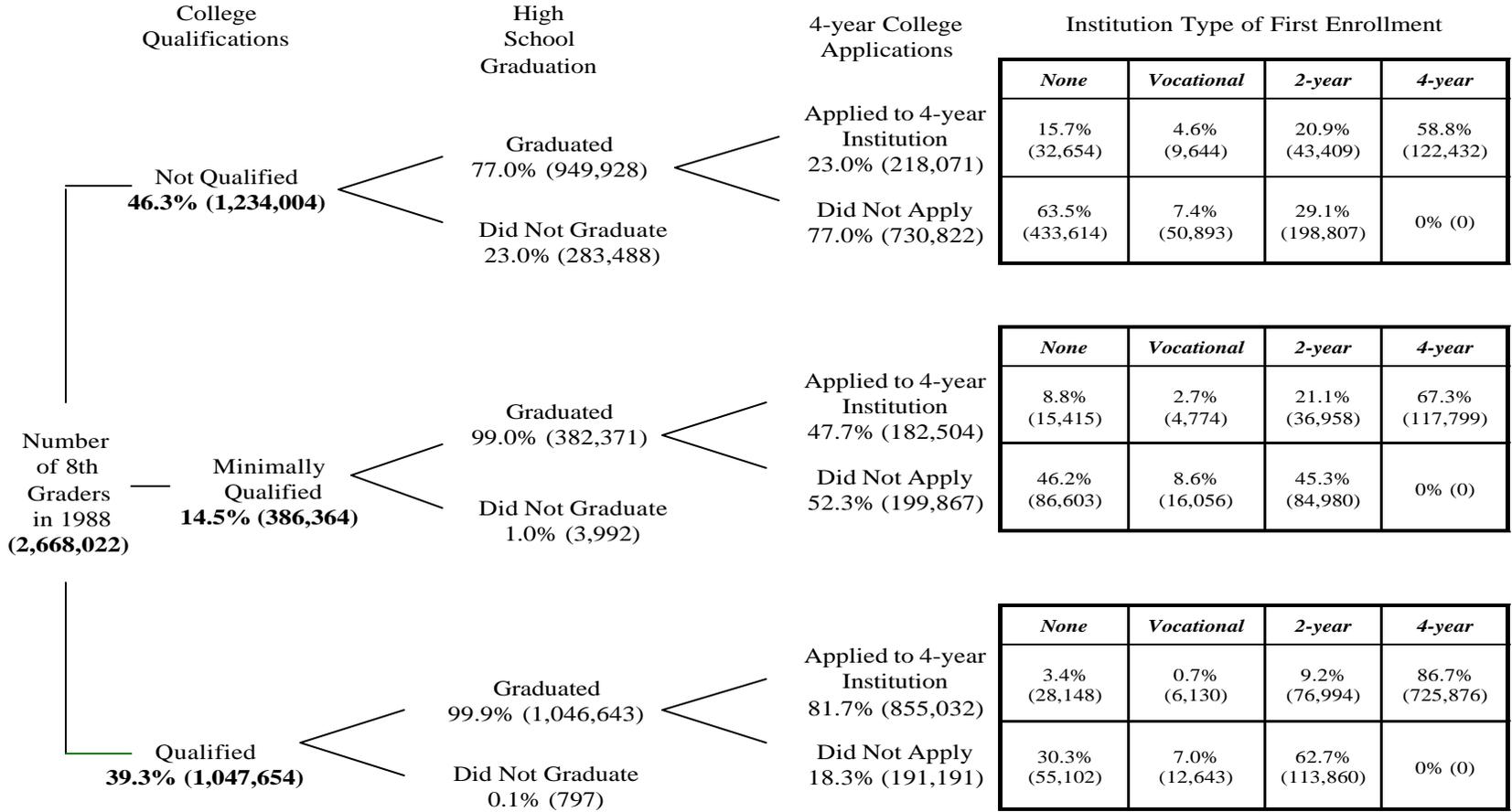
graduates enrolled in a four-year institution³ immediately following high school completion, while only 9.9% of those who did not secure college qualifications enrolled. Even obtaining only a minimum level of college qualifications increased a student's likelihood of enrolling in a 4-year institution. Thirty percent of those 8th graders who secured only minimum college qualifications during high school enrolled in a 4-year institution after graduation.

Figure 1 also shows the importance of securing college qualifications as an important precondition of high school graduation. Nearly all students securing minimal qualifications and above completed high school, whereas only 77% of those students not meeting college qualifications secured a high school diploma.

As important as it is to become college-qualified and obtain a high school diploma to enroll in a 4-year institution, college attendance can only be triggered when the student actually submits college applications. The application process in itself presents numerous hurdles. Those hurdles include concerns over college costs, uncertainties in the selection of major, completion of college applications forms and filling out extremely complex financial aid forms. Even for the most college qualified students, the application process may present intimidating challenges. Eighteen percent of those most qualified students did not apply to a 4-year institution. Regardless of qualifications, if students opt not to apply, they are not eligible to enroll.

³ College enrollment was ascertained using F3SEC2A1, an index developed by Berkner and Chavez tracking first type of institution attended as of 1994. See Table III. 1 in Appendix III.

Figure 1. College Choice Process for 1988 8th Grade Students



Based on National Educational Longitudinal Study 1988

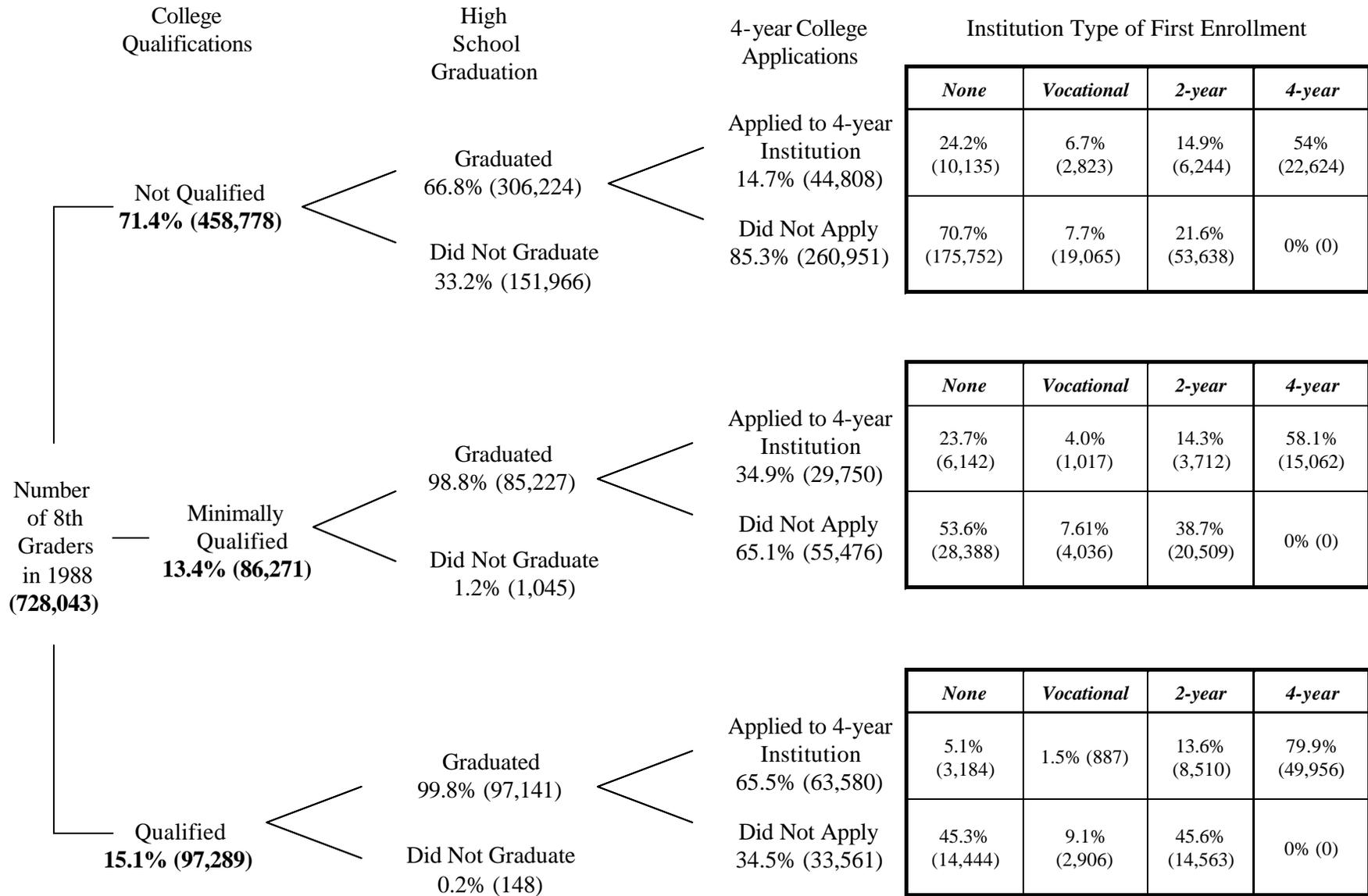
College Choice Variance by Socioeconomic Status

Substantial differences in the patterns of college choice emerge when one takes into account a student's socioeconomic status (SES). Seventy-one percent of the lowest-SES students do not obtain the academic qualifications necessary to support college enrollment. Lowest-SES students are 24.2% less likely to be qualified than the national average; fully 71% of lowest-SES students fail to gain the requisite qualifications. In contrast, only 30.3% of the highest-SES students do not obtain the requisite college qualifications. Interestingly, the graduation rates among the lowest-SES students at least minimally qualified are indistinguishable from the corresponding graduation rates for the highest-SES students (See Figures 2 and 3). Apparently, once students overcome the college qualification hurdle, the chances for lowest-SES students to obtain a high school diploma even out.

Completing the third task, actually applying to a four-year institution, appears to be particularly challenging for the lowest-SES students. Only 65.5% of the college qualified, high school graduates from lowest-SES backgrounds actually apply to a 4-year institution. This rate is 16 percent and 22 percent below the national rate of similarly qualified 8th graders and the rate for students from high-SES background, respectively.

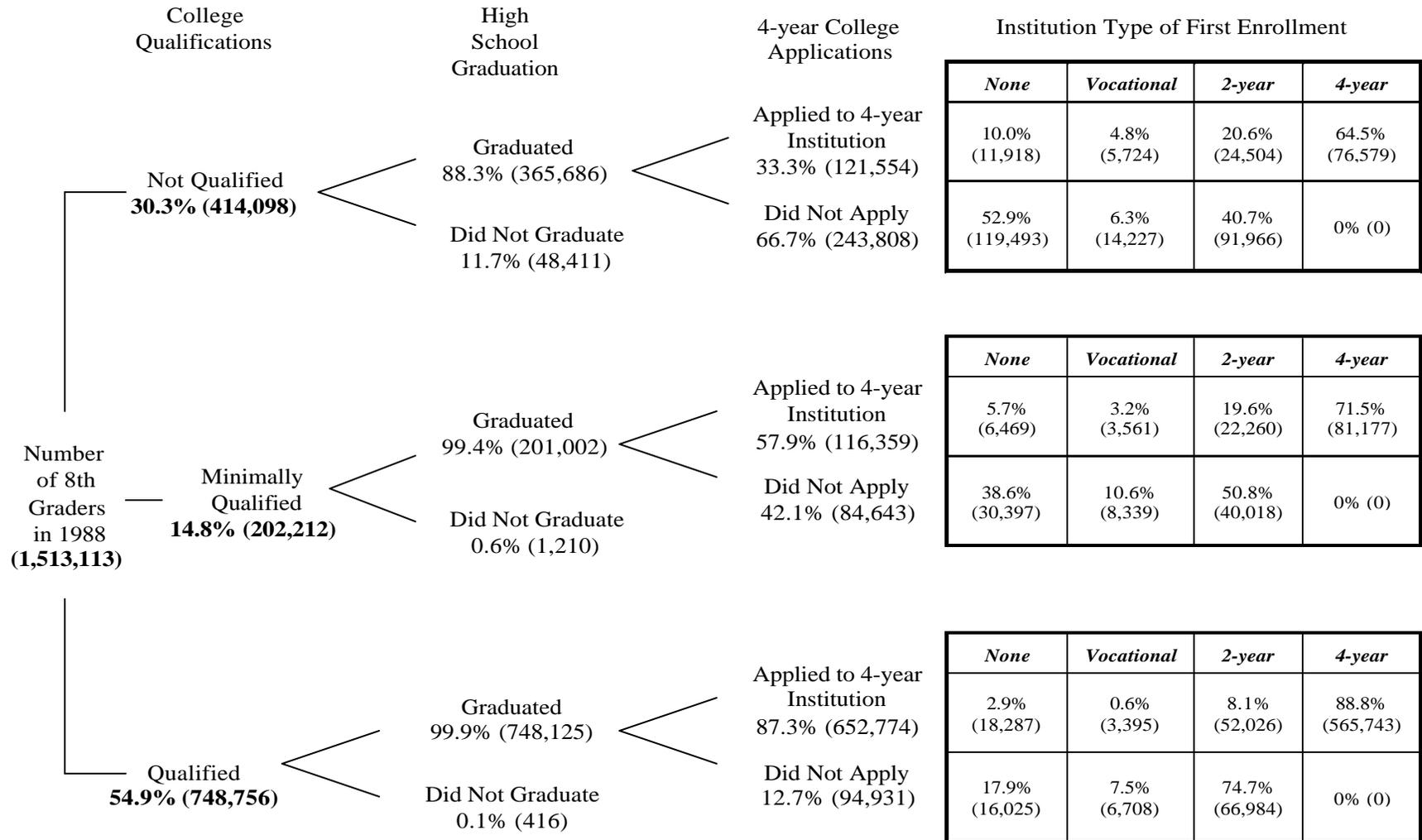
Once lowest-SES students complete the third task and submit an application, their chances of enrolling in a 4-year institution improve dramatically to the point of closely resembling the national average and the rate for the highest-SES students. Among qualified, lowest-SES, high school graduates, 80 percent enroll in a 4-year institution. College attendance rates for the high-SES and average 8th graders were 88.8% and 87%, respectively.

Figure 2. College Choice Process for Lowest SES Students



Based on National Educational Longitudinal Study 1988

Figure 3. College Choice Process for High* SES Students

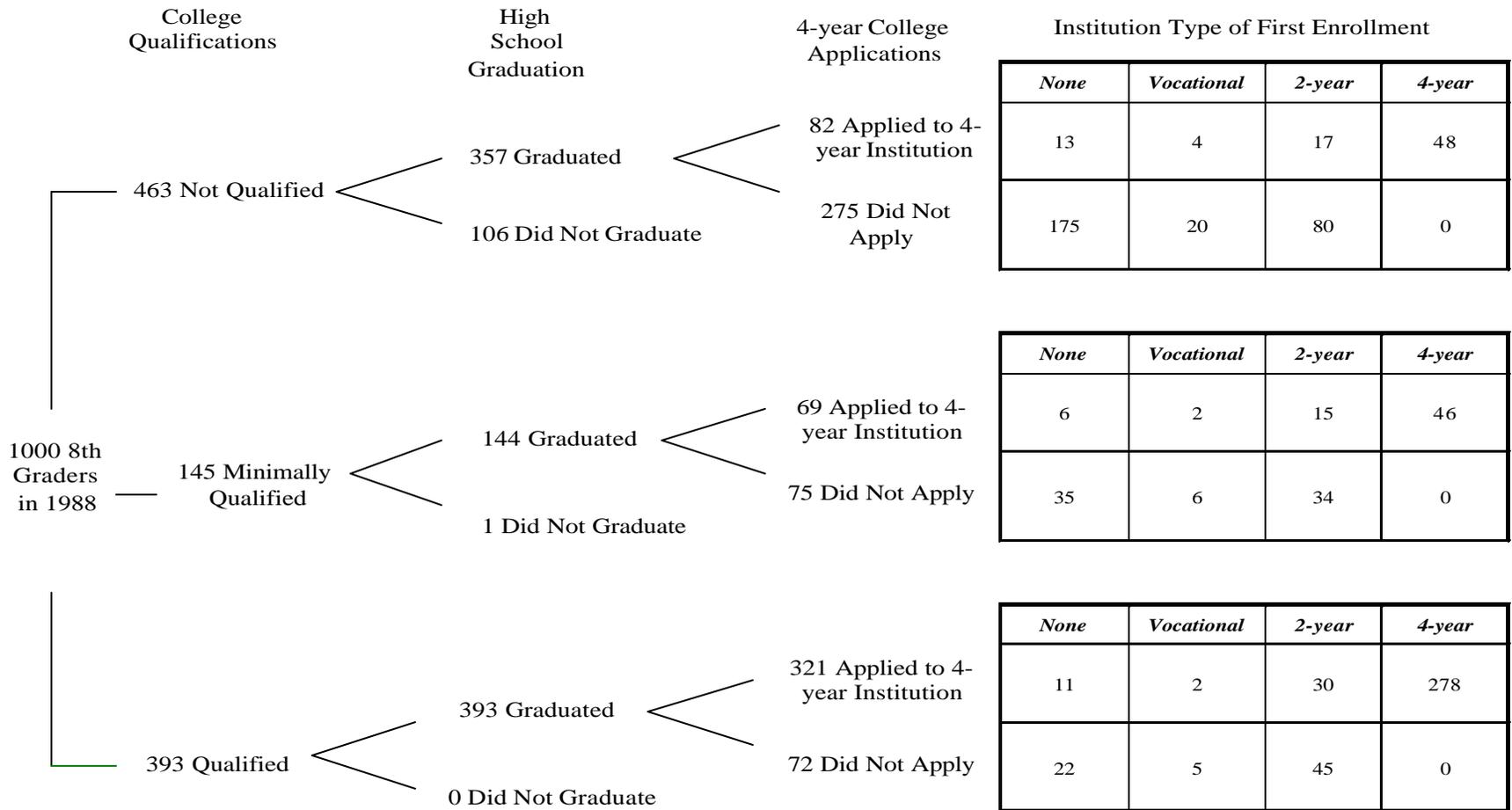


Based on National Educational Longitudinal Study 1988

*Includes Quartiles 3 and 4

Unfortunately, the use of proportions to portray and map the longitudinal stages of the college choice process masks vast discrepancies in the actual number of 8th graders completing these tasks within each socioeconomic group. On a national basis, only 278 out of 1000 8th graders that secured college qualifications, became high school graduates, and applied to 4-year institutions actually enrolled in a 4-year institution (See Figure 4). Among upper-SES students, 424 out of 1000 that acquired college qualifications, graduated from high school, and applied to a 4-year institution enrolled in a 4-year college or university (See Figure 5). Sadly, only 79 out of 1000 lowest-SES students overcame the same hurdles as their upper-SES counterparts and enrolled in a 4-year institution by 1994 (See Figure 6).

Figure 4. College Choice Process for 1000 1988 8th Grade Students



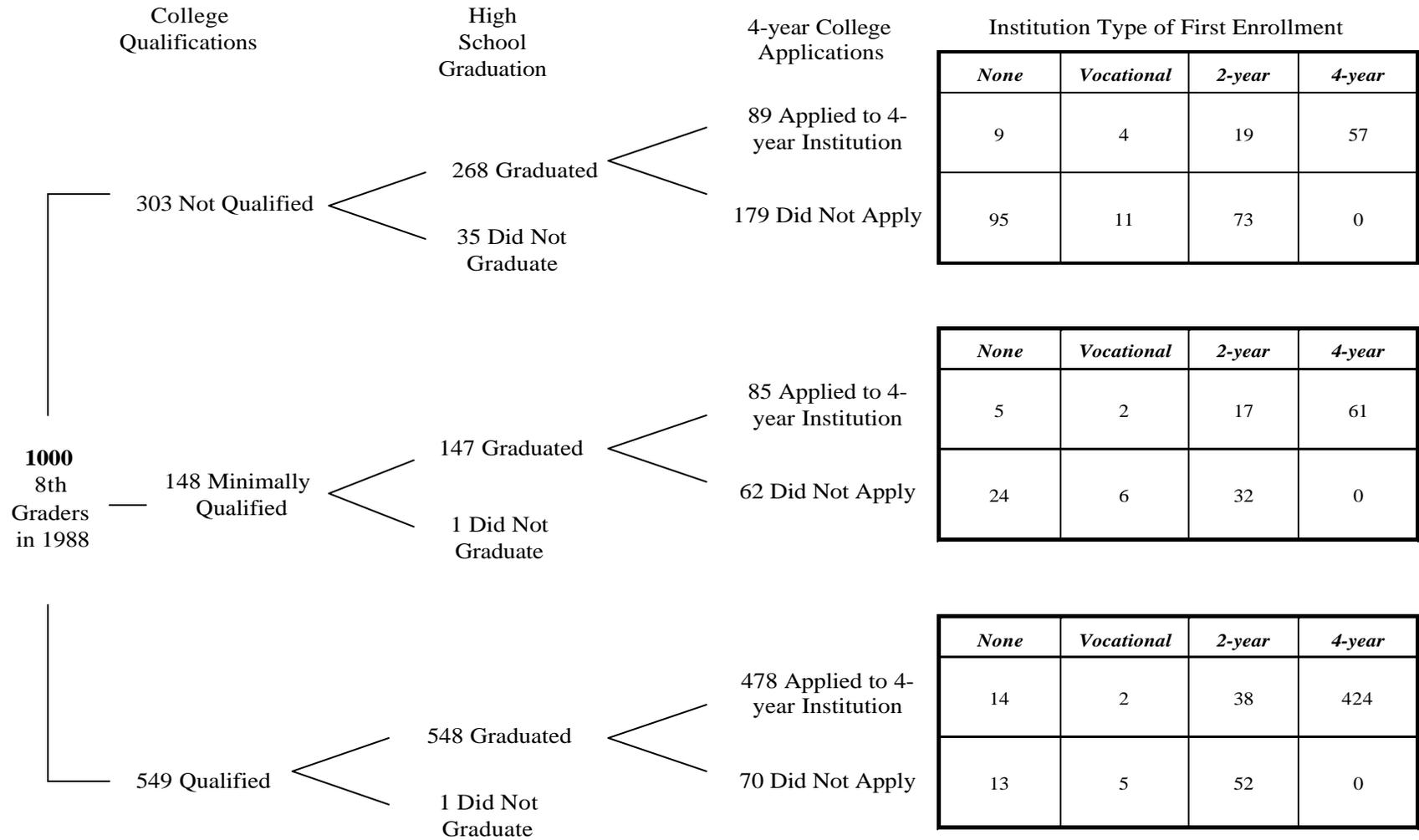
Institution Type of First Enrollment			
<i>None</i>	<i>Vocational</i>	<i>2-year</i>	<i>4-year</i>
13	4	17	48
175	20	80	0

Institution Type of First Enrollment			
<i>None</i>	<i>Vocational</i>	<i>2-year</i>	<i>4-year</i>
6	2	15	46
35	6	34	0

Institution Type of First Enrollment			
<i>None</i>	<i>Vocational</i>	<i>2-year</i>	<i>4-year</i>
11	2	30	278
22	5	45	0

Based on National Educational Longitudinal Study 1988

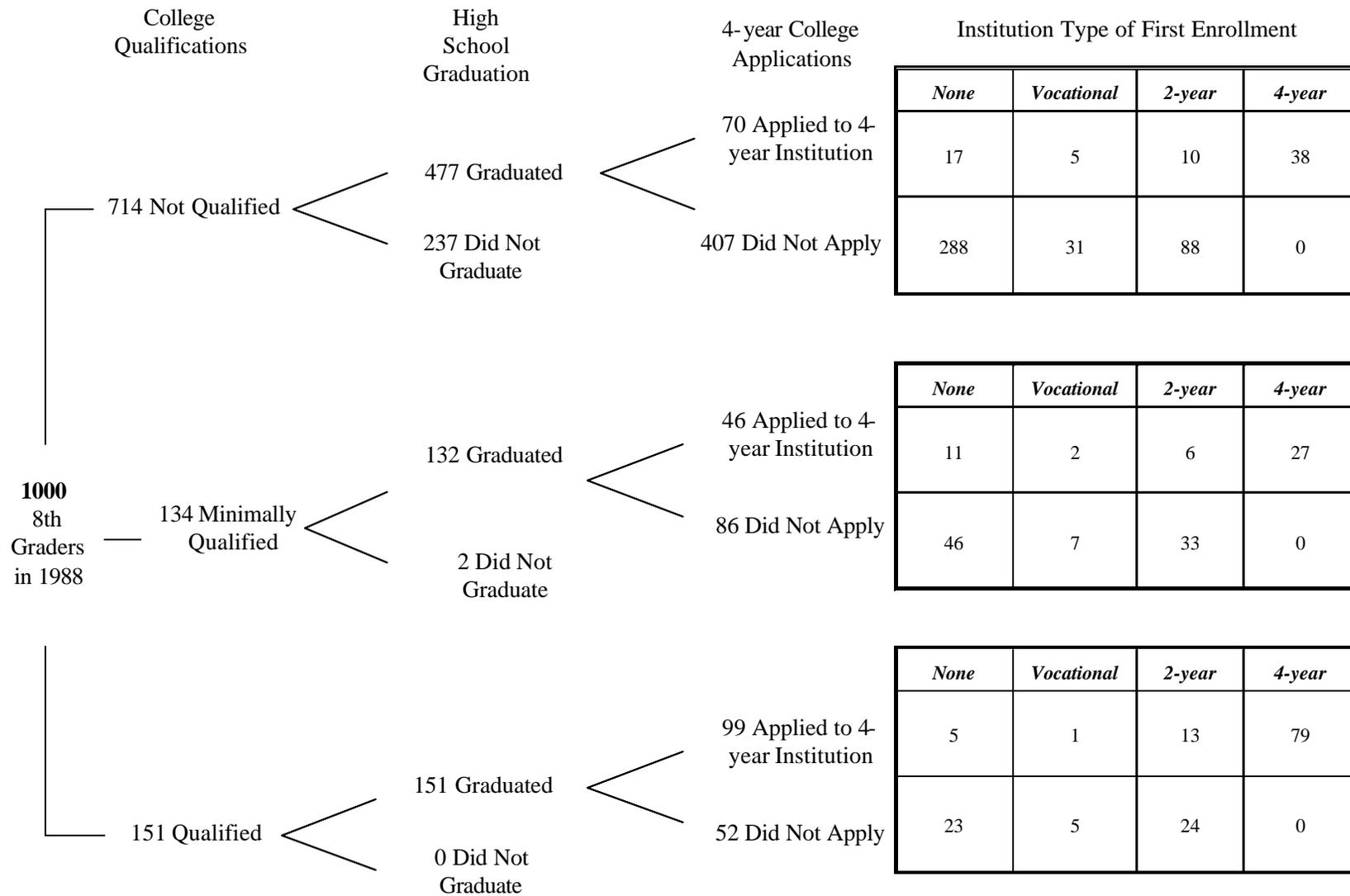
Figure 5. College Choice Process for 1000 High* SES Students



Based on National Educational Longitudinal Study 1988

*Includes Quartiles 3 and 4

Figure 6. College Choice Process for 1000 Low SES Students



Based on National Educational Longitudinal Study 1988

Purpose Statement

This report seeks to gain a better understanding of how economically and sociologically underprivileged Americans ready themselves for college. In so doing, it attempts to highlight those factors that affect the chances for lowest-SES students to secure college qualifications, graduate from high school, and apply to a four-year institution. To do this, we will first describe a model portraying the college choice process as the by-product of interrelated influences that begin as early as the 8th grade and continue until the high school graduate enrolls in college. Next, we will justify the use of socioeconomic status as an appropriate measure of disadvantage.

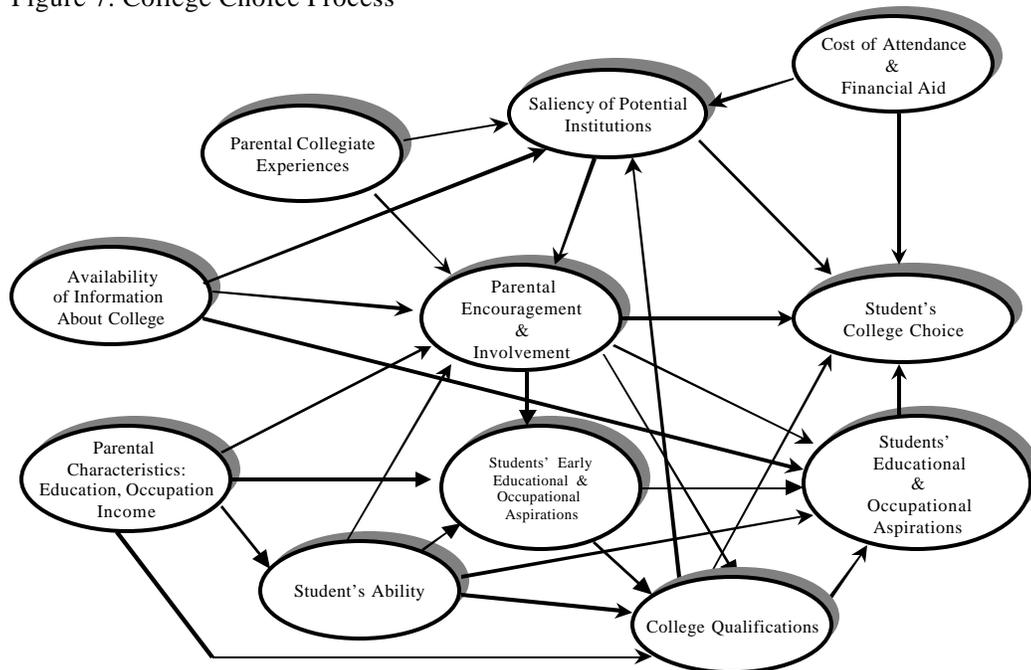
This work builds upon the college choice literature, while filling gaps with original analysis of the National Education Longitudinal Study of 1988. Of the national databases examined, this database is best suited to examine the three tasks critical to college choice because it tracks students from the 8th grade until after high school graduation. The vast explanatory potential of the NELS database is only now beginning to be tapped, and provides more up to date knowledge on how low-income students make college attendance decisions.

The College Choice Model

This report follows a conceptual framework that views a students' college choice as a three-stage, longitudinal process that begins as early as the 8th grade. Such an approach is consistent with the extant literature showing that collegiate experiences and outcomes are intrinsically and unavoidably linked with the decisions, plans and actions that students and their families undertook at the secondary level (e.g. Hossler, Schmit, & Vesper, 1999; St. John, Paulsen, & Starkey, 1996).

Figure 7 offers a schematic representation of the process linking the three college choice stages based on extant college choice literature. Parental encouragement and involvement, a pivotal force in the emergence of occupational and educational aspirations, is conditioned by the ability and high school preparation of the child, parental and sibling educational attainment, and access to information about college and costs. Parental encouragement, the availability of information about college, and perceived cost/benefit analysis of attending college also shape the institution set the student and family will seriously consider (e.g., McDonough, 1997). In turn, the final choice decision depends on the saliency of institutions, parental encouragement, financial considerations, the student's high school academic resources, the student's educational and occupational aspirations, and, of course, the student's academic abilities.

Figure 7. College Choice Process



Source: Based on Berkner & Chavez (1997), Flint (1993, 1997); Horn (1997); Hossler & Vesper (1993); Hossler, Schmit & Vesper, (1999); Perna (2000); Sewell & Hauser (1975); Stage & Hossler (1989); St. John (1990); Terenzini, Cabrera & Bernal (in press).

Validity of Socioeconomic Status (SES)

Research on college-choice has defined the concepts of “wealth” (broadly conceived) in several ways (See Appendix I: Wealth Matrix). Family income is the prevailing measure of wealth. Fifteen out of the 30 seminal college-choice studies we examined relied on family income as a wealth measure. Most income-based studies relied on students’ self-reported information (11 out of 16). On two occasions, financial aid records were used for verification. In eleven studies, income was divided into intervals, often arbitrarily defined. In seven of those income-based studies poverty thresholds were employed, as developed by the U.S. Census Bureau. Next to income, SES was the most commonly used wealth measure (11 out of 30).

In this report, we use SES instead of raw income data for analysis. Socioeconomic status⁴, as reflected in most of the datasets developed by The National Center for Education Statistics (NCES), is based on the following measures: parental education, parental occupation, items in the home reflecting either wealth or educational resources (e.g., dishwasher, books, magazines, although homeownership is not included), and family income. Three key theoretical, policy, and statistical arguments support the use of SES.

Income versus Wealth. “Income” and “wealth” have different meanings (Oliver & Shapiro, 1995). Income is the actual flow of dollars that pay for goods and services. Wealth reflects the history of acquisition of tangible income dollars, as well as “a kind of ‘surplus’ resource available for improving life chances, providing further opportunities, securing prestige, passing status along to one’s family, and influencing the political process” (Oliver

⁴Though Duncan (1961) developed the widely used socioeconomic index (SEI) to predict occupational prestige, socioeconomic status (SES) has become the preferred yardstick to reflect potential for social and economic mobility bestowed by one’s family background. This practice is particularly evident in the college choice-persistence literature. Thirty-seven percent of the studies we reviewed relied on some variation of SES (see Appendix I).

& Shapiro, 1995, p. 32). Wealth recognizes not only the income that is spent, but also the accumulation of assets and access. Oliver and Shapiro (1995) suggest three reasons for using wealth measures instead of income: the weak overlap between the distribution of income and wealth, inequalities in life chances that vary by subgroup access to wealth and its development, and the present availability of reliable wealth data. Using socioeconomic status allows us to account for a family's wealth. Therefore, when one examines two families with an equal amount of income, adding to the equation the assets and resources available to each allows one to make finer, more reliable distinctions in each family's experiences and access to social, economic, political, and educational opportunities.

Social and Cultural Capital. In addition to the differing assets and resources available to families with the same income, educational and occupational attainment, as well as neighborhood and social and occupational networks, add to the range of choices available to the potential college student. For example, one might compare the income of a college professor to that of a skilled factory worker and find similar incomes but very different social and cultural capital within their two families. The networks, neighborhoods, and resources available to a student aspiring to a college education are radically different for the professor's child than for the factory worker's child (e.g., Duncan, 1994). Coleman (1988) defines social capital as the resources obtainable within the social structure of a person's community—norms, social networks, and interpersonal relationships—that contribute to personal development and attainment. Bourdieu (1977) adds that attitudes, inclinations, competencies, and behaviors attached to a particular location on the socioeconomic ladder contribute to reproduce and augment one's cultural and social capital. Socioeconomic status indices, unlike income level, include social and cultural capital measures, such as parental educational background, along with income

allowing analyses and interpretations that account for the different “social locations” from which students come to their collegiate experiences.

Reliability and Validity of the Measures. Adelman (1998) points to the problematic nature of using income as the sole indicator of family wealth, especially when the data are self-reported. Research contrasting student’s self-reported income data against parent-reported income supports this observation. Fetters, Stowe, and Owins (1984), for example, examined the quality of responses from high school students to questionnaire items and found low levels of agreement between students’ and parents’ reports of family income and parental occupation. Fetters and his colleagues, however, reported high validity coefficients when income, parental education, and parental occupation were combined into a single indicator: socioeconomic status. Likewise, Adelman (1998) found that a single SES composite variable “washes out some (but not all) of the potential distorting effects of contradictions, anomalies, and outliers in its component parts” (p. 23). Fetters and associates’ results, combined with Adelman’s analyses, support using single composites that merge measures of family educational and occupational attainment and other measures of status and relative advantage. In addition to its reliability properties, Stevens and Featherman (1981) found the socioeconomic status index to be a valid correlate of such important measures of attainment as occupational prestige.

Race as a Valid Predictor of Socioeconomic Status (SES)

With the demise of race-based college admission policies prompted by court rulings and state initiatives, class-based affirmative action policies have emerged as a powerful alternative to increasing diversity in the college student body (Kallenberg,

1996). Class-based affirmative action policies rest on the assumption that minorities are disproportionately poor (Heller, 1997). In other words, class-based proponents assume that race and SES strongly correlate with one another.

When we examined the distribution of minorities in the lowest-SES strata who graduated from high school in 1992 and postsecondary attendees during 1994 (see Tables 1 and 2), we find support for class-based affirmative action policies. Indeed, it appears that minorities disproportionately come from lowest-SES backgrounds. Among 1992 high school graduates, 87 percent of all lowest-SES seniors were from minority backgrounds. In sharp contrast, only 12.7% were White (See Table 1). Two years later, the trend continues in college enrollment patterns with 30.1% of African Americans and 36% of Latinos from lowest-SES compared to only 6.9% of Whites. The percentage distribution of individuals within ethnicity by SES, in combination with national income inequality data, appears to support the notion that “race may be a proxy for income” (Heller, 1997, p. 643).

Table 1. Percentage distribution of 1992 high school graduates within ethnicity by SES

Ethnic group	SES			
	Lowest	Middle Lowest	Middle Upper	Upper
Native America	25.8%	28.6%	32.4%	13.2%
Asian American	14.8%	18.6%	26.6%	40.0%
Hispanic	43.9%	25.0%	17.7%	13.4%
African American	35.3%	26.6%	23.8%	14.2%
White	12.7%	23.9%	28.0%	35.3%

NOTE: Estimates are based on the NELS:88 weight for 1992 high school graduates (F3QWT92G)

Table 2. Percentage distribution of 1992 high school graduates who enrolled at either 2-yr or 4-yr Institution within ethnicity by SES

Ethnic group	SES			
	Lowest	Middle Lowest	Middle Upper	Upper
Native America	11.7%	23.5%	41.1%	23.7%
Asian American	13.9%	15.4%	26.5%	44.2%
Hispanic	35.9%	24.6%	21.7%	17.8%
African American	30.1%	23.1%	27.5%	19.2%
White	6.9%	20.0%	28.8%	44.3%

NOTE: Estimates are based on the NELS:88 weight for 1992 high school graduates (F3QWT92G)

When we examined the association between race and SES, both in high school and postsecondary education, we found it to be statistically significant but rather weak. The correlation between ethnicity and race among 1992 high school graduates is .179, and the corresponding correlation among 1994 college attendees was .194. Though significant, the association never surpasses 4% of shared variance between SES and race/ethnicity. In sum, at least 96% of variance in either SES or race is left unexplained.

Examining the distribution of ethnic groups within levels of SES reveals the reason behind the weak association between SES and ethnicity. The practice of examining SES within race masks the sheer number of Whites who are from lowest-SES backgrounds. Whites outnumber racial/ethnic minorities in each SES quartile, for both high school graduates and college attendees (See Tables 3 and 4).

Table 3. Percentage distribution of 1992 high school graduates within SES by ethnicity

Ethnic group	SES			
	Lowest	Middle Lowest	Middle Upper	Upper
Native America	1.3%	1.0%	1.1%	0.4%
Asian American	3.2%	3.0%	3.9%	5.0%
Hispanic	21.8%	9.3%	6.0%	3.9%
African American	20.1%	11.3%	9.2%	4.7%
White	53.6%	75.2%	79.9%	86.0%
Total	18.1%	24.1%	26.7%	31.2%

NOTE: Estimates are based on the NELS:88 weight for 1992 high school graduates (F3QWT92G)

Table 4. Percentage distribution of 1992 high school graduates who enrolled at either a 2-yr or 4-yr institution within SES by ethnicity

Ethnic group	SES			
	Lowest	Middle Lowest	Middle Upper	Upper
Native America	0.7%	0.8%	1.0%	0.4%
Asian American	5.2%	3.3%	4.2%	4.9%
Hispanic	24.3%	9.6%	6.1%	3.6%
African American	24.5%	10.8%	9.4%	4.6%
White	45.3%	75.6%	79.4%	86.5%
Total	11.8%	20.5%	28.1%	39.7%

NOTE: Estimates are based on the NELS:88 weight for 1992 high school graduates (F3QWT92G)

Among 1992 lowest-SES high school graduates, fully 54% were White. Whites also comprise the single largest ethnic group among lowest-SES college attendees, representing 45.3 percent. Class-based affirmative action admissions projections, based on the most recent high school graduation data (see Table 3, column 2), should yield 54 Whites, 20 African Americans, 22 Latinos, 3 Asian Americans, and 1 Native American out of 100 lowest-SES admits. These projections assume the best-case scenario in which all lowest-SES high school graduates are able and willing to attend college.

Once college qualifications are taken into account, the likelihood that a class-based affirmative action policy would disproportionately benefit ethnic minorities all but disappears (see Table 5). Out of 100 college qualified class-based admits, 56 would be White followed by 16 African Americans, 23 Hispanics, 4 Asian Americans and 1 Native American. Altogether, these findings clearly contradict the best hopes of class-based program advocates⁵.

⁵ Bernal, Cabrera and Terenzini (1999) reached similar conclusions when they examined the association between SES and ethnicity across three cohorts of students.

Table 5. Percentage of college qualified lowest-SES 1992 high school graduates⁶

Race/Ethnicity	College qualified
Native Americans	0.8%
Asian Americans	4.0%
Latino/Hispanics	23.0%
African Americans	16.1%
Whites	56.1%

The problem with a class-based policy as a viable substitute for a race-based affirmative action policy is one of *numbers*. As noted by Bowen & Bok (1998):

While Blacks and other minorities are much more likely than whites to come from poor families, they still make up a minority of all college-age Americans with low incomes (p. 47).

Questioning the validity of SES as a substitute of race is a conclusion largely consistent with the one reached by Olivas (1997). Having examined research on admission policies and postsecondary admission cases, Olivas concluded: “[t]here is no good proxy, no more narrowly tailored criterion, no statistical treatment that can replace race” (p. 1095).

Since the evidence does not support the notion that one can learn about the process affecting minorities' college participation behavior by examining the corresponding process among lowest-SES students, and vice-versa, the remainder of this report examines the college choice process among lowest-SES students. No presumptions regarding the applicability of these findings to minority students will be drawn.

⁶ College qualification was based on CQCOMV2, and index developed by Berkner and Chavez (1997) capturing college admissions criteria. See Table III.1 in Appendix III.

A Profile: Who Is Lowest-SES?

A number of points may shed light on the characteristics and backgrounds of lowest-SES students. The fact that low socioeconomic status is neither a predictor of race is important, however, additional knowledge of what lowest-SES status typically represents is a critical element necessary to understand the nature of the lowest-SES student experience. As evidenced by Table 6, income is a strong but not absolute predictor of SES status. Nearly one-third of families in the lowest-SES quartile report family incomes in the middle or high categories. As discussed in greater detail above, this finding may be susceptible to error given Adelman's (1998) concern over the self-reported nature of the data. Also relevant, but discussed in greater detail above, is the lack of association between race and SES quartile. Gender does not play an important role in the prediction of status either.

Table 6. Income, Parental Education, Gender, and Ethnicity by SES Quartile of 1988 8th Graders.

		SES				Degree of Association
		Lowest	Middle Lowest	Middle Upper	Highest	
Income	Low	70.5%	36.7%	21.0%	5.9%	.425
	Middle	25.3%	57.6%	68.4%	55.0%	
	High	4.2%	5.7%	10.6%	39.2%	
Parents Highest Education	HS or less	77.0%	38.3%	9.7%	0.7%	.655
	Some College	22.5%	58.7%	71.0%	16.4%	
	College Grad	0.5%	3.0%	19.3%	82.9%	
Gender	Male	47.7%	49.5%	50.6%	52.4%	.034
	Female	52.3%	50.5%	49.4%	47.6%	
Ethnicity	Asian / Pacific Islander	2.4%	2.8%	3.5%	5.1%	.183
	Hispanic	22.1%	9.8%	6.1%	3.9%	
	African American	22.7%	14.3%	10.9%	6.8%	
	Native American	2.5%	1.5%	1.4%	0.4%	
	White	51.2%	71.6%	78.1%	83.6%	

Note: Estimates are based on the NELS:88 panel weight (F3PNLWT)

Parental level of education, more so than income, however, does begin to address characteristics more central to an understanding of the issues lowest-SES students face throughout their college choice process. After all, college education is a cultural asset critical in social mobility (McDonough, 1997). Using a sample of 1995 low-income high school students who took the SAT, King (1996) noted that low-income high school seniors reporting *planning* to attend college at higher rates than expected had parents familiar with higher education. When considering those parents with at least some exposure to the requirements of college and the college choice process, our results indicate that at most 23 percent of lowest-SES parents can provide their children with any guidance based on first-hand collegiate experiences (see Table 6). In contrast, nearly all

of highest-SES students (99.3%) grew up in families knowledgeable of postsecondary education.

Parental education is not, however, the only differential factor that is affecting lowest-SES students on the path to college. Lowest-SES students also tend to be differentially “at risk.” Chen and Kauffman (1997) found that the likelihood of dropping out of high school was in direct proportion to the extent the student has: a) a record of poor academic performance during junior high school, b) a history of high school dropouts in the family, c) been held back a grade, d) been raised by a single parent, and e) changed schools more than twice. These five risk factors tend to be associated with lowest-SES students more so than students from other SES groups (see Table 7).

Table 7. Risk Factors by SES Quartile

	SES				Degree of Association
	Lowest	Middle Lowest	Middle Upper	Highest	
Student averaged Cs (2.5) or less in grades 6-8	53.4%	41.9%	33.5%	18.5%	.267
Student has other siblings that dropped out of high school	27.0%	16.1%	12.5%	4.1%	.232
Student was ever held back a grade	30.7%	18.5%	13.8%	9.0%	.210
Student from a single parent family	33.1%	21.1%	18.2%	12.9%	.181
Student changed schools more than twice	33.8%	30.3%	29.2%	28.3%	.045

NOTE: Estimates are based on the NELS:88 panel weight (F3PNLWT)

The degree of association for three of Chen and Kauffman’s risk factors and SES is fairly high and warrants attention. Lowest-SES students are 35% more likely to receive lower grades during the 6th through the 8th grades than are their high-SES counterparts.

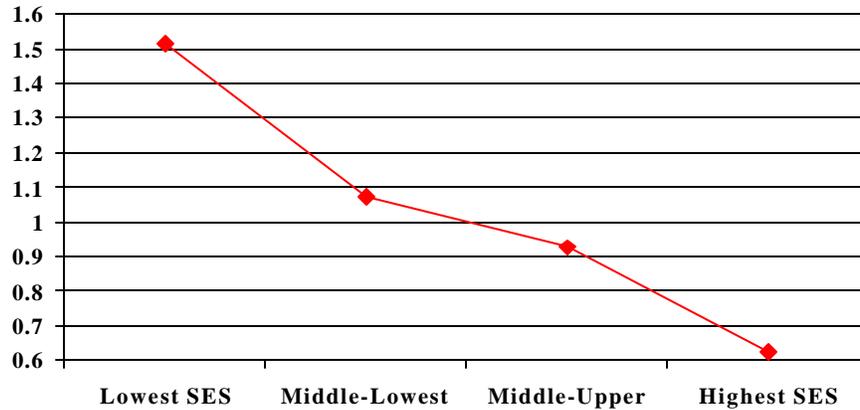
This period may be critically important, as this is the point where powerful predispositions toward college attendance are formed. Furthermore, this is the time when students lay the academic foundation upon which other subject matter is built during high school. Failure to achieve adequate academic preparations, even at this early stage, may inhibit a student's future prospects.

Additionally, lowest-SES students are almost 23% more likely to have older siblings that have opted to not complete high school. This characteristic may be extremely damaging to a student's prospects because first-hand knowledge of dropping out may increase acceptance of this path as a viable alternative. Finally, lowest-SES students tend to be held back one grade more often than their higher socioeconomic peers. Only 9% of high-SES students are held back a grade, whereas 30% of lowest-SES students are held back at least once during their academic career. Not only do each of these five risk factors tend to affect lowest-SES students more when the factors are considered individually, but when examining the risk factors as a group, they are more prevalent among the lowest-SES students.

The frequency with which 8th graders experience at-risk factors correlates negatively with their socioeconomic status ($r = -.294$). The higher a student's socioeconomic status the less likely the student is to be influenced adversely by the presence of risk factors (see Figure 8). On average, lowest-SES students tend to have at least one risk factor influencing their high school performance, whereas the upper middle and highest-SES students have less than one factor exerting an influence on their chance of success. This difference, though small, is withstanding. Chen and Kauffman showed

that an increase in just one more at-risk factor could quadruple the likelihood of dropping out from high school.

Figure 8. Mean at-risk factors across SES quartiles



Thus far this report highlights the vast discrepancies between backgrounds and experiences of the lowest-SES and highest-SES students on the path to college. Particular attention has been directed at the roles played by obtaining college qualifications, graduating from high school, and applying to a 4-year institution. Our findings and the supporting college choice literature suggest that these three tasks are critical to college enrollment. Evidence shows a clear disparity between the lowest- and highest-SES students with respect to the successful completion of these tasks. Therefore, the following sections examine the extent to which risk factors, along with other factors important to the college choice process, affect the acquisition of college qualifications, graduation from high school, and application to a four-year institution. We first examine college qualifications and graduation from high school.

II. Acquisition of College Qualifications and Graduation from High School

In following the 1000 1988 8th graders from lowest SES backgrounds on the path to college, only 285, less than one-third, secured some degree of college qualifications by the end of their senior year (see Figure 6). Of them, 151 were fully college-qualified. One hundred and thirty-four obtained minimal college-qualifications. By 1992, 760 members of the original class of 1000 lowest-SES 8th graders graduated from high school. In contrast, 697, or over two-thirds, of similar group of 1000 upper-SES students secured some degree of college qualifications by their senior year. The majority (549 out of 697) was qualified to begin collegiate work. By 1992, 963 upper-SES seniors graduated from high school (see Figure 5).

The literature suggests that acquisition of college qualifications and graduation from high school is embedded into what is known as the college-choice process (Hossler, Braxton, and Coopersmith, 1989). In undergoing each phase of the college-choice process, the high school student develops *predispositions* to attend college, *searches* for general information about college, and makes college attendance *choices*. As a precondition for the final stage, choice, the student must first meet two tasks: securing college-qualifications and graduating from high school. Acquisition of college qualifications, in turn, is a by-product of a student's ability and early development of educational plans to attend college as well as parental encouragement and involvement (see Figure 7).

Planning for college begins as early as the 8th grade and by the 9th grade most students have already developed occupational and educational aspirations⁷ (Eckstrom,

⁷ Eckstrom (1985) found that 61% of those high school graduates who enrolled in college had made the decision to go to college by 9th grade.

1985; Stage & Hossler, 1989). During this period the junior high school student comes to value a particular occupation and begins to see attending college as crucial in securing his or her occupational goals. Early college plans seems to play the role of a trigger mechanism in securing critical cultural capital. It enables 8th graders and their parents to plan for college-track curriculum and extracurricular activities, maintaining good academic performance and securing information about ways to finance college (e.g., Hossler, Schmit, & Vesper, 1999; McDonough, 1997)

Planning for college is affected by many factors that interact among themselves in a complex manner (Alexander & Eckland, 1975; Hauser, Sewell, & Alwin, 1976; Swell & Shah, 1978; Swell, Haller, & Portes, 1969). Higher socioeconomic status parents are more likely to talk to their children about college (Stage & Hossler, 1989). They are also more predisposed to make financial plans to pay for college (Flint, 1992) and are more knowledgeable of financial aid programs (Olson & Rosenfeld, 1984; Tierney, 1980). Among the factors predicting students' early educational plans, parental encouragement is the strongest (Conklin & Dailey, 1981; Hossler, Schmit, & Vesper, 1999; Stage & Hossler, 1989).

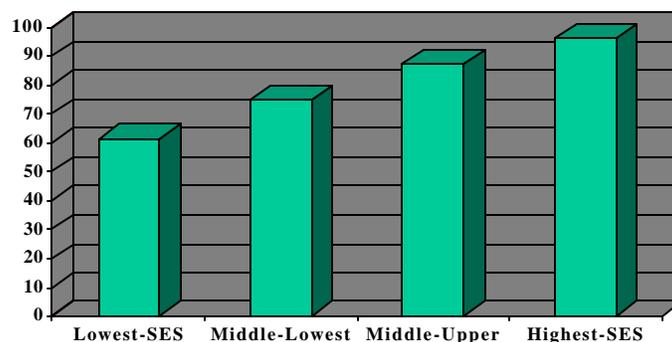
Research suggests parental encouragement has two dimensions. The first is motivational: parents maintain high educational expectations for their children. The second is proactive: parents become involved in school matters, discuss college plans with their children, and save for college (Flint, 1992, 1993; Henderson & Berla, 1994; Hossler & Vesper, 1993; Miller, 1997; Perna, 2000; Stage & Hossler, 1989).

Development and maintenance of postsecondary education aspirations among high school students is proportionally related to the frequency and consistency with which parents provide encouragement (Flint, 1992). Conklin and Daily (1981), for

instance, found that high school graduates entering a 4-year college were more likely to report consistent parental encouragement from 9th grade through the 12th grade. In contrast, students entering 2-year institutions were more prone to report mixed parental support across the high school years

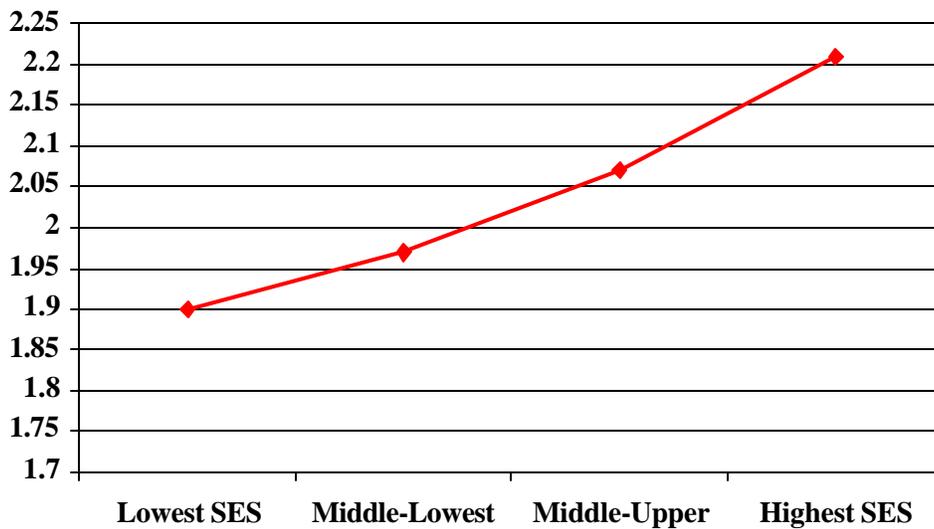
Parental encouragement matters for lowest-SES students' postsecondary plans. King (1996) noted that parental encouragement was a decisive factor in formulating postsecondary plans among a sample of 1995 low-income high school students. Low-income seniors, unsure whether their fathers were pleased with their postsecondary plans, were less likely than their better-off peers within their cohort to aspire to attend a public four-year college or university. King also concluded that income has a pervasive effect on postsecondary plans. The percentage of low-income students planning to attend a four-year institution or college lagged behind those for middle- and upper income seniors (66% vs. 80% and 85%, respectively). Our results regarding the connection between SES and early postsecondary plans are consistent with King's findings. Lowest-SES 8th graders were 34.5%, 25.7% and 13.6% less likely to develop postsecondary plans than are their upper, middle-upper and middle-lowest SES counterparts (see Figure 9).

Figure 9. Percentage of 8th graders planning to attend college by SES



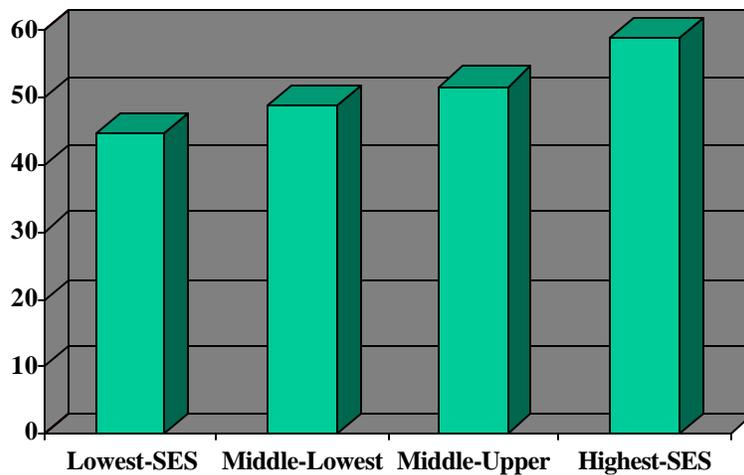
Perna (2000) has shown that parental involvement in school activities, as early as junior high, predicts whether or not the student would enroll in a four-year college or university after high school graduation. Our examination of NELS:88 indicates that parental involvement in 8th graders' school activities varies in direct relation with SES ($r = .252$). On average, upper-SES students reported higher levels of parental involvement than their lower SES counterparts (See Figure 10).

Figure 10. Average parental involvement in school activities across SES quartiles



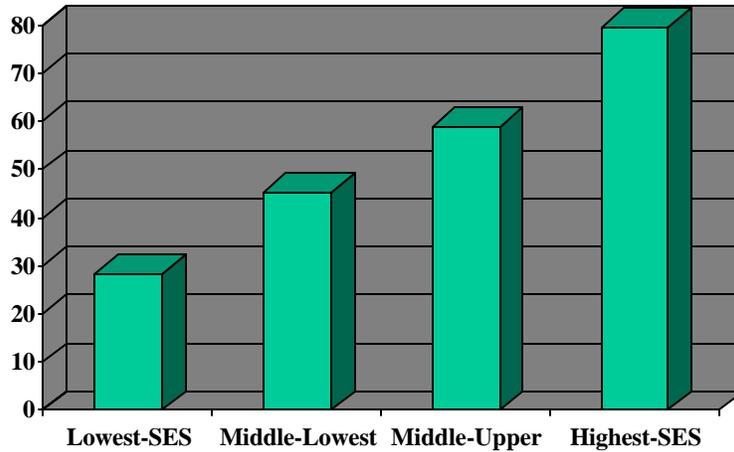
Research on occupational attainment also indicates that parents provide the most encouragement to the child with the highest academic ability (Hossler, Braxton, & Coopersmith, 1989). Ability does correlate with socioeconomic status among 8th graders ($r = .442$). Our results also show that lowest-SES 8th graders displayed lower standardized scores in math and reading (see Figure 11). And, consistently with the extant literature, we find a significant relationship between parental involvement and a student's ability. However, this correlation is weak (.169).

Figure 11. Average test score for 8th graders by SES



Adelman (1999) and Berkner and Chavez (1997) have shown that securing college-qualifications is a pivotal force in a student's decision to enroll in college. In the aggregate, discrepancies in college-preparation rates between socioeconomically advantaged and disadvantaged students are vast. Lowest-SES students are 51%, 30% and 18% less likely to secure minimal college-qualifications than their upper, middle-upper, and middle-lowest counterparts (see Figure 12). The degree of association between meeting minimal college-qualifications and SES was moderately high ($r = .377$).

Figure 12. Percentage of 12th graders at least minimally college-qualified by SES



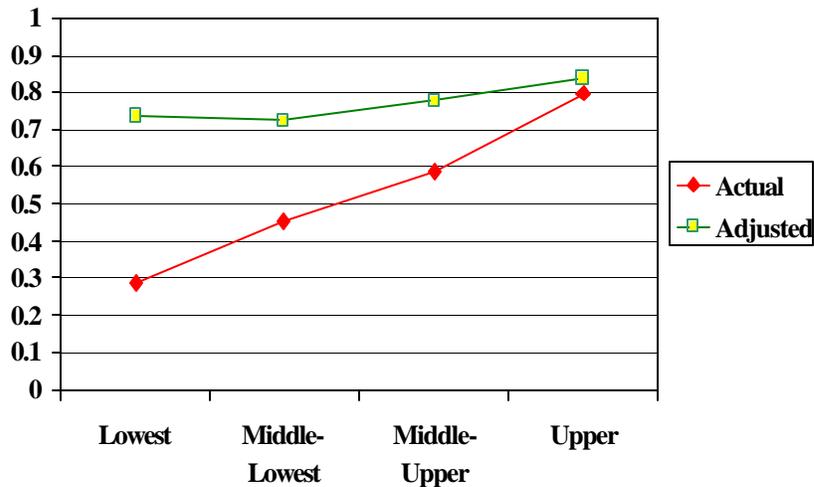
Factors Influencing Acquisition of College Qualifications and High School Graduation

A series of logistic regressions were run to control for the effects of background, ability, parental encouragement, and at-risk factors on the probability of securing at least minimal college qualifications by the end of 12th grade. Before controlling for these important college-choice factors, the difference between SES groups is substantial. The lowest-SES students are 51% less likely than highest-SES students to secure college qualifications (See Figure 13, *actual*). The large difference narrows dramatically when controlling for college plans in the 8th grade, ability in the 8th grade, steady parental involvement, and at-risk factors. After taking these college-choice factors into account, the net difference between lowest-SES and highest-SES students falls to only 15% (see Table 8 and Figure 13, *adjusted*).

Regardless of SES and ability, planning for college as early as the 8th grade and having parents involved in one's education are key factors that increase the likelihood of securing minimal college qualifications by the end of the senior year. Parental

involvement increases the likelihood of meeting minimal college qualifications by 18%, whereas early planning for college increases this likelihood by 17% (See Table 8). Being

Figure 13. Probabilities of securing at least minimal college qualifications by 12th grade by SES. Actual & adjusted



Note: Adjusted probabilities are estimated using a logistic regression model controlling for background, ability, parental involvement, college plans, and at-risk-factors (see Appendix IV, Table IV.1)

at-risk has a consistent negative effect on the likelihood of securing minimum college qualifications, regardless of the 8th grader’s socioeconomic status. Across all students, being at-risk decreases the chances of becoming minimally qualified for college by the senior year by 11% (See Table 8).

Table 8 also shows the resulting effects of background, encouragement, ability, and at-risk factors on the probability of securing minimal qualifications within each SES quartile. The most remarkable finding is the fact that ability in the 8th grade, consistent parental involvement, postsecondary planning in the 8th grade, and at-risk factors play an

important and consistent role within each of the SES categories. Our findings lead us to conclude that these influences are universal.

Table 8. Change in the probability of securing at least minimal college qualifications by 12th grade due to background, planning for college at eight grade, parental involvement, ability and at-risk factors.

Factor	All	Socioeconomic Status			
		Lowest	Middle Lowest	Middle Upper	Upper
Second Lowest-SES	-0.015	-	-	-	-
Upper Middle SES	0.058**	-	-	-	-
Upper SES	0.146***	-	-	-	-
Female	0.026	0.021	0.049	0.032	-0.002
Hispanic	0.014	0.029	0.067	0.018	-0.080
African American	0.014	0.077	0.046	0.043	-0.163***
Asian American	0.132***	0.147	0.125	0.209***	0.030
Planned for college at 8 th grade	0.168***	0.121***	0.191***	0.184***	0.102***
Parental involvement	0.181***	0.150***	0.157***	0.134***	0.146***
Ability at 8 th grade	0.029***	0.025***	0.031***	0.030***	0.018***
At-risk factors at 8 th grade	-0.110 ***	-0.084***	-0.116***	-0.125***	-0.054***
Number of cases	8,808	1,896	2,130	2,298	2,484
Baseline <i>p</i>	0.537	0.286	0.454	0.589	0.796
Model X^2 , df	4,078,11***	526.44,8***	879.87,8***	881.89,8***	653.93,8***
PCP	78.9%	75.6%	75.3%	77.7%	85.6%

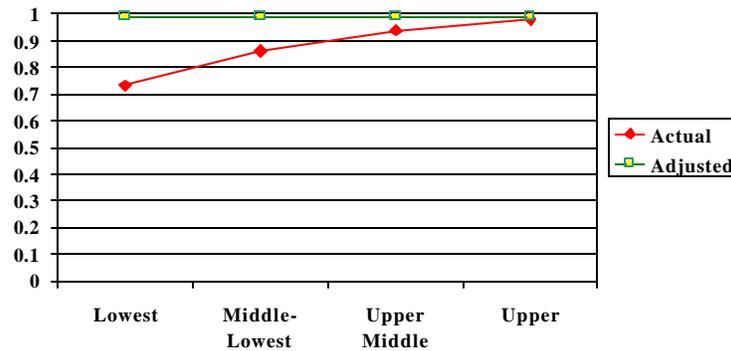
Note: Each case was weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (average weight = 199.02) to minimize the effect of large sample sizes on standard errors. Delta-*p* represents the change in the probability of securing at least minimal college qualifications due to a unit change in the factor variable under consideration. PCP represents the percent of cases correctly predicted by the model. PCPs higher than 55% signify a good fit for the model (see Cabrera, 1994).

The rate at which 1988 8th graders graduated from high school correlates with their socioeconomic status ($r=.291$). Overall, lowest-SES students are 25%, 21% and 13% less likely to graduate than their upper, middle-upper and middle-lowest SES counterparts (see Figure 14). Once college-choice factors are taken into account, the vast differences in high school graduation level out (see *adjusted* probabilities in Figure 14).

Securing college qualifications also increases the likelihood of graduating from high school by 8% (See Table 9). Moreover, securing college qualifications along with parental involvement, ability in the 8th grade, and at-risk factors evens out the likelihood of graduating from high school across each of the four SES categories (See Figure 14).

Among the poorest students, securing a minimum level of college qualifications increases the chance of graduating from high school by over 25%.

Figure 14. Probabilities of securing a high school diploma by SES. Actual & adjusted



Note: Adjusted probabilities are estimated using a logistic regression model controlling for background, ability, parental involvement, college plans, and at risk-factors (see Appendix IV, Table IV.1)

Table 9. Change in the probability of securing a high school diploma due to background, planning for college at eighth grade, parental involvement, ability, at-risk factors and securing minimal college-qualifications.

Factor	All	Socioeconomic Status			
		Lowest	Middle Lowest	Middle Upper	Upper
Second Lowest-SES	.009	-	-	-	-
Upper Middle SES	.055***	-	-	-	-
Upper SES	.076***	-	-	-	-
Female	-.033**	-0.040	-0.017	-0.075**	-0.001
Hispanic	.019	0.130***	0.006	-0.151***	0.006
African American	-.002	0.091*	-0.084*	-0.015	0.017
Asian American	.035	0.073	0.028	0.019	0.011
Planned for college at 8 th grade	.024*	0.003	0.067***	-0.011	-0.001
Parental involvement	.053***	0.092**	0.006	0.051***	0.014*
Ability at 8 th grade	.007***	0.011***	0.008***	0.006***	0.001
At-risk factors	-.046***	-.053***	-0.085***	-0.021*	-0.005
College qualified	0.114***	.256***	0.131***	0.056***	0.019***
Number of cases	8,807	1,896	2,130	2,298	2,483
Baseline <i>p</i>	0.881	0.733	0.863	0.939	0.980
Model X^2 , df	1459.45,12***	327.08,9***	448.34,9***	256.13,9***	80.45,9***
PCP	93.9%	85.4%	92.2%	96.9%	99.1%

Note: Each case was weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (average weight = 199.02) to minimize the effect of large sample sizes on standard errors. Delta-*p* represents the change in the probability of graduating from high school due to a unit change in the factor variable under consideration. PCP represents the percent of cases correctly predicted by the model. PCPs higher than 55% signify a good fit for the model (see Cabrera, 1994).

III. Applying to College

The third task on the path to college is overcoming the multiple hurdles embedded in the college application process. As is the case with securing college qualifications and completing high school, we find that the lowest-SES students are less likely to complete this task. Out of 1000 lowest-SES 8th graders only 215 will apply to a 4-year institution by the time they are seniors in high school (See Figure 6). In contrast, 652 out of 1000 high-SES 8th graders apply to a 4-year institution (See Figure 5). In other words, high-SES students are three times more likely to apply than their lowest-SES counterparts.

Applying to college and actually enrolling has been scrutinized under two lenses, one is economic in nature the other is sociological (St. John, Paulsen, & Starkey, 1996). The economic perspective regards enrollment as the result of a rational process in which an individual estimates the economic and social benefits of attending college, comparing them to those of competing alternatives (Manski & Wise, 1983). The sociological approach examines the extent to which high school graduates' socioeconomic characteristics and academic preparation predispose them to enroll at a particular type of college and to aspire to a particular level of postsecondary educational attainment. As noted by St. John, Paulsen, and Starkey (1996) both approaches converge in portraying low-income students as sensitive to financial considerations and academic preparation for college. Our analysis incorporates elements and prior research from both perspectives.

Saliency of Potential Institutions. Prior to applying to college, students develop strong preferences among institutions, evaluate their own qualifications for admission, ponder alternative mechanisms for financing college, and apply to colleges (Berkner & Chavez, 1997; Choy & Ottinger, 1998; Hossler, Braxton, & Coopersmith, 1989).

Development of expectations and perceptions about the quality of the institution, campus life, availability of majors, and one's ability to finance enrollment are the primary considerations shaping actual matriculation (Choy & Ottinger, 1998; Hossler, Schmit, & Vesper, 1999; McDonough, 1997; Tinto, 1993). High school seniors develop mental pictures of the institutions under consideration (St. John, Paulsen, & Starkey, 1996). These images lead the high school senior to form predispositions and commitments toward certain institutions. Within this context, perceptions of the availability of financial aid not only positively influence thoughts of matriculation, but they also predispose students to select a particular institution (Choy & Ottinger, 1998; Hossler, Schmit, & Vesper, 1999; Jackson, 1978; Olson & Rosenfeld, 1984; King, 1996; St. John, 1994a, 1994b; St. John *et al.*, 1996). Moreover, Flint (1993) found that knowledge of financial aid allows parents to consider a wider range of institutions than they might otherwise exclude

Students' Access to information. For three decades, socioeconomic factors also have mediated students' access to information about college. Using data from the National Longitudinal Study of the High School Class of 1972 (NLS:72), Tierney (1980) reported lowest-SES students had fewer information sources than upper-level SES students. Leslie, Johnson, and Carlson (1977) report similar findings. These researchers found lowest-SES students relied on high school counselors as the single most-likely source of information about college. In contrast, upper-income students report a variety of sources including parents, students, catalogs, college representatives, and private guidance counselors. While low-income students may be limited in their access to a

variety of sources of information, availability of high school-based academic information resources seems to level the playing field.

Based on the Parent Survey of the 1980 Senior Class of High School and Beyond, Olson and Rosenfeld (1984) found college-educated parents more knowledgeable than low-income parents not only about the different types of financial aid programs available, but about qualification criteria as well. Net of a parents' gender and college expectations for the child, parents' education and having children in college exerted the strongest effects on parental knowledge of financial aid programs. Strategies followed in securing information also affect the amount of knowledge the parents have regarding avenues to finance their children's college education. Olson and Rosenfeld reported that parents' knowledge of financial aid increased the most when they employed a variety of information-seeking strategies, including consulting with high school guidance counselors and bank loan officers, as well as by reading a variety of college financing pamphlets and books. Ikenberry and Hartle (1998) found that the amount and quality of information on college financing varies proportionally with socioeconomic status. Overall, upper-income families were more knowledgeable.

How active parents are in planning to finance their children's college education also seems to be dependent upon their own collegiate financial experiences. Drawing from the 1990 National Postsecondary Student Aid Study, Flint (1997) documented an intergenerational effect whereby parents' plans to finance their children's college education were shaped by the strategies parents themselves followed when financing their own undergraduate educations. Having been recipients of parental financial support

or financial aid themselves motivated parents to contemplate a wide range of possibilities to finance their children's college education.

King (1996) noted that low-income high school seniors who constantly consulted with a high school counselor regarding postsecondary plans were more disposed to plan attending college. The same effect on postsecondary plans was noted among those low-income students who received information about admissions and financial aid from representatives of colleges' admission and financial aid offices. Using data from the High School Class of 1992 (NELS:88), Berkner and Chavez (1997) found college qualified low-income students more likely to discuss financial aid with high school counselors and teachers (72%) and college representatives (49%) than were their middle-income (63% and 45%) and high-income (47% and 34%) peers.

In planning for college, 1992 high school seniors relied on a wide variety of sources of information, a pattern closely resembling the one documented by King. Sources included: talking to high school teachers and counselors, speaking to college representatives, speaking to other adults, and reading information on federal and institutional programs (See Tables III.1 and III.2 in Appendix III). Financial aid concerns dominate lowest-SES students' information collection activities (See Table 10). Lowest-SES seniors were 5% and 4% more likely to discuss financial aid with high school staff and college representatives, respectively. Also noteworthy is the fact that a substantially large proportion of the highest-SES seniors also report consulting with high school and college personnel concerning financing college.

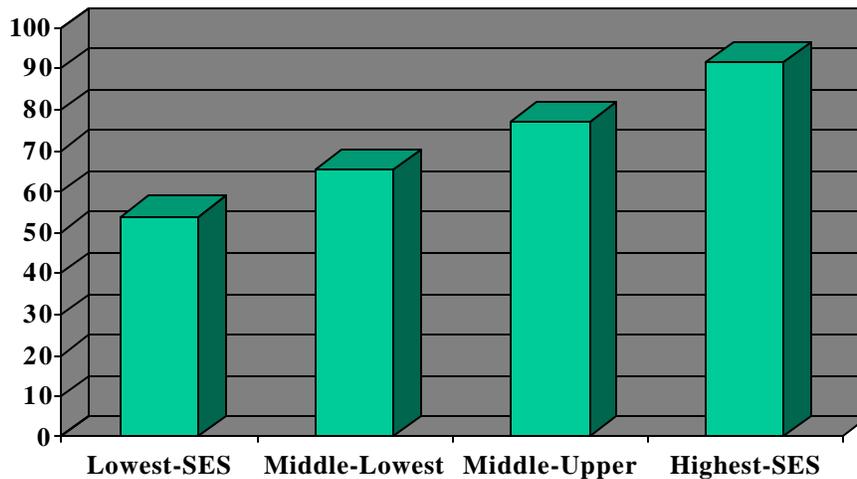
Table 10. Association of information collection activities by SES quartile

	Specific Activity	Lowest SES Quartile	Middle Lowest	Middle Upper	Highest SES Quartile	Correlation
<i>Information Sources</i>	Talk to teachers/counselors about financial aid	54.8	55.9	57.3	48.9	.069**
	Talk to college representative about financial aid	40.0	38.8	40.5	36.1	.037**
	Read information on aid from colleges / universities	44.7	46.4	44.9	43.5	.021**
	Read DOE information on aid	25.6	24.2	26.7	23.5	.030**
	Talked to other adults about financial aid	56.0	59.1	63.3	61.2	.052**

Research shows that applying to college is in part the result of accumulation and assimilation of information necessary to develop the student's short list of institutions that the 12th grader will apply to. Securing college-related information is heavily influenced by parental encouragement (Conklin & Dailiey, 1981; Flint, 1992; Litten, 1982). When focusing only on sources of information on financial aid, we find a weak correlation between parental encouragement and expectations for postsecondary education and sources of information. These correlations are .182 (involving highest parental expectations) and .157 (parental involvement in student's education).

Also noteworthy, is the fact that lowest-SES students, in relation to high-SES students, are less likely to receive high levels of parental encouragement. In other words, the population most in need is the least likely to receive this form of cultural capital. While 92% of upper-SES 12th graders have parents expecting them to secure at least a bachelors degree, only 54% of the lowest-SES students report having parents holding such expectations. The correlation between parental expectations and socioeconomic status is .320 (see Figure 15).

Figure 15. Percentage of parents expecting at least a Bachelors degree in the 12th grade by SES



Our review of the literature identified a substantial gap regarding the factors that compel students to apply for college admission. With few notable exceptions (e.g., Berkner & Chavez, 1997; Jackson, 1978; St. John & Noell, 1989), the literature concentrates on enrollment. In so doing, a key linkage has been overlooked: college attendance can only take place *if, and only if*, a student submits college applications. Moreover, applying to college triggers access to information about the institutions and available academic and financial aid assistance that otherwise would not be accessible to the students and their families. This information along with financial aid offers can be enough to motivate actual enrollment. Jackson (1978), for instance, found that receiving offers of financial aid on the part of the institutions increased the likelihood of college enrollment by 15% among lowest-SES 1972 high school graduates.

It stands to reason from a policy perspective, that intervention strategies will be more successful if they seek to influence those factors that predispose students to actually apply to college. Our findings emphasize that when lowest-SES seniors apply to a four-year institution, they do enroll at rates almost identical to other SES groups (See Figures 2 and 3). Applying to college is strongly associated with a student's SES ($r = .414$). Lowest-SES seniors are 54% less likely to apply to a 4-year institution than are their high-SES counterparts (See Figure 16). These proportions fail to consider the powerful effects of those factors most likely effecting application to college; namely parental involvement, securing the necessary college qualifications, aspirations, school based assistance, and background factors. Once we control for these college-choice factors, the 54% gap separating the lowest- from the highest-SES students, narrows to 26.4% (See Figure 16). In fact, there is no significant difference in the likelihood of applying to college for those students in the bottom half of the SES distribution (See Table 11). However, in relation to middle-upper SES students, the lowest-SES students are still 15% less likely to apply.

High school seniors' postsecondary education expectations are a powerful predictor of eventual application to a four-year institution. Those aspiring for at least a bachelor's degree are 28% more likely to apply than those with no postsecondary education aspirations. Those aspiring for an advanced degree are even more likely to submit a college application (34%).

Having parents with high educational expectations matters. Those 12th graders whose parents expected them to earn at least a bachelors degree were 26% more likely to

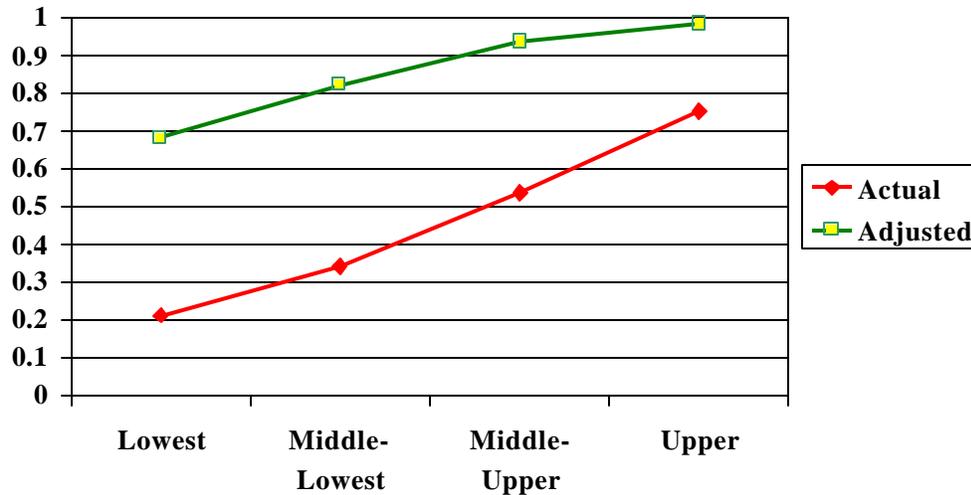
apply to a 4-year institution. Parental expectations beyond the bachelors degree improves 12th graders likelihood of applying by 22%.

Table 11. Changes in the probability of applying to college among 12th graders due to background, at-risk factors, parental involvement, parental educational expectations, college-qualifications, information & resources, and degree aspirations.

Factor	All	Socioeconomic Status			
		Lowest	Middle Lowest	Middle Upper	Upper
Second Lowest-SES	.020	-	-	-	-
Upper Middle SES	.145***	-	-	-	-
Upper SES	.264***	-	-	-	-
Female	-.009	-.025	.038	.019	-.053
Hispanic	-.000	.009*	-.110	-.077	.009
African American	.125***	.108*	.129*	.225***	.005
Asian American	.125***	.171	.198	.109	.026
Risk factors	-.065***	-.052***	-.073***	-.029	-.065***
Parental involvement	.072***	-.030	.143***	.052	.059
Parent expected some college	-.002	.009	-.037	-.064	.106
Parent expected bachelor's	.255***	.235***	.285***	.219***	.166***
Parent expected advanced degree	.219***	.171**	.212***	.184***	.166***
College-qualifications	.140***	.122***	.137***	.127***	.091***
Information on Financial Aid	.050***	.053***	.064***	.050***	.016
Help in college application	.113***	.067	.091*	.164***	.050
Help in financial aid procedures	.029	.022	.028	.018	.021
Help in college essays	.081***	.060	.070	.047	.071**
Aspired for some college	-.014	.008	.011	-.054	-.042
Aspired for a Bachelor's	.276***	.306***	.300***	.246***	.137***
Aspired for advanced degree	.336***	.388***	.333***	.288***	.186***
Number of cases	7,417	1,393	1,732	2,022	2,270
Baseline <i>p</i>	.467	.213	.342	.537	.755
Model X^2 , df	44422.51,20***	666.15,17***	1,031.06,17***	1,014.28,17***	791.78,17***
PCP	82.8	82.8	81.0	80.4	87.0

Note: Each case was weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (average weight = 199.02) to minimize the effect of large sample sizes on standard errors. Delta-*p* represents the change in the probability of applying to college due to a unit change in the factor variable under consideration. PCP represents the percent of cases correctly predicted by the model. PCPs higher than 55% signify a good fit for the model (see Cabrera, 1994).

Figure 16. Probabilities of applying to a 4-yr institution by SES. Actual & adjusted



Note: Adjusted probabilities are estimated using a logistic regression model controlling for background, ability, parental involvement, college plans, and at risk-factors within each SES quartile (see Appendix IV, Table IV. 1).

The extant literature shows that quality and intensity of the high school curriculum, along with meeting other qualification factors, most affects the likelihood of college attendance and success (Adelman, 1999; Berkner & Chavez, 1997). Those findings also apply when considering application to a four-year college or university. For every one-unit increase in a student's college qualification score, the likelihood of submitting college applications rises by 14% (See Table 11).

Accumulating information on financial aid and receiving school-based assistance with the college application process also makes a difference. For every one-unit increase in the amount of financial aid information, a high school student improves his or her likelihood of applying by 5% points. Receiving help with application materials and college essays at school enhances the chances of applying by 11% and 8%, respectively.

Earlier, we reported that being at-risk of dropping out from high school significantly decreased an 8th grader's chances of becoming college qualified and graduating from high school. Similarly, we find that being at-risk decreases the

likelihood of applying to college by the 12th grade. Every at-risk factor, possessed as early as the 8th grade, decreases the likelihood of applying to college by the 12th grade by 7% points.

African-Americans and Asian-Americans are 13% more likely to apply to college than their White counterparts. Female 12th graders do not differ in the likelihood to apply. These results confirm Perna's (2000) recent findings regarding the probability of enrolling in a 4-year institution among 1992 high school graduates.

Factors affecting all 12th graders chances of applying to college are remarkably similar to those affecting the most disadvantaged high school students (Column 2 compared to Column 3 in Table 11). Notable differences include the lack of effect that parental involvement and high school based resources play in a lowest-SES student's chance of applying to college (See Table 11). The reasons for this are apparent, on average lowest-SES students simply do not receive adequate parental involvement and their parents tend to hold low educational expectations. Additionally, a lowest-SES 12th grader has, on average, 33.4% less information than his or her middle-upper SES counterpart.

The significance of this finding lies in the fact that the most disadvantaged students are not substantially different than students from higher SES groups when it comes to the factors that encourage application to four-year institutions. We conclude that the factors promoting college attendance are universal. It is important to note that even after controlling for relevant college choice factors, there still is a 26.4% gap in the college application rate between lowest-SES students and highest-SES students. Reasons

for this gap may include substantial differences in ability to pay for college, the quality of information, and aspects of cultural capital beyond the scope of this study.

IV. On the path to college: Summing up

Enrolling in a four-year college requires the completion of at least three critical tasks: meeting minimal college-qualifications, graduating from high school, and actually applying to a four-year college or university. Eighty-one percent of those 1988 8th graders who completed these three tasks enrolled in college (see Figure 1 on page 8). The path to college among socioeconomically disadvantaged 8th graders can best be characterized as hazardous. By the 12th grade, only 285 out of 1000 8th graders from lowest-SES backgrounds secured at least minimal college qualifications (See Figure 6). By the end of the senior year, only 215 applied to four-year colleges or universities. Two years after high school graduation, only 144 enrolled at a four-year institution. Next to equally college qualified high school graduates from upper-SES backgrounds, a lowest-SES high school graduate was 22% less likely to apply to college (See Figures 2 and 3).

College choice as a process (see Figure 7)

In order to explain the factors that encourage students to complete each task, we advanced a college choice model portraying college enrollment as the culmination of a process beginning as early as the 8th grade and ending when the high school graduate submits college applications (see Figure 7). In this model, a student's college choice is unavoidably linked to a student's academic ability, the amount and quality of parental encouragement and involvement received, his or her early educational and occupational aspirations, the amount information available about college, and his or her acquisition of college qualifications.

In testing this model, we were limited by the availability of variables in the NELS:88 file. Nevertheless, the richness of this data enabled our analysis to test most of the propositions embedded into our college choice model

Because many of the college choice variables examined are intertwined, we used logistic regression to single out the net effects of individual variables at each step on the path to college. The steps examined by our analysis were: a) acquisition of college qualifications, b) graduation from high school, and c) applying to a four-year college or university.

Acquisition of college qualifications (see Table 8)

Securing at least minimal college-qualifications correlates with socioeconomic status ($r = .377$). In the aggregate, lowest-SES students are 51%, 30% and 17% less likely to secure minimal college qualifications than their highest, middle-upper, and middle-lowest SES counterparts. These gaps narrow substantially once such influential college-choice factors as parental involvement and ability are taken into account. Net of these college-choice factors, the lowest-SES students are nearly 15% less likely to secure minimal college qualifications next to their upper-SES counterparts. Parental involvement in a student's education is pivotal for his or her chances of fulfilling the college qualification task. Each unit increase in parental involvement accounted for an 18% increase in a high school student's likelihood of securing minimal college qualifications. Early planning for college also matters. Students who planned to attend a four-year institution by the time they were in the 8th grade were 17% more likely to secure minimal college qualifications by the end of the senior year. On the negative side and regardless of socioeconomic status, experiencing at-risk factors such as coming from

single-parent families, having siblings who dropped out of high school, changing schools, having poor academic performance or repeating grades decreased the chance of becoming college qualified by 11%.

High school graduation (see Table 9)

The rate at which students complete their high school education correlates with their socioeconomic status ($r = .291$). The high school graduation rate among the poorest high school students was 73%, a figure that sharply contrasts with the 98% graduation rate exhibited by the high-SES students. This 16% gap in the graduation rate narrows to nearly half once college-choice factors are considered. Securing college qualifications most influenced completing high school. Across all SES categories, securing college qualifications increased the chance of completing high school by 11.4%. The critical role played by college qualifications was particularly evident among the lowest-SES students. For these students, chances of completing high school increased by nearly 26% when minimal college qualifications were obtained by the student's senior year.

Applying to college (see Table 11)

Applying to college varies in direct relation with socioeconomic status ($r = .414$). In the aggregate, differences in college application rates between the poorest and the highest-SES high school students are vast. Whereas 21.3% of the socioeconomically disadvantaged high school students applied to college, 76% of upper-SES high school students submitted college applications to four-year institutions (See Table 11). Controlling for relevant encouragement, qualifications, and other college choice factors reduced the gap in college application rates between lowest-SES and upper-SES students from 55% to 26.4%. While high socioeconomic backgrounds bestow high school

students with a clear advantage, it is evident that motivational, college qualifications, as well as family and school based resources all boosts students' likelihood of applying to a four-year institution. High school students that aspire for at least a bachelor's degree are nearly 28% more likely to apply to college than those holding lower formal education aspirations. Aspiration for an advanced degree increases application rates still further by 34%. High school students whose parents hold expectations for a bachelor's degree are 26% more prone to apply to college. Securing college qualifications during high school increases a students' chances of apply to a four-year college or university by 14%. High school resources devoted to assist in the college application process also make a difference. Seniors who rely on high school counselors for writing college application essays and filling up paper work are 8% and 11% percent more likely to apply to college. Information about financial aid also helps. Every unit increase in the amount of information the senior has regarding financial aid enhances his or her chances to apply to college by 5%.

V. Intervention Strategies

What matters?

Our results clearly show that intervention strategies seeking to increase college participation rates among socioeconomically disadvantaged high school students need to be holistic. Given the high degree of interdependence between family and school based resources, it is unrealistic to assume that one “single shot” policy by itself would facilitate their success on the path to college.

Targeting the acquisition of college qualifications seems to be a most fruitful area for policy intervention. Its importance reverberates in two out of the three tasks examined by this study. The critical importance of being college qualified extends well beyond the application process. As masterfully shown by Adelman (1999b), the academic resources secured at the elementary and secondary education levels make completion of a college degree a certainty. Programs must ensure that 6th, 7th and 8th graders, and especially their parents, are aware of curriculum needed to succeed in college.

Becoming college qualified, in turn, presupposes high parental involvement in school activities as well as early planning for college (Henderson & Berla, 1994). And, as our literature review shows, parental involvement is directly related to the amount of information parents themselves have regarding college. First-hand exposure to postsecondary education greatly facilitates access to this information. College educated parents are more likely to see the long-term benefits associated to a college degree and to communicate this information to their children (Coleman, 1988). They are also more knowledgeable of the curricular requirements and mechanisms to finance college

education (Flint, 1992, 1993; McDonough, 1997). In this respect, lowest-SES students are most disadvantaged. Whereas 99.3% of upper-SES parents have some formal college education, barely 23% of lowest-SES parents have been exposed to higher education (See Table 6). It stands to reason that information efforts targeting lowest-SES parents would yield the highest pay-off.

Parental involvement in children's school activities, as well as parental educational expectations are likely to be enhanced if lowest-SES parents see a connection between a college degree and economic and social benefits. Equally important is parental knowledge of curricular strategies and financial planning needed to meet the goal of securing a college education. Information on financial planning need not be detailed; providing parents with general, concise and clear data on college costs and financial aid may suffice to motivate them to start saving for their children's postsecondary education and to learn about different financial aid packages (Hossler, Smith & Vesper, 1999; Olivas, 1985). A plausible source of this information is the postsecondary institution itself (Adelman, 1999a). Colleges and universities are in the unique position of explaining to parents the importance of curriculum planning as early as in the 8th grade. They are well aware of the specific academic skills and knowledge needed to undertake different academic majors. Moreover, colleges and universities' expertise with financial aid application procedures uniquely qualify them to assist lowest-SES parents to overcome their fears of qualifying for need-based financial aid (Olivas, 1985).

School partnerships, as early as the elementary level, constitute another promising domain in which parental involvement can be fostered the most. A lowest-SES student's acquisition of study habits, literacy skills, and commitment to life-long learning seems to

be fostered the most when involvement comes from both parents and schools (Clark, 1983). Partnerships have an extra advantage: they provide information and skills lowest-SES parents themselves may need to become involved in decisions pertaining to curricular planning and school activities for their own children (Henderson & Berla, 1994)

Being aware of the curriculum and other college-related requirements one needs to meet may not suffice when the elementary and secondary institutions do not provide what Adelman (1999a) dubs an "opportunity-to-learn." As noted by McDonough (1997), differences in college attendance rates among varied SES groups can be explained in part by the quality of the high school they attended. Little change would take place if the nation's lowest-SES students attend schools lacking labs, engaging and adequate curriculum, innovative instructional techniques, qualified teachers, appropriate computer equipment, books, and academic and career advising to make this "opportunity-to-learn" a vibrant reality.

The talent search program: A beacon of hope

Based on the findings of our analysis, it stands to reason that programs that focus their attention on those factors enabling students to successfully complete the three critical tasks on their path to college will most benefit lowest-SES students. The Talent Search program seems to be an example of one such program.

In 1965 the Talent Search Program, originating in the Higher Education Act, was created to help low-income Americans whose parents lack college education offset institutional and sociological disadvantages on their path to college (Trent, 1992). In so doing, this program sought to identify talented individuals to "improve college

preparation," "complete secondary school," and encourage students to "enroll in postsecondary education" (Trent, 1992, p.1). When crafting the Talent Search program, legislators emphasized the three critical tasks investigated by this study.

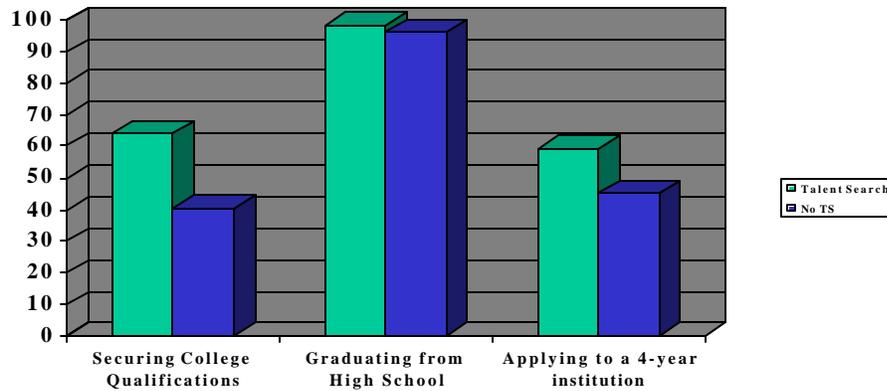
In recent years, a vast body of literature has confirmed the insight and wisdom of those early policy makers (Becker, 1994). Indeed, children are more likely to succeed on their path to college when parents are involved in their learning both at home and at school (Henderson & Berla, 1994). This report also confirms the efficacy of the three-part emphasis. When we examine Talent Search participation among lowest-SES students in the National Education Longitudinal Study database, we find that two out of the three objectives are being met (See Figure 17).

Trio participants are approximately 24% more likely to become college qualified. Though small, the correlation between Talent Search participation and securing at least minimal college qualifications is positive ($r=.229$). There are no distinctions in the high school graduation rates between participants and non-participants ($r=-.076$). However, Talent Search participants are almost 14% more likely to apply to a 4-year institution immediately following high school graduation. The correlation between participation and applying to a 4-year institution is small but positive ($r=.135$). Of these three relationships, the one between Talent Search participation and securing college qualifications is the strongest.

Earlier we reported that having greater information of financial aid was an important factor in increasing the probability of applying to college among lowest-SES students. In this context, it is important to note that Talent Search participants, on

average, relied upon one more information source than did non-participants ($F=2540.303$; $df=1$; $p<.001$).

Figure 17. Percentage differences in securing college qualifications, graduating from high school and applying to college among lowest-SES students



Note: Participation rates estimated via panel weight (F3PNLWT)

Conclusions

This report identified three critical tasks all students need to complete on their path to enrollment in a four-year institution. Comparative analysis of lowest and highest-SES patterns associated with the completion of these three tasks reveals substantial differences between the two groups. These SES-gaps are reduced if not even out once a number of influential school-based and family originated factors are taken into account. In other words, family-based, school-based and individual-based practices are as important if not more than is family's SES in becoming college-qualified, graduating from high school and applying to a 4-year institution. Our findings along with the extant literature validate initiatives and programs seeking to provide critical encouragement, information and college preparation resources to socio-economically disadvantaged youth. The Talent Search program is one such program.

Appendix I Definitions of Wealth

An extensive review of the literature on college choice, collegiate experiences and outcomes was conducted in search of seminal papers examining the role of wealth related indicators (e.g., income, parental education, socioeconomic status). Thirty seminal studies were identified through ERIC database searches and solicitations of the expertise of 24 top scholars researching issues of access and persistence in higher education. The studies used a variety of methodologies and data sets to assess the impact of wealth measures on a range of higher education issues. Each study was analyzed to ascertain collegiate outcome(s) addressed, data source, and definition of wealth. Wealth measures varied widely across the studies being family income the most commonly used (50%). Thirty-eight percent of the college-choice studies relied on SES.

Researchers	Outcome(s)	Databases Used								Definitions of Wealth
		BPS:89-90	NPSAS	HSB:So	HSB:Sr	NLS-72	NELS:88	Inst.	Multi-inst.	
Adelman (1998,1999b)	Persistence to graduation	X		X		X				2 Lowest-SES and SESINC composite quintiles
Berkner & Chavez (1997)	Enrollment						X			Low income (<\$25,000), middle-income (\$25,000 - \$74,999) and high-income (\$75,000 or more). Income reported by parents in 1988.
Bowen & Bok (1998)	Graduation, academic outcomes, civic participation & satisfaction with life								X	Lowest-SES(Three levels). SES scores based on self-reported family income and parental education.
Cabrera, et al. (1990)	Persistence				X					2 lowest-SES quartiles
Choy (2000)	Financing college						X			Income below 125% of the federally established poverty threshold given family size
Choy & Ottinger (1998)	College choice		X							Low income (<\$30,000), middle income (\$30,000-\$69,999) and high income (\$70,000) or more. Dependent students.
Choy & Premo, MPR (1996)	Financing College	X	X							Income below 125% of the federally established poverty threshold given family size
Cuccaro-Alamin & Choy (1998)	Financing College	X	X							Lowest-SES quartile (middle 2 combined)
Flint (1992)	College Choice								X	Self-reported family income by \$10,000's (compared to Census %), no breakdown analysis for low income students
Flint (1997)	College Choice:		X							Self-reported family income by \$10,000's (compared to Census %), no breakdown analysis for low income students

Definitions of Wealth (Continues)

Researchers	Outcome(s)	Databases Used								Definitions of Wealth
		BPS:89-90	NPSAS	HSB:So	HSB:Sr	NLS-72	NELS:88	Inst.	Multi-inst.	
Hearn (1992)	College Choice				X					SES scores
Horn & Chen, MPR (1998)	College Choice & Persistence						X			Lowest-SES quartile and 5 at-risk factors
Horn & Nuñez (2000)	Enrollment						X			1991 Parents' reported income Low (<\$25,000); middle (\$25,000-\$74,999) and high (\$75,000 or higher)
Jackson (1978)	College Choice-Application Stage					X				Lowest-SES third
King (1996)	College Choice: Planning to attend								X	Self-reported <\$20,000 (lowest quartile nationally)
Leslie, Johnson & Carlson (1977)	College Choice: Planning to attend							X		Self-reported Low (\$7,500); middle (\$7,500-\$15,00); and high (>\$15,000)
Leslie & Brinkman (1986)	Degree Completion								X	Summary of 25 different institutional research studies
Leslie & Brinkman (1988)	College Choice								X	Summary of 25 different institutional research studies
Manski & Wise (1983)	College Choice Persistence					X				Self-reported family income Lower (<\$16,900); Middle (\$16,900 - \$21,700) & Upper (>\$21,700)
McPherson & Schapiro (1998)	College Choice								X	Self-reported family income <u>1980</u> <\$10,000; \$10,000-\$15,000;\$15,000-\$30,000; \$30,000-\$50,000, \$50,000-\$100,000; and >\$100,000 <u>1994</u> <\$20,000; \$20,000-\$30,000;\$30,000-\$60,000; \$60,000-\$100,000, \$100,000-\$200,000; and >\$200,000
Nuñez & Cuccaro-Alamin, MPR (1998)	First Generation College Students	X								Lowest-SES quartile (middle 2 combined)

Definitions of Wealth (Continues)

Researchers	Outcome(s)	Databases Used								Definitions of Wealth
		BPS:89-90	NPSAS	HSB:So	HSB:Sr	NLS-72	NELS:88	Inst.	Multi-inst.	
Perna (2000)	Enrollment						X			Parents' education from (1) less than high school to (5) advanced degree
Stampen & Cabrera (1988)	Persistence								X	Financial aid records. Classification based on demonstrated financial need: Need 1 (mostly Pell grants); Need 2 (based on GLS analysis system); NonNeed (based on criteria other than economic need) and Nonaided.
St. John & Noell (1989)	College Choice: Applying & Enrolling				X	X				Self-reported family income, no breakdown analysis for low income students
St. John (1990a)	College Choice: Enrollment			X						Self-reported family income: <\$15,000, \$15,000-24,999, \$25,000-39,999, and >\$40,000
St. John (1990b)	Persistence				X					Self-reported family income: <\$15,000, \$15,000-24,999, \$25,000-39,999, and >\$40,000
St. John (1994a)	Pricing			X						SES quartiles and 3 Need simulations (1- mostly Pell grants, 2- eligibility for other need-based aid, 3- not considered eligible for need-based aid)
St. John, et al. (1994)	Persistence		X							<\$11,000, \$11,000-29,999, \$30,000-\$59,999, and >\$60,000, no breakdown analysis for low income students
St. John, et al. (1996)	Choice & Persistence		X							<\$11,000,\$11,000-29,999, \$30,000-\$59,999, and >\$60,000, no breakdown analysis for low income students

Appendix II

Weights Employed in the Analyses

1988 Panel weight (F3PNLWT). Adjusts the NELS:88 data to reflect the number of 8th graders in the population in 1988 (N=2,968,427).

Weight for 1992 high school graduates (F3QWT92G). Adjusts the NELS:88 data to reflect the estimated number of subjects in the population who received a high school diploma between September 1, 1991 and August 31, 1992 (N=2,356,268).

Adjusted weight (DWEIGHT). Perna (2000) correctly notes that the use of weights tends to affect estimated standards errors and parameters. Consequently, she suggests estimating adjusted weights resulting by dividing the original weight by the average weight for the sample as a method to minimize the effect of large sample size on standard errors. Accordingly, the panel weight F3PNLWT was divided by the average weight in the sample (average weight = 199.02) resulting in DWEIGHT. The weighted sample using F3PNLWT produces 2,968,427 cases whereas DWEIGHT yielded 14,915. All logistic regression results are based on DWEIGHT. As shown below, DWEIGHT adjusts the original sample size reproducing the proportion of subjects the original weight was designed to capture without artificially increasing the original sample size.

SES	1988 Panel Weight (F3PNLWT)		DWEIGHT	
	N	%	N	%
Lowest	728043	24.5	3658	24.5
Middle-Lowest	727018	24.5	3653	24.5
Middle-Upper	732705	24.7	3682	24.7
Highest	780408	26.3	3921	26.3
Total	2,968,174	100%	14,914	100%

Appendix III

Table III.1. Description of NELS:88 variables employed

Background variables

Gender (F3SEX) coded as 0 (Male) and 1 (Female) and ethnicity (F3RACE). Ethnic categories included Hispanic (1), African American (2), Asian American (3) and White (4). Native Americans, due to their small number, were excluded from the logistic regression analyses.

Socioeconomic Status

Quartile coding of base year SES (BYSESQ). This variable was built upon respondent's socioeconomic status at the time he/she was an 8th grader in 1988. Socioeconomic status, as defined by variables within NCES datasets, includes the following measures: parental education, parental occupation, items in the home (i.e., dishwasher, books, etc.), and family income. This variable ranged from 1 (Lowest-SES) to 4 (Upper-SES). As shown in table below, estimates of subjects across SES categories vary as a function of the weight under consideration.

SES	1988 Panel Weight (F3PNLWT)		1992 HS Grads Weight (F3QWT92G)		Unweighted	
	N	%	N	%	N	%
Lowest	728043	24.5	386279	18.1	3663	26.5
Middle-Lowest	727018	24.5	514718	24.1	3389	24.5
Middle-Upper	732705	24.7	569821	26.7	3345	24.2
Highest	780408	26.3	666648	31.2	3423	24.8
Total	2,968,174	100%	2,137,466	100%	13820	100%

Parental Income

Parents' reported 1991 gross family income from all sources before taxes (F2P74). To maintain consistency with Berkner and Chavez (1997), 13 income categories were collapsed into three: low (less than \$25,000), middle (\$25,000 to \$74,999) and high (\$75,000 or more).

Ability at 8th grade

Composite standardized score (BY2XCOMP) of the reading and mathematic tests applied to all subjects in 1988. The test score ranges from 30.93 to 75.81.

High Math

Based on high school transcript data drawn from the High School & Beyond/Sophomore cohort, Adelman (1999b) demonstrated that the academic intensity and quality (ACRES) of a student's high school curriculum is a better predictor of degree attainment next to standardized tests, high school ranks and cumulative grade point average. Among the components of ACRES, emphasis on math, in particular, proved to be one of the best predictors of college success. Adelman found that taking math courses beyond Algebra II doubled a high school student's chances to complete a college degree. Horn and Nuñez (2000) reached similar conclusions when they examining enrollment behavior among the high school class of 1992. Using high school transcript data, our approximation to Adelman's HIGHMATH is made up of the following categories:

1. None
2. Algebra I
3. Algebra I and/or Geometry
4. Through Algebra II
5. Beyond Algebra II

College Qualification Index

Developed by Berkner and Chavez (1997), the college-qualification index (CQCOMV2) attempts to approximate college admissions criteria. Thus, the index is based on cumulative academic course GPA, senior class rank, the 1992 NELS aptitude test scores, and the SAT and ACT scores. Moreover, Berkner and Chavez adjusted this index to account for having taken rigorous high school academic work. The college qualification index ranges from 1 (not qualified) to 5 (very highly qualified). We found the college-qualification index to correlate significantly with the HIGHMATH, a scale developed after Adelman's HSB/So HIGHMATH variable (1999). The correlation between CQCOMV2 and HIGHMATH was .723. Berkner and Chavez reported that meeting minimal college qualifications significantly predicts college enrollment. To maintain consistency with Berkner and Chavez's approach, we dichotomized the college-qualification index to reflect the absence (0) or presence of being at least minimally college qualified. We used this dichotomized variable as both dependent and predictor in logistic regression models depicted in tables III.2 and III.3 in appendix III. CQCOMV2, in its original metric, was used in the regression model displayed in table III.4.

At-risk factors

Composite of five dichotomous NELS:88 variables indicating whether the 8th grader came from a single-parent family (BYFCOMP), had siblings who dropped out from high school (asked in the 10th grade, (F1S94)), changed school two or more times from 1st to 8th grade (BY40), had average grades of C or lower from 6th to 8th grade (BYGRD68), and repeated an earlier grade from 1st to 8th grade (BYS74). The scale ranges from 0 to 5.

Parental Involvement in Students Education

Composite of six items reflecting the extent to which subjects agree having discussed with parents: a) school courses (F1S105A), b) school activities (F1S105B), c) thing studied in class (F1S105C), d) school grades (F1S105D), e) how to prepare for the ACT/SAT test (F1S105F), and d) going to college (F1S105G). Each item was assessed in a Likert scale ranging from 1 (never) to 3 (often). Perna (2000) found these six items factoring into a single highly reliable ($r=.83$) and predictive scale of college enrollment for the 1992 high school class.

Highest parental expectations

Derived from the highest expectations respondents' felt either their mother (F2S42B) or father (F2S42A) had for them in their education, this variable is made of the following categories:

1. Parents had no postsecondary expectations or the respondent was unsure what their expectations were.
2. Parents expected the respondent to attend either a 2-year academic or technical college, a trade school or some college.
3. Parents expected the respondent to complete a bachelor's degree.
4. Parents expected the respondent to secure advanced degrees (MS/PhD/Professional)

Information sources on financial aid

Factorially derived scale made up of five NELS:88 items indicating whether the 12th grader read information on aid from the US Department of Education (F2S58D) or colleges /universities (F2S58E), or talked to high school counselors (F2S58A), college representatives (F2S58B), loan officers (F2S58C) or adults (F2S58G) about financial aid. The factor solution accounted for 48.4% of the correlation matrix. The corresponding scale has an alpha reliability of 0.73. Factor loadings are reported below.

Information Sources on Financial Aid	Loadings
Teachers/counselors (F2S58A)	0.704
College representative (F2S58B)	0.706
Read DOE information about financial aid (F2S58D)	0.599
Read information on aid from colleges/universities (F2S58E)	0.761
Other adults (F2S58G)	0.700

High school based support

Three variables were identified signifying as to whether the student received help from his or her high school with college (F2S57A) and financial aid (F2S57C) application procedures, and assistance in writing college application essays (F2S57B).

Planned for college at 8th grade

Relied upon by Berkner and Chavez, BYS45 identifies the highest degree planned to obtain by the 8th grader. We created a dichotomous variable signifying whether the 8th grader planned to obtain at least a four-year degree (1) or not (0).

Planned ever to attend PSE

Developed by Berkner and Chavez, PLANS92 captures 12th plans to continue their formal education at some point after high school completion. Berkner and Chavez coded plans in terms of type of institution planned to attend. The categories are:

1. No postsecondary institution
2. Student planned to attend either a 2-year academic or technical college, or a trade school.
3. Respondent planned to attend a 4-year college.

Educational expectations in 1992

Developed by Bekner and Chavez, F2ASPIRE92 captures 12th graders' highest educational expectations after high school completion. The categories are:

1. No postsecondary education.
2. Respondent expected to complete trade or vocational school or some college.
3. Respondent expected to complete a bachelor's degree
4. Respondent expected to complete an advanced degree (MS/PhD/Professional)

Applied to a 4-year institution

Developed by Berkner and Chavez (1997), EVR4YRA signifies whether or not the 12th grader applied to a 4-year institution. Though based on self-reported data, Berkner and Chavez corrected missing cases as having applied if subjects enrolled at a four-year institution.

First type of Institution Attended as of 1994

Developed by Berkner and Chavez, F3SEC2A1 tracks type of institution attended as of 1994. The categories they developed include:

1. No postsecondary enrollment as of 1994
2. Private, not for profit less-than-year.
3. Public less-than-2yr.
4. Public 2-year.
5. Private, not-for-profit 4-year
6. Public 4-year.

For the purpose of this study categories 2-3 were collapsed into a single category termed: Vocational. Based on the information provided in Berkner and Chavez institution types 2 and 3 did not appear to offer a degree at the associate level. Moreover, several of the analyses they conducted made a clear distinction between category types 2 and 3 and 2-year and 4-year institutional types. Categories 5-6 were collapsed to form the category 4-year. By 1994, college enrollment distribution was as follows:

First Type of Institution Attended as of 1994 (Based on F3SEC2A1)

	N	Percent
None	1,053,663	37.3
Vocational	121,980	4.3
2-yr	610,753	21.6
4-yr	1,039,600	36.8
Total	2,825,995	100.0

Note: Based on panel weight F3PNLWT

Table III. 2. Descriptive statistics for the variables employed in the logistic regression models

Variable	N	% Cell	Mean	S.D.
SES				
Lowest	3,658	24.5		
Middle Lowest	3,653	24.5		
Middle Upper	3,682	24.7		
Upper	3,921	26.3		
Gender				
Male	7,473	50.1		
Female	7,441	49.9		
Ethnicity				
Hispanic	1,542	10.5		
African American	1,987	13.5		
Asian American	525	3.6		
White	10,642	72.4		
Planned for college at 8 th grade				
Yes	11,620	78.9		
No	3,117	21.1		
Parental involvement	12,750	-	2.05	.45
Test score at 8 th grade (math & writing)	14,364	-	50.59	10.04
At-risk factors	11,188	-	1.04	1.08
At least minimally college qualified				
Yes	6,200	53.8		
No	7,205	46.2		
Four-year college qualified	13406	-	2.31	1.46
Not qualified	6200	46.3		
Minimally qualified	1941	14.5		
Somewhat qualified	1771	13.2		
Very qualified	1940	14.5		
Highly qualified	1554	11.6		
High school graduate				
Yes	13,128	88.0		
No	1,783	12.0		
Information Sources on Financial Aid	11,842	-	2.23	1.68

Note: Cases were weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (n= 199.02) to minimize the effect of large sample sizes on standard errors.

Table III. 2. Descriptive statistics for the variables employed in the logistic regression models (continues)

Variable	N	% Cell	Mean	S.D.
Applied to a 4-year institution				
Yes	9,585	64.3	-	-
No	5,320	35.7	-	-
Highest parental expectations				
No PSE or unsure	1,421	11.8		
Some college	1,868	15.5		
Bachelor's	4,609	38.4		
Advanced degree (MS/PhD/Prof)	4,114	34.2		
Educational expectations in 1992				
No PSE expectations				
Some College	2,190	15.3		
Bachelor's	3,789	26.4		
Advanced degree (MS/PhD/Prof)	4,377	30.5		
	3,992	27.8		
Planned ever to attend PSE				
No PSE				
2-yr, or trade school	503	4.1		
4-yr college	4,583	37.3		
	7,210	58.6		
High School based support				
College application				
Financial aid application				

Note: Cases were weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (n= 199.02) to minimize the effect of large sample sizes on standard errors.

Appendix IV

A methodological note on logistic regression

Logistic regression is an ideal method to model the effect of independent variables when the dependent variable under consideration is dichotomous. Logistic regression not only captures the probabilistic distribution embedded in dichotomized measures, but it avoids violations to the assumption of homogeneity of variance and functional specification the direct application of Ordinary Least Squares (OLS) regression models are likely to produce (Aldrich & Nelson, 1986; Cabrera, 1994). Moreover, Press and Wilson (1978) proved the superiority of logistic regression for classification and prediction purposes in relation to discriminant analyses.

Interpretation of results

Baseline p. Observed probability in the dependent variable. For instance, the observed probability that lowest-SES 8th graders would meet minimal college-qualifications by 12th grade is .286; or 28.6 of them got qualified. Observed probabilities are also referred as "unadjusted probabilities". Baseline *p* serves as a benchmark to assist in assessing how much each independent variable contributes to the probability of the dependent variable.

Beta weights. In contrast to OLS, interpretation of logistic parameter estimates is not straightforward. Unlike OLS, the metric of individual coefficients is expressed in terms of logits rather than in terms of the original scale of measurement. This problem is particularly accentuated for categorical variables since the corresponding beta weights represent contrasts among categories summarized in terms of differences of logits. For instance, the gender effect of .106 displayed in table IV.1 indicates that women, on the average, are .106 logit units more likely to secure minimal college qualifications by 12th grade than are males. To overcome this problem, logistic regression results are usually presented in terms of changes in probabilities and adjusted probabilities.

Delta-p. Developed by Peterson (1985), delta-*p* reflects the incremental change in the dependent variable (e.g., meeting minimal college qualifications) due to a unit change in the independent variable (e.g. parental involvement). In table 8, for instance, the delta-*p* value of .181 associated with parental involvement means that for every unit increase in parental involvement the probability that the 8th grader would secure minimal college qualifications by the 12th increases by 18.1 percent. When the independent variable is a dichotomy (e.g. gender), delta-*ps* are interpreted as differences between the two categories. In table 8, for instance, the delta-*p* of .026 associated with Female, means that females are 2.6 percent points more likely to become college qualified by the 12th grade than they male counterparts.

Adjusted probabilities. Used to estimate corrected probabilities by holding constant the dependent variables at their mean value (Cabrera, 1994; Menard, 1995). Adjusted probabilities, then, control for factors that systematically affect a group in a

consistent manner (Bowen & Bok, 1998). Take the case of high school completion among lowest-SES students. At the aggregate, Lowest-SES 8th graders graduate from high school at considerably lower rates than Upper-SES graders (73.3% vs 98.0%), signifying a strong socioeconomic status effect. This SES-size effect all but disappears once background, parental involvement, ability, being at-risk and securing minimal college qualifications are held constant for both groups (90.4% vs 98.0%) see figure and table. In other words, the observed differences in probabilities of high school completion are more the product of at-risk factors that systematically are more present among lowest-SES students than are among upper-SES originated students. We calculated the adjusted probabilities using the mean values reported in Table III.2 and the logistic parameter estimates depicted in Tables IV.1 through IV.3 using the following formula (see Cabrera, 1994, p. 228).

$$P(Y) = \frac{\text{Exp}(B_0 + B_1 X_1)}{1 + \text{Exp}(B_0 + B_1 X_1)}$$

X^2 for the model. Assesses whether the independent variables as a group are significantly associated with the dependent variable (Aldrich & Nelson, 1987).

Proportion of Correctly Predicted cases (PCP). Provides an overall indicator of fit of the logistic regression model paralleling the OLS proportion of variance explained with R^2 . This measure involves a comparison between the number of cases that the model predicted as being either 0 (not minimally college qualified) or 1 (being college qualified) against the total sample size. PCP values greater than 55% signify a good fit of the model (see Cabrera, 1994).

Table IV.1. Effects of background, having planned for college at 8th grade, parental involvement, ability at 8th grade and being at-risk on the probability of securing at least minimal college qualifications by 12th grade.

Factor	All	Socioeconomic Status			
		Lowest	Middle Lowest	Middle Upper	Upper
Second Lowest-SES	-0.062	-	-	-	-
Upper Middle SES	0.236**	-	-	-	-
Upper SES	0.618***	-	-	-	-
Female	0.106	0.101	0.196	0.132	-0.012
Hispanic	0.056	0.136	0.269	0.073	-0.438
African American	0.055	0.351	0.185	0.179	-0.817***
Asian American	0.556***	0.647	0.504	1.011**	0.193
Planned for college at 8 th grade	0.725***	0.538***	0.782***	0.868***	0.819***
Parental involvement	0.788***	0.659***	0.638***	0.601***	1.423***
Ability at 8 th grade	0.119***	0.118***	0.124***	0.124***	0.116***
At-risk factors at 8 th grade	-0.443***	-0.459***	-0.487***	-0.503***	-0.304***
Intercept	-6.814***	-6.589***	-6.925***	-6.501***	-8.063***
Number of cases	8,808	1,896	2,130	2,298	2,484
Baseline <i>p</i>	0.537	0.286	0.454	0.589	0.796
Model X^2 , <i>df</i>	4,078,11***	526.44,8***	879.87,8***	881.89,8***	653.93,8***
PCP	78.9%	75.6%	75.3%	77.7%	85.6%

Note: Each case was weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (average weight = 199.02) to minimize the effect of large sample sizes on standard errors. Delta-*p* represents the change in the probability of securing at least minimal college qualifications due to a unit change in the factor variable under consideration. PCP represents the percent of cases correctly predicted by the model. PCPs higher than 55% signify a good fit for the model (see Cabrera, 1994).

Table IV.2. Effects of background, having planned for college at 8th grade, parental involvement, ability at 8th grade, being at-risk and securing at least minimal college qualifications on the probability of graduating from high school.

Factor	All	Socioeconomic Status			
		Lowest	Middle Lowest	Middle Upper	Upper
Second Lowest-SES	0.093	-	-	-	-
Upper Middle SES	0.677**	-	-	-	-
Upper SES	1.096***	-	-	-	-
Female	-0.283**	-0.197	-0.135	-0.887**	-0.061
Hispanic	0.197	0.831***	0.056	-1.419***	0.344
African American	-0.020	0.535**	-0.583*	-0.241	1.869
Asian American	0.386	0.417	0.261	0.389	0.850
Planned for college at 8 th grade	0.250*	0.017	0.747***	-0.178	-0.037
Parental involvement	0.635***	0.541**	0.050	1.858***	1.252*
Ability at 8 th grade	0.069***	0.058***	0.066***	0.106***	0.051
At-risk factors at 8 th grade	-0.381***	-0.258**	-0.584***	-0.320**	-0.217
College qualified	3.090***	3.469**	3.208***	2.558***	2.864***
Intercept	-0.047	-1.604	-0.487	-5.495***	-0.858
Number of cases	8,807	1,896	2,130	2,298	2,483
Baseline <i>p</i>	0.881	0.733	0.863	0.939	0.980
Model X^2 , <i>df</i>	1459.45,12***	327.08,9***	448.34,9***	256.13,9***	80.45,9***
PCP	93.9%	85.4%	92.2%	96.9%	99.1%

Note: Each case was weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (average weight = 199.02) to minimize the effect of large sample sizes on standard errors. Delta-*p* represents the change in the probability of securing at least minimal college qualifications due to a unit change in the factor variable under consideration. PCP represents the percent of cases correctly predicted by the model. PCPs higher than 55% signify a good fit for the model (see Cabrera, 1994).

Table IV.3 Logistic regression results for predicting probability of applying to college among 12th graders due to background, at-risk factors, parental involvement, parental educational expectations, college-qualifications, information & resources, and degree aspirations.

Factor	All	Socioeconomic Status			
		Lowest	Middle Lowest	Middle Upper	Upper
Second Lowest-SES	.079	-	-	-	-
Upper Middle SES	.586***	-	-	-	-
Upper SES	1.132***	-	-	-	-
Female	-.036	-.158	.166	.077	-.271
Hispanic	-.001	.516*	-.542	-.307	.050
African American	.504***	.558*	.540*	1.017***	.028
Asian American	.506**	.835	.813	.455	.146
Risk factors	-.266***	-.341***	-.347***	-.117	-.324***
Parental involvement	.289***	-.187	.593***	.212	.351
Parent expected some college	-.008	.055	-.159	-.255	.694
Parent expected bachelor's	1.086***	1.098**	1.172***	.982***	1.326***
Parent expected advanced degree	.912***	.835**	.872***	.800***	1.329***
College-qualifications	.566***	.620***	.572***	.533***	.580***
Information on Financial Aid	.202***	.294***	.275***	.202***	.088
Help in college application	.457***	.362	.383*	.703***	.290
Help in financial aid procedures	.117	.129	.121	.071	.152
Help in college essays	.323***	.327	.300	.189	.434**
Aspired for some college	-.056	.047	.049	-.215	-.214
Aspired for a Bachelor's	1.195***	1.382***	1.237***	1.135***	.985
Aspired for advanced degree	1.536***	1.718***	1.385***	1.399***	1.637***
Intercept	-2.087***	-1.797***	-3.237***	-1.827***	-1.446***
Number of cases	7,417	1,393	1,732	2,022	2,270
Baseline <i>p</i>	.467	.213	.342	.537	.755
Model X^2 , df	44422.51,20***	666.15,17***	1,031.06,17***	1,014.28,17***	791.78,17***
PCP	82.8%	82.8%	81.0%	80.4%	87.0%

Note: Each case was weighted by the NCES panel weight F3PNLWT divided by the average weight for the sample (average weight = 199.02) to minimize the effect of large sample sizes on standard errors. Delta-*p* represents the change in the probability of securing at least minimal college qualifications due to a unit change in the factor variable under consideration. PCP represents the percent of cases correctly predicted by the model. PCPs higher than 55% signify a good fit for the model (see Cabrera, 1994).

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