



U.S. Department of Education
Institute of Education Sciences
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The Adult Lives of At-Risk Students

The Roles of Attainment and Engagement in High School

Statistical Analysis Report



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March 2006

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Executive Summary

This report examines heterogeneity in young adult outcomes among students at risk for school failure due to low socioeconomic status (SES). It addresses the question: “Among students at risk due to status characteristics, what are the relationships of high school engagement and attainments with post-high school outcomes?” Two sets of outcomes are considered: entry and persistence in postsecondary education, and employment and income as a young adult.

The report distinguishes between “status risk factors” such as SES and race/ethnicity and two other sets of risk factors: behavioral risk factors and academic risk factors. Behavioral risk factors are behaviors and attitudes closely related to learning, for example, attendance, paying attention to the teacher, completing coursework, and developing a sense that schooling is important to future life successes. These behaviors and attitudes are referred to as school engagement. “Disengagement” (e.g., not attending class, not completing assignments) can create severe impediments to learning.

Academic risk factors are less-than-successful outcomes at one point in a school career that can interfere with the chances of success at later stages. In this report, high school grades, test scores, and graduation are viewed as high school attainments which, if not adequate, become risk factors with respect to further schooling and employment. These outcomes were used to classify the sample into one of three high school attainment groups. Bivariate and multivariate analyses examined the relationships among behavioral risk (engagement/disengagement), academic risk (high school attainments), and post-high school outcomes in the sample of status risk students.

The National Education Longitudinal Survey of 1988 (NELS:88) survey conducted by the National Center for Education Statistics (NCES) provided a rich dataset for addressing these issues. It followed a national sample of eighth grade students longitudinally until they were 8 years beyond high school age; it collected extensive information on participants at three points during secondary school (when most students were in eighth, tenth, and twelfth grades); and it collected information about participants’ postsecondary activities including civic participation, further schooling, and employment, at two further time points. In the course of the five-wave survey, high school dropouts were also identified and followed through young adulthood.

The Sample: Status Risk Students

In all, 3,502 eighth-grade NELS:88 students were identified who were at risk for educational failure according to “status risk characteristics,” namely, the socioeconomic status of the students’ home¹ and of the school attended.² Students in the sample were those who

¹ NELS:88 composite variable BYSES, constructed from parents’ reports of their education, occupations, and household income. In some cases, the information was drawn from other sources.

² Percentage of students eligible for free or reduced-price lunches.

participated in all five waves of data collection and whose families and schools were both in the lower halves of the respective SES distributions. Approximately one-third (33 percent) of the five-wave cohort of 10,827 students was at risk by these criteria. Compared to students not at risk, status risk students were disproportionately minority (44 percent compared to 20 percent),³ attended urban and rural public schools (71 percent compared to 49 percent), were from non-English-speaking homes (20 percent compared to 9 percent), and not living with both biological parents (44 percent compared to 28 percent).

Three Attainment Groups/Academic Risk

Students were classified into one of three groups based on test scores, grades, and graduation status—successful completers, marginal completers, and noncompleters. Successful completers (21 percent) received acceptable grades in tenth grade,⁴ attained reasonable scores on reading and mathematics standardized achievement tests in eighth and tenth grades,⁵ and graduated on time from high school. Modest achievement criteria were used on the assumption that these represent noteworthy accomplishments for students with multiple risk factors. Nevertheless, approximately one in five students at risk due to a low-SES home and low-SES school passed their courses, received acceptable test scores, and graduated from high school on time.

An additional 52 percent of status risk students were classified as marginal completers. Either their self-reported grade point average fell below the criterion of acceptability, their test scores fell below the cutoff for success used in the analysis, or both. All marginal completers graduated from high school,⁶ despite receiving lower grades and/or test scores.

The remaining 27 percent of status risk students left high school without graduating, and were referred to as noncompleters. They were viewed as being at high academic risk with respect to further endeavors.

Attainment groups were compared to see if academic risk was related systematically to postsecondary education and employment. The specific outcomes were

- entering a postsecondary program of study;
- the number of credits accrued, for those who entered postsecondary education;
- attaining a postsecondary certificate or degree, for those who entered;
- being employed at the time of the fourth NELS:88 follow-up in year 2000;⁷
- an index of consistent employment during 1997–1999; and
- annual income in 1999, for those who were employed.

³ Asian/Pacific Islander students were the only minority group to constitute a greater percentage of non-risk students than of at-risk students.

⁴ Grade point average of “about half B’s and half C’s” or better, according to student report of grades.

⁵ One-fourth of a standard deviation below the mean ($\bar{X} - 1/4 S$) in reading/mathematics in eighth and tenth grades, or better; also used in Finn and Rock (1997).

⁶ Graduated on time (90 percent), or else by the time of the third NELS:88 follow-up (1994).

⁷ Most participants were 26 years of age.

Behavioral Risk: School Engagement/Disengagement

Engagement in school is “the attention, interest, investment, and effort students expend in the work of school” (Marks 2000, p. 155). Status risk students were scored on four measures of engagement, based on theory and prior research (e.g., Finn 1989, 1993; Rumberger and Larson 1998; Wehlage et al. 1989; Voelkl 1997). They included three measures of behavioral engagement, constructed from the NELS:88 student and teacher questionnaires in tenth grade: a composite measure of absenteeism and tardiness, a composite measure of the student’s participation in learning activities, and a count of extracurricular activities in which the student participated. A fourth measure, indicative of affective engagement, was the student’s perceptions of the usefulness of school subjects in endeavors outside of school. This indicator was formed from questions about the utility of four school subjects, asked in the eighth-grade student questionnaire.

The connections of school engagement/disengagement with postsecondary education and employment were examined to determine: (1) if behavioral risk is systematically related to postsecondary education and employment of young adults at risk due to status characteristics, and (2) if behavioral risk is related to postsecondary education and employment, above and beyond the effects of school attainments (academic risk).⁸

The Analyses

The relationships of attainment groups and engagement with postsecondary education and employment were first examined one variable at a time. Next, multivariate regression and logistic regression analyses were conducted that included other characteristics of the students and schools (i.e., student gender, race/ethnicity, school urbanicity). Each measure of postsecondary schooling (entering, accruing credits, completing a program of study) and each measure of employment (current employment, consistent employment, income) was considered in turn. In the analysis of postsecondary education, the type of program entered (less-than-2-year, 2-year, 4-year) was also included in the analysis. In the analysis of employment outcomes, completing a postsecondary program of study was also included in the regressions.

All statistical significance tests carry with them the possibility of error. Results found to be “statistically significant” may appear significant in the sample under study, but may not replicate in other samples drawn from the larger population. The usual practice is to limit the probability of this type of error (called a type I error) to a small value before interpreting the statistical outcomes. In this analysis, the probability of a type I error was set at .05.⁹

Tests of significance reveal whether a relationship between variables is statistically reliable, but tell little about whether effects are weak or strong. Thus, strength-of-effect measures were obtained from the regressions for all statistically significant effects. Particular

⁸ The same six outcomes were examined as in the attainment group analysis (listed on the preceding page).

⁹ Of the many statistical tests presented in the report, it can be expected that approximately 5 percent that appear significant do not represent real nonzero differences; unfortunately, it is not possible to identify which tests those may be.

strength-of-effect measures (odds ratios, effect sizes, or standardized regression weights) were used depending on the measurement scales involved.

Academic Risk: High School Attainments and Young Adult Outcomes

A number of differences were found among attainment groups. In all, 61 percent of participants attended some form of postsecondary schooling, but this included 83 percent of successful completers, 68 percent of marginal completers, and 29 percent of noncompleters (see table A). Almost half of successful completers entered a 4-year college or university (48 percent of all successful completers), while a 2-year school was the most common choice for marginal completers and noncompleters (43 percent and 22 percent of all marginal completers and noncompleters, respectively).

Persistence in postsecondary schooling, in the form of accruing credits and completing a program of study, differed among the three attainment groups. High school noncompleters, with the highest level of academic risk, stood out in each case. Noncompleters earned the fewest credits of the three groups;¹⁰ the mean number of credits earned by noncompleters who entered a postsecondary program was 17.0, compared to 49.4 credits for marginal completers and 87.8 credits for successful completers. Noncompleters also had the lowest completion rates. Of status-risk students who entered postsecondary schooling, 35 percent of noncompleters finished a program of study, compared to 44 percent of marginal completers and 58 percent of successful completers.

Eighty-four percent of status risk students were employed for pay in 2000. The percentage was lower for high school noncompleters (77 percent) than for successful completers (88 percent) or marginal completers (86 percent). Likewise, noncompleters were less likely than successful completers or marginal completers to have consistent employment over a 3-year period; the mean consistent employment index for noncompleters was 2.2, compared to 2.5 for marginal completers and 2.6 for successful completers (on a scale from 0.0 to 3.0).

As postsecondary education increased, the differences among the groups in consistent employment diminished. Specifically, among status risk students who did not enter postsecondary education, successful completers had more consistent employment than did marginal completers, and marginal completers had more consistent employment than did noncompleters; the mean consistent employment index for noncompleters with no postsecondary education was 2.2, compared to 2.5 for marginal completers and 2.7 for successful completers. Among students who completed postsecondary programs of study, there were no discernable differences among the attainment groups in consistent employment.

The Regression Analyses. Multivariate regression and logistic regression analyses were conducted to examine the relationship of academic risk with post-high school outcomes in a fuller context. The regressions included student and school characteristics in the analysis together with attainment groups. Separate regressions were performed for each outcome variable (entering postsecondary education, accruing credits, and completing a program of study; and current employment, consistent employment, and salary).

¹⁰ Type of institution entered was taken into account in this analysis.

High School Attainment and Postsecondary Education. In each analysis, successful completers showed clear advantages over marginal completers and marginal completers showed advantages over noncompleters. Marginal completers, who graduated from high school despite their modest academic performance, had over five times the odds of entering a postsecondary program. Of those who entered postsecondary programs, marginal completers earned more credits than did noncompleters by approximately one-half (0.55) standard deviation, and were about one and two-thirds times more likely to complete a program of study they entered.¹¹ Noncompleters, who were at the highest level of academic risk, had the poorest outcomes on all three postsecondary attainments.

Table A. High school attainment groups of status risk students, by postsecondary education and employment/income outcomes: 2000

Outcome	High school attainment group		
	Successful completers ¹	Marginal completers ²	Noncompleters ³
Percent of status risk students	21.3	51.6	27.1
Percent who entered a postsecondary institution ⁴	83.3	67.6	29.2
< 2-year school	1.7 !	6.0	5.0
2-year school	33.3	42.6	21.6
4-year school	48.3	18.9	2.7 !
Mean credits earned in postsecondary institutions ^{5,6,7}	87.8	49.4	17.0
Percent completed postsecondary education ⁶	57.6	44.2	35.0
Percent currently employed (2000)	88.3	86.1	76.7
Consistent employment mean 1997–1999 ⁸	2.62	2.51	2.24

! Interpret data with caution. Unweighted $n < 30$.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Classified by type of first institution attended. Percentages based on total number of successful completers, marginal completers, and noncompleters in status risk sample.

⁵Credits earned from all schools attended.

⁶Percentage based on total number of successful completers, marginal completers, and noncompleters who entered postsecondary education.

⁷Response rate on this variable less than 85 percent.

⁸0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.

NOTE: Standard errors are given in appendix B, table B-A.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

¹¹ These regressions included the type of institution entered.

High School Attainment and Adult Employment/Income. There were no discernable differences among attainment groups in current employment or income at age 26 when the analyses included student demographics and postsecondary schooling. A small difference was found in consistent employment between marginal completers and noncompleters.¹² Not graduating from high school was accompanied by less consistent employment over a 3-year period.

The analyses for employment were repeated excluding the postsecondary education variable. In these analyses, attainment groups differed with respect to current employment, consistent employment, and income. It appears that the relationship between high school attainment and employment and income is attributable in whole or in part to postsecondary schooling.¹³ Successful completers more than marginal completers, and marginal completers more than noncompleters, enter postsecondary schooling and subsequently are more likely to be employed and have higher incomes as young adults.

Behavioral Risk: School Engagement/Disengagement and Young Adult Outcomes

Behavioral risk was represented by four measures of school engagement/disengagement: attendance, classroom behavior, extracurricular participation, and students' perceptions of the usefulness of school subjects. On three of the four measures (all except usefulness), successful completers were more engaged than were marginal completers and marginal completers were more engaged than were noncompleters. Noncompleters—students with the highest level of academic risk—were also the least engaged. Differences among the attainment groups in attendance and classroom behavior were moderate to large (effect sizes from 0.40 to 0.82 standard deviations).

Several engagement variables were significantly correlated with postsecondary schooling. Attendance and classroom behavior were related to entering a postsecondary program, earning postsecondary credits, and completing a program of study, with correlations ranging from 0.13 to 0.28. Extracurricular participation was related to all three postsecondary variables, but the correlations were small (from 0.08 to 0.18). The perceived usefulness of school subjects was related weakly to credits earned in postsecondary school ($r = 0.09$), but not to entering or completing a postsecondary program.

Attendance was related to current employment, consistent employment, and income for the total sample, but the correlations were also small (0.08 to 0.13). Neither classroom behavior nor extracurricular participation was measurably related to any of the three key employment/income measures. The usefulness of school subjects was negatively related to consistent employment for some subgroups of students (correlations of -0.09 and -0.20).

In general, behavioral risk, in the form of school engagement/disengagement, was related to measures of postsecondary education and related weakly, if at all, to employment and income. These relationships were examined in a fuller context in the regression analyses.

¹² Approximately one-fourth (0.27) of a standard deviation.

¹³ The one outcome not attributable to postsecondary schooling is the relationship of high school noncompletion with consistent employment, which remained significant even with postsecondary education in the regressions.

The Regression Analyses. The relationship of behavioral risk with postsecondary education and employment was tested in regressions and logistic regressions with other characteristics of the students and schools also included in the analysis (i.e., student gender, race/ethnicity, school urbanicity, and, for employment outcomes, the amount of postsecondary education completed). Separate regressions were performed for each outcome variable (three indicators of postsecondary education and three indicators of employment/income).

Engagement and Postsecondary Education. School engagement was related to all three postsecondary outcomes (entering a postsecondary program, accruing credits, and completing a program of study) when student and school background characteristics were included in the model. Attendance and classroom behavior had the most consistent relationships with postsecondary schooling. Both were associated with an increase in the likelihood of entering a postsecondary program,¹⁴ and in credits earned and the likelihood of completing a program among those who entered.¹⁵ Poor attendance and classroom behavior (disengagement) were associated with reduced postsecondary outcomes in each case.

Participation in extracurricular activities was positively related to the likelihood of entering a postsecondary program.¹⁶ No relationship was detected between extracurricular activities and persistence in postsecondary schooling, however, as reflected in credits earned or program completion. The perceived usefulness of school subjects, rated in eighth grade, was not measurably related to any postsecondary outcome.

Engagement and Employment/Income. As a set, the four engagement measures were related to current employment in 2000 and to consistent employment when other student and school characteristics were included in the analysis. Engagement was not discernably related to income. In terms of specific engagement variables, attendance was positively related to consistent employment,¹⁷ and classroom behavior was positively related to current employment.¹⁸ An analysis of interactions revealed that both relationships characterized some groups of status risk students more than others.

The perceived usefulness of school subjects was negatively related to current employment in 2000 and to consistent employment. The usefulness measure was unique in other ways: it was assessed in eighth grade, and, although the internal consistency of the measure was adequate,¹⁹ the correlations between usefulness and the other engagement measures were low,²⁰ and it was not significantly related to postsecondary schooling. Follow-up regressions were

¹⁴ Odds ratios = 1.23 for attendance and 1.54 for classroom behavior. For attendance, a 1 standard deviation improvement in attendance was associated with a 23 percent increase in the odds of entering a postsecondary school. This would be roughly the difference between two students, one of whom scores at about average on the absenteeism-tardiness index and one who scores at about the 25th percentile.

¹⁵ Standardized regression coefficients for credits earned were small (0.14 for attendance; 0.12 for classroom behavior). Odds ratios for program completion were 1.22 and 1.19, respectively.

¹⁶ Odds ratio for the full sample = 1.39. This relationship was strongest for non-Hispanic White students.

¹⁷ The standardized regression coefficient was small (0.08).

¹⁸ Odds ratio = 1.31.

¹⁹ Coefficient α = 0.71.

²⁰ Correlations from 0.05 to 0.11.

conducted omitting the usefulness scale. In these, there was no discernable relationship of the engagement measures with employment or income.

In sum, behavioral risk, as reflected in a set of four engagement measures, is related to employment in the years following high school, but the relationship was not found for all engagement measures, for all employment measures, or for all groups of students. The relationship was explored further in analyses that included both attainment groups and high school engagement.

Engagement Above and Beyond Attainment? A final set of analyses was conducted in which both high school attainment (academic risk) and engagement (behavioral risk) were included in the regressions. The purpose was to determine if the relationship of engagement and adult outcomes is attributable to the relationship of engagement with high school attainments, which in turn are related to later outcomes, or if engagement is related to post-high school accomplishments through other mechanisms not studied. Analyses were conducted with both postsecondary schooling and employment as outcomes.

Engagement was related to all three postsecondary education variables—entering a postsecondary program, the number of credits earned, and completing a postsecondary program—above and beyond its relationship with high school attainment. The same engagement variables were related to postsecondary schooling as in the analysis without attainment, although several specific relationships were reduced to nonsignificance. In the full engagement/attainment analysis, attendance was positively related to credits earned, classroom behavior was positively related to entering postsecondary education and credits earned, and extracurricular participation was positively related to entering a postsecondary program. Again, in each instance, disengagement was associated with poorer postsecondary outcomes.

Engagement was not discernably related to any of the employment/income measures at age 26 when attainment groups were included in the analysis.

Conclusions

This report supports three general conclusions: First, among students at risk due to status risk factors, there is diversity in high school accomplishments and in post-high school years in terms of further education and employment and income. Many status students at risk enter postsecondary programs (61%), and about one-half of those complete postsecondary studies (47%) including 2-year programs and 4-year programs leading to BA degrees; many are employed for pay at age 26 (84%) and/or maintain consistent employment as young adults.

Second, academic risk factors, that is, less-than-successful outcomes in high school, are related to the likelihood of attaining further education and consistent employment as young adults. Among status risk students, attaining reasonable test scores, passing grades, and graduating from high school are associated with greater higher postsecondary attainments. High school noncompleters were least likely to enter or persist in postsecondary schooling, and were less likely than graduates to have sustained employment over a 3-year period.

Third, behavioral risk factors, in the form of engagement/disengagement in high school, are related to postsecondary schooling among status risk students. Among status risk students, coming to class on time, attending classes regularly, working hard in class, and completing assignments were related to the likelihood of entering a postsecondary program and earning postsecondary credits. Extracurricular participation in high school was also related to entering a postsecondary program. Status risk students who were the least engaged in these ways (disengaged) were less likely to enter or persist in a postsecondary program of study.

Limitations

NELS:88 provided a particularly rich data set for this analysis. Nevertheless, certain design features limit the strength of the conclusions that can be drawn.²¹ First, a broad-based survey such as NELS:88 is designed to serve many purposes but may not address particular questions in depth. In this analysis, the measures of school engagement assessed key aspects of the construct discussed in previous research (Finn 1993; Marks 2000; Connell, Spencer, and Aber 1994). However, the affective component of engagement was represented by a single measure (usefulness of school subjects), assessed in eighth grade. The internal consistency of the measure was adequate, but a broader spectrum of affective measures, assessed later in the high school years, would have been desirable. Conclusions about school engagement are limited to the four aspects of engagement that could be assessed using NELS:88 data.

Second, many of the NELS:88 measures are based on participants' self-reports. The potential biases in self-report data are recognized widely (Tanur 1992; Paulhus 1991). In a survey similar to NELS:88 in many ways, researchers found that the correlations of self-reports with factual data (e.g., school grades) were highest, but tended to decrease with the passage of time (Fetter, Stowe, and Owings 1984). The correlations with less factual information (e.g., parents' aspirations for students) were somewhat lower. In the analyses reported here, every attempt was made to use the most objective data available for each measure.

In some instances, this principle resulted in reduced sample sizes for particular variables.²² Specifically, the number of credits earned in postsecondary education was taken from college transcripts, but was available only for 85 percent of those who entered postsecondary programs. Teachers' ratings of student attendance and classroom behavior were only available for 87 percent of the eligible students.²³ In all analyses, cases missing a value were omitted from the analysis of that particular variable. As a result, a degree of reporting bias may confound some of the statistical relationships given in this report.

Third, NELS:88 did not involve any experimental intervention. Although it is desirable to know if high school attainments or engagement is causally connected to adult outcomes, survey methodology only provides a conclusion that events do or do not occur in the same individuals.

²¹ More detailed technical issues are discussed in appendix A, for example, incomplete data on some variables.

²² See table A-1 in appendix A for response rates.

²³ That is, those still in school at the time of the ratings.

Further, in analyzing nonexperimental data, there is always the possibility of bias in the results due to “specification error,” that is, the omission of important variables from the regressions. For example, the analysis controlled home background to some extent by excluding all students but those from low-SES homes, and by including race/ethnicity and urbanicity in the regressions. Specific home processes that may vary within the group of low-SES families were not considered. Likewise, school policies and practices that may affect student engagement and attainment were not examined in these analyses. The results should be viewed within the constraints imposed by this limitation.

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Contents

Executive Summary	iii
The Sample: Status Risk Students.....	iii
The Analyses.....	v
Conclusions.....	x
Limitations.....	xi
 Acknowledgments	 xiii
 Contents	 xv
 Tables	 xvii
 1. Introduction	 1
Status Risk Factors and School Outcomes.....	1
Status Risk Factors and Post-High School Outcomes.....	4
Behavioral Risk Factors: Engagement/Disengagement in School.....	8
Overview of This Report.....	11
 2. Data Source and Methods of Analysis	 15
Participants in the Analysis.....	16
Variables.....	17
Data Analysis.....	22
 3. High School Attainments and Young Adult Outcomes	 27
Status Risk and Non-Status Risk Students.....	27
Status Risk Students.....	30
 4. Behavioral Risk: School Engagement/Disengagement and Young Adult Outcomes	 47
Engagement/Disengagement and Attainment Groups.....	47
Engagement/Disengagement and Adult Outcomes.....	49
 5. Summary of Results	 67
Academic Risk and Young Adult Outcomes.....	68
Behavioral Risk and Young Adult Outcomes.....	69
 References	 71
 Appendixes	
Appendix A.....	A-1
Appendix B.....	B-1
Appendix C.....	C-1
Appendix D.....	D-1

Tables

Executive Summary and Chapters

Table		Page
A	High school attainment groups of status risk students, by postsecondary education and employment/income outcomes: 2000.....	vii
1	Status risk sample, by demographic characteristics: 1988.....	17
2	Percentage distribution of status risk sample and non-status risk students, by selected demographic and school characteristics: 1988.....	28
3	Status risk sample and non-status risk students, by selected home-related characteristics: 1988.....	29
4	Percentage distribution of status risk students in each attainment group, by gender and race/ethnicity: 1988.....	31
5	High school attainment groups of status risk students, by postsecondary education outcomes: 2000.....	32
6	High school attainment groups of status risk students, by employment/income outcomes: 2000.....	35
7	Regression results for high school attainment groups and postsecondary education outcomes: 2000.....	37
8	Strength-of-effect measures for high school attainment groups and postsecondary education outcomes: 2000.....	39
9	Regression results for high school attainment groups and employment/income outcomes: 2000.....	42
10	Strength-of-effect measures for high school attainment groups and employment/income outcomes: 2000.....	44
11	Mean engagement measures of high school attainment groups: 1990.....	48
12	Correlations of engagement measures with postsecondary education and employment/income outcomes: 2000.....	50
13	Regression results for engagement and postsecondary education outcomes: 2000.....	52
14	Strength-of-effect measures for engagement and postsecondary education outcomes: 2000.....	54
15	Regression results for engagement and employment/income outcomes: 2000.....	57
16	Strength-of-effect measures for engagement and employment/income outcomes: 2000.....	60
17	Strength-of-effect measures for postsecondary education outcomes, by engagement factors and attainment groups: 2000.....	63
18	Strength-of-effect measures for employment/income outcomes, by engagement factors and attainment groups: 2000.....	64
19	Summary of regression analyses of school attainment and of school engagement on postsecondary education and employment/income: 2000.....	68

Appendix A Table

A-1 Response rates of variables used in descriptive or regression Analyses..... A-7

Appendix B Tables

B-A Standard errors for table A: High school attainment groups of status risk students, by postsecondary education and employment/income outcomes:2000..... B-1

B-1 Standard errors for table 1: Status risk sample, by demographic characteristics: 1988..... B-2

B-2 Standard errors for table 2: Percentage distribution of status risk and non-status risk students, by selected demographic and school characteristics: 1988..... B-3

B-3 Standard errors for table 3: Status risk sample and non-risk students, by selected home-related characteristics: 1988..... B-4

B-4 Standard errors for table 4: Percentage distribution of status risk students in each attainment group, by gender and race/ethnicity: 1988..... B-5

B-5 Standard errors for table 5: High school attainment groups of status risk students, by postsecondary education outcomes: 2000..... B-6

B-6 Standard errors for table 6: High school attainment groups of status risk students, by employment/income outcomes: 2000..... B-7

B-7 Standard errors for table 11: Mean engagement measures of high school attainment groups: 1990..... B-8

Appendix C Tables

C-1 Unweighted sample sizes of attainment groups, by demographic characteristics: 1988..... C-1

C-2 Strength-of-effect measures for table 5: High school attainment groups, by postsecondary education outcomes: 2000..... C-2

C-3 Strength-of-effect measures for table 6: High school attainment groups, by employment/income outcomes: 2000..... C-3

C-4 Strength-of-effect measures for table 11: Mean engagement measures of high school attainment groups: 1990..... C-4

C-5 Regression results for postsecondary education outcomes by engagement factors and attainment groups: 2000..... C-5

C-6 Regression results for employment/income outcomes, by engagement factors and attainment groups: 2000..... C-6

Appendix D Table

D-1 Variables Used in This Report..... D-2

1. Introduction

The purpose of this report is to examine variation in outcomes among students at risk for school failure. The report addresses the question: “Among students at risk due to low socioeconomic status (SES), what are the relationships of high school engagement and attainments with post-high school outcomes?” Two sets of outcomes are considered: entry and persistence in postsecondary education, and employment and income as a young adult.

Educational risk can be defined in terms of demographic or historical characteristics associated with an increased likelihood of adverse outcomes. These “status risk factors” include being a minority student, coming from a low-income home, or coming from a home in which English is not the primary language (Braswell et al. 2001; Grigg et al. 2003; Kaufman, Alt, and Chapman 2001; Persky, Daane, and Jin 2003). This report examines family SES (comprising parents’ education, parents’ occupations, and household income) and school SES (percent of students from low-income homes) as status characteristics associated with low grades, poor test scores, and leaving school without graduating.

Risk has also been defined in terms of “behavioral risk factors” that create further impediments to learning.¹ These behaviors may include skipping classes or school, failing to pay attention to the teacher or to complete required coursework, and failing to develop a sense that schooling is important to future life success. In their positive forms (good attendance, completing coursework, positive attitudes, participation in the broader school environment), this cluster of behaviors has been referred to as engagement in school, and in their negative forms as disengagement (e.g., Finn and Rock 1997; Marks 2000; National Research Council and Institute of Medicine 2004; Rumberger and Larson 1998; Wehlage et al. 1989). This report examines the relationship of engagement/disengagement in high school to grades, test scores, and graduation, and to postsecondary education, employment, and income.

A third set of risk factors is also examined in this report. “Academic risk factors”² are less-than-successful outcomes at one point in a school career that can interfere with chances of success at later stages. The academic risk factors considered in this report are accruing a history of poor grades, low test scores, and leaving high school without graduating. These are examined as possible antecedents of school- and work-related difficulties in post-high school years.

Status Risk Factors and School Outcomes

Research shows that students’ economic status is associated with the likelihood of success in school. Whether measured directly by parents’ income or by characteristics such as parents’ occupations or the number of wage earners, students from low-income families are less

¹ The distinction between status and behavioral risk factors is used in both educational and medical contexts (see Finn 1993).

² A phrase first used by Croninger and Lee (2001).

likely to obtain high grades and test scores, less likely to graduate with their entering class, and more likely to experience behavior problems than are students from higher-income families.

For example, assessments of student performance in reading, writing, and mathematics conducted by the National Assessment of Educational Progress (NAEP) all show this pattern. Using free-lunch eligibility as an indicator of household income,³ 40 percent of free-lunch eighth-grade students scored “at or above basic” in mathematics in 2000, compared to 76 percent of non-free-lunch students (Braswell et al. 2001). The percentages of students “at or above proficient” were 10 percent and 35 percent, respectively. The 2002 NAEP reading assessment reported that 60 percent of free-lunch eighth-grade students scored “at or above basic,” compared to 84 percent of non-free lunch students (Grigg et al. 2003). The percentages of students “at or above proficient” were 17 percent and 40 percent, respectively. And the 2002 NAEP writing assessment reported that 74 percent of free-lunch eighth-grade students scored “at or above basic,” compared to 91 percent of non-free lunch students (Persky, Daane, and Jin 2003). The percentages of students “at or above proficient” were 16 percent and 39 percent, respectively.

A noteworthy feature of this difference is its pervasiveness. Similar achievement gaps are reported at every grade, at all performance levels, and for every subject in each NAEP assessment wave that collected free-lunch data. Although the relationship of income with academic achievement fluctuates slightly over time, the basic finding of poorer performance by low-income students remains (Braswell et al. 2001; Grigg et al. 2003; National Center for Education Statistics 2003; Persky, Daane, and Jin 2003).

Family income is also related to high school completion. In 2000, young adults in families with incomes in the lowest 20 percent of all family incomes were six times more likely than those from families in the top 20 percent of income to have dropped out of high school (Kaufman, Alt, and Chapman 2001). Ten percent (10 percent) of students from families in the lowest one-fifth of the income distribution dropped out of high school compared with 5 percent in the middle of the income distribution and 1.6 percent of students from families in the top two-fifths. These findings are corroborated by statistics from communities with dropout rates above the national average. For example, a study of school children in Baltimore (Alexander, Entwisle, and Kabbani 2001) found that 60 percent of school children from families in the lower half of the income distribution left high school without a diploma, compared to 15 percent of those in the top quarter of the distribution.⁴ In Chicago, where over 85 percent of students are from low-income homes,⁵ the 2002 dropout rate was over two and one-half times greater than the statewide rate (Illinois State Board of Education 2002).

Economic disadvantage is more common among minority racial/ethnic groups, who are thus at increased risk for educational failure. The poverty rates for racial/ethnic groups in 2001 were White: 8 percent; Black: 23 percent; Hispanic: 21 percent; Asian/Pacific Islanders: 10 percent; and Native American/Alaska Natives: 25 percent (U.S. Department of Commerce 2002).

³ Eligibility for the U.S. Department of Agriculture’s National School Lunch Program is based on household income for a family, and depends on the number of members.

⁴ Based on the distribution in the Baltimore sample.

⁵ Low income was defined by a list of criteria including families receiving public aid, children otherwise supported by public funds, or children eligible to receive free or reduced-price school lunches.

These overall differences also characterize school-age populations. For example, in 2002, approximately 58 percent of Black eighth-grade students, 58 percent of Hispanic eighth-grade students, and 55 percent of Native American/Alaska Native eighth-grade students were eligible for free/reduced-price school lunches, compared to 31 percent of eighth-grade Asian/Pacific Islander students and 19 percent of White students (Grigg et al. 2003).

And, like income, race/ethnicity is related to achievement and school completion. In both grades 8 and 12, White students outperformed Black and Hispanic students on NAEP tests of reading, writing, and mathematics (Braswell et al. 2001; Grigg et al. 2003; Persky, Daane, and Jin 2003). The racial gaps persisted from 1990 through 2000 with few discernable changes in magnitude.

As a group, Asian/Pacific Islander students had NAEP scores that were as high as or higher than those of White students in all three subjects (Braswell et al. 2001; Grigg et al. 2003; Persky, Daane, and Jin 2003). In contrast, Native American/Alaska Native students have performed consistently below White and Asian/Pacific Islander students; their average performance was close to that of Hispanic students (Braswell et al. 2001; Grigg et al. 2003; Persky, Daane, and Jin 2003).

Dropout rates also differ by race/ethnicity. Over recent decades, the dropout rates for Black and Hispanic young adults have consistently been higher than those for Whites (Kaufman, Alt, and Chapman 2001). In 2000, 7 percent of Whites between ages 16 and 24 had not completed high school compared to 13 percent of Blacks and 28 percent of Hispanics. The high rate for Hispanics is attributable in part to the large number of Hispanic immigrants: over 44 percent of Hispanic young adults born outside of the U.S. had not completed high school. The dropout rate for Asian/Pacific Islander students was the lowest of all groups at 4 percent (Kaufman, Alt, and Chapman 2001).

School Characteristics and Academic Outcomes

Schools with high percentages of low-income or minority students also tend to have poor academic performance and high dropout rates. Title 1 participation, based on measures of poverty of the student body, is an indicator of economic status. According to recent NAEP assessments, in the eighth grade, 28 percent of students in Title 1 schools performed at the lowest level—below basic—on the writing assessment, compared to 12 percent of students in non-Title 1 schools (Persky, Daane, and Jin 2003). In reading, 45 percent of students in Title 1 schools performed below basic, compared to 20 percent of students in non-Title 1 schools (Grigg et al. 2003). In terms of dropout rates, studies show repeatedly that rates are higher in schools serving high percentages of minority students or those from low-income homes (e.g., Bryk and Thum 1989; Lippman, Burns, and McArthur 1996; McNeal 1997; Rumberger and Thomas 2000; Wiatrowski, Gottfredson, and Roberts 1983).

Schools with the most low-income students are often concentrated in urban communities. In 1999, the percentage of school-aged children living in poverty in the central cities of large and mid-size metropolitan areas were 24 percent and 20 percent, well above the overall poverty rate

of 16 percent⁶ (Wirt et al. 2003). Achievement and graduation rates are consistently lower in urban schools (Braswell et al. 2001; Finn, Gerber, and Boyd-Zaharias 2005; Grigg et al. 2003; Hauser, Simmons, and Pager 2004; Persky, Daane, and Jin 2003; Rumberger and Thomas 2000). One study used data from several national surveys to examine the associations of poverty and urbanicity with school outcomes (Lippman, Burns, and McArthur 1996). The analysis of academic achievement used reading-mathematics composite scores of tenth-graders who participated in the National Education Longitudinal Study of 1988 (NELS:88). Differences in achievement among urban, rural, and suburban schools were significant when school poverty concentration⁷ was not controlled statistically; urban and rural schools had lower average achievement than did suburban schools. No significant differences were found among urban, rural, and suburban schools when poverty concentration was controlled statistically. An analysis of dropout rates used tenth-grade data from the High School and Beyond (HS&B) survey. Differences among urban, rural, and suburban schools remained significant when the concentration of disadvantaged students⁸ was controlled statistically; approximately 74 percent of urban students graduated on time, compared with 84 percent of suburban students. Together, the analyses suggest that urbanicity differences in achievement can be attributed to school poverty levels, but not differences in dropout rates.

Many rural communities, but not all, have high poverty levels. In 1999, an estimated 18 percent of school-age children in rural areas outside of metropolitan statistical areas were living in poverty (Wirt et al. 2003). According to the U.S. Department of Agriculture (2001), the poorest rural areas tend to cluster in particular geographic areas (e.g., Appalachia; the Ozarks; Native American reservations; the northern plains), where the populations are disproportionately poor and the local economies lag behind other rural areas. In general, NAEP assessments show that rural students in grades 8 and 12 score somewhat higher than students in central cities, but lower than students in urban fringe areas (see Loveless 2003). Among rural workers under the federal poverty level, an estimated 28 percent had not completed high school, compared with 11 percent workers with higher incomes (Dagata 2000).

Status Risk Factors and Post-High School Outcomes

Characteristics of Academic Risk Factors

Postsecondary Schooling. The effects of status factors such as coming from a low-income home or attending a school with a high proportion of low-income students carry over to post-high school years. In terms of further schooling, the likelihood of completing a bachelor's degree or higher increases with increased family income (Zucker and Dawson 2001). In an analysis of HS&B data, the researchers found that "a student with a family income of \$40,000 and above was more than three times as likely to have completed a bachelor's degree and more than four times as likely to have completed a graduate degree than a student with a family income under \$15,000"⁹ (p. 9). At the same time, of those who enter 4-year colleges, the likelihood of remaining for more than 3 years is also lower for students from lower income

⁶ Based on the federal poverty threshold from 1998 U.S. Census information.

⁷ The percentage of students receiving free or reduced-price lunches.

⁸ The percentage identified as "disadvantaged" according to the school administrator.

⁹ 1980 dollars.

families (Bradburn 2002); according to data from the Beginning Postsecondary Students Longitudinal Survey (BPS96/98), approximately one-fourth (24 percent to 27 percent)¹⁰ of students from the lowest income quartile depart from college in 3 years or less. The corresponding percentages were 17 percent to 19 percent in the middle income quartiles, and 11 percent to 15 percent in the highest quartile.

Minority racial/ethnic groups, with generally lower incomes than Whites, also attain less postsecondary schooling than do Whites. According to the U.S. Census Bureau (2003), 17 percent of White adults 18 years and older have completed bachelors' degrees, compared to 11 percent of Black adults and 7 percent of Hispanic adults.¹¹ There is a larger ratio of White-to-minority degree holders at each successive stage in the educational ladder: 6 percent of White adults have completed masters' degrees compared to 3 percent of Blacks and 2 percent of Hispanics; and 1 percent of White adults have completed Ph.D. degrees compared to 0.4 percent of Blacks and 0.3 percent of Hispanics (U.S. Census Bureau 2003).

The results are somewhat different for other types of programs and schools. The likelihood of completing an associate's degree or certificate was highest for HS&B students from the second lowest income category (\$15,000–\$25,000) (Zucker and Dawson 2001, table 1). Completion rates for 2-year public institutions were not discernably different among students in low, medium, and high family income quartiles (Bradburn 2002). Thus, while economic disadvantage is a risk factor with respect to higher education, some levels of postsecondary attainment are not hampered as seriously as others.

Employment and Income. An analysis of long-term outcomes from the National Longitudinal Study of Youth (NLSY) examined the role of schools' economic status (Lippman, Burns, and McArthur 1996). The authors compared the economic and educational activities of participants 7 to 15 years after high school. Those who had attended urban schools and schools with the highest proportions of disadvantaged students were less likely to be earning a steady income than were those who had attended other schools. In particular, 76 percent of participants from high-poverty schools were employed for pay compared to 81 to 88 percent from lower-poverty schools. Although differences by urbanicity were statistically significant (urban and rural less than suburban), the differences "disappeared after taking into account differences in the concentration of disadvantaged students in their high schools"¹² (p. 41). These findings emphasize that early economic disadvantage is related to later educational and work-related outcomes

The findings apply particularly to minorities, who disproportionately come from low-income homes and attend high-poverty schools (Grigg et al. 2003; Lippman, Burns, and McArthur 1996; U.S. Department of Commerce 2002). As adults, these groups trail Whites on virtually all indicators. The unemployment rates in October 2003 were 5 percent for Whites, 12 percent for Blacks, and 7 percent for Hispanics (U.S. Department of Labor 2003). According to the U.S. Census Bureau (DeNavas-Walt, Cleveland, and Webster 2003), of all persons 15 years

¹⁰ The range encompasses public and private 4-year institutions.

¹¹ Percentages computed from table 1 of U.S. Census Bureau (2003).

¹² Similar results were found for postsecondary degree attainment.

and older, 27 percent of Whites earned less than \$25,000 in 2002, compared to 44 percent of Blacks and 36 percent of Hispanics (of any race).

The Relationship of Academic Risk Factors to Post-High School Endeavors

Academic risk shapes the relationship of status risk factors with post-high school endeavors. Minority students and students from low-income homes have poorer academic achievement and lower graduation rates, on average, than do White students or those from higher-income homes.¹³ Poor grades and dropping out of school are also academic risk factors with respect to entry into postsecondary schooling, maintaining continuous employment, and earning high levels of income.

Postsecondary Schooling. Data from longitudinal surveys illustrate the relationship between high school graduation/dropout and postsecondary schooling. According to NELS:88, 87 percent of students who never dropped out of high school attended some form of postsecondary schooling within 8 years,¹⁴ compared to 43 percent of students who dropped out one or more times (NCES 2004). Further, the HS&B survey showed that, of students who graduated on time¹⁵ in 1982, 9 percent had earned an associate's degree by 1992, and 28 percent had earned a bachelor's degree or higher (Snyder, Tan, and Hoffman 2004).¹⁶ Of students who left high school for a period of time and then returned to graduate, 7 percent earned an associate's degree and 4 percent earned a bachelor's degree or higher. For students who did not complete high school, 2 percent earned an associate's degree and 1 percent earned a bachelor's degree or higher.

Even among students who complete high school, grades are related to postsecondary schooling. Kane (1998) analyzed longitudinal data from the HS&B survey to study student characteristics related to college admission.¹⁷ A one-letter grade decrease in students' grade averages (GPAs) was accompanied by a 7 percent decrease in the chances of being admitted to a 4-year college, when race/ethnicity, high school activities, and college selectivity were controlled statistically (Kane 1998). The relationship of grades with college admission was stronger in more selective colleges¹⁸ (Kane 1998; see also Sax et al. 2001).

Employment. Individuals from economically disadvantaged backgrounds spend less time employed for pay and have higher transition rates from work to unemployment (less "job constancy") compared to individuals from more affluent backgrounds (Holzer and LaLonde 2000; Royalty 1998). High school attainments also play a role in this connection. Using data from the National Longitudinal Survey of Youth (Center for Human Resource Research 1997), Holzer and LaLonde (2000) tabulated the percentage of time young adults (ages 23–27) spent in the labor force¹⁹ during a 5-year span from 1991 to 1995. With one exception, the percentages

¹³ See "Status Risk Factors and School Outcomes," pgs. 2-4 of this report.

¹⁴ Within 8 years of the expected graduation date (1992).

¹⁵ That is, together with their entering freshman class.

¹⁶ Calculated from table 309 of Snyder, Tan, and Hoffman (2004).

¹⁷ Based on students' reports of whether or not they had been accepted.

¹⁸ Selectivity based on the average scores of entering freshman on the Scholastic Aptitude Test (SAT).

¹⁹ Holzer and LaLonde (2000) analyzed data on individuals who held regular jobs for 30 or more hours per week.

increased monotonically with educational attainment for both males and females.²⁰ Male and female dropouts reported spending 76 percent and 37 percent of their time employed during the 5-year period. In contrast, male and female high school graduates reported being employed 81 percent and 65 percent of the time, respectively. Male and female college graduates reported that they were employed 88 percent and 86 percent of the time, respectively.

Royalty (1998) calculated annual job-to-nonemployment turnover rates for 22- to 30-year-olds. For males and females who had not continued past high school, the percentages were 15 percent and 21 percent, respectively; for males and females with more than a high school education the rates were 13 percent and 14 percent, respectively. Less than a high school education increased job loss for both men and women. The high turnover rate for female dropouts was consistent with the low percentage of employed time reported by Holzer and LaLonde (2000). Further, the turnover rates were higher for non-Whites than for Whites in three of the four education/gender categories (all except females with greater than a high school education).²¹

Farber (1998) used data from the Displaced Workers Survey (DWS), a supplement to the Current Population Survey (CPS), to examine the condition of the labor market over the period 1979 through 1996. The analysis revealed that historically in weak job markets, job loss rates of less educated workers were higher than those of more educated workers; that is, recessions tended to have a bigger impact on less educated workers. This trend has reversed in recent years. The rise in jobless rates in 2001–2003 was higher for college graduates than for high school dropouts (Bernstein and Mishel 2003). The authors concluded that the unusual pattern occurred because of the specific sectors hit hardest by the recession—technology and financial services in particular.

Income as Adults. That individuals from economically disadvantaged backgrounds have lower earnings as adults is attributable in part to school attainment. Data from the Census Bureau showed that the annual earnings of full-time year-round workers (ages 25–64 years) increased monotonically with educational attainment, from \$23,400 for high school dropouts to \$89,400 and above²² for persons with doctoral and professional degrees (Day and Newburger 2002). Over a typical work life, today’s workers with a bachelor’s degree earn nearly twice as much as workers with a high school diploma. On the whole, individuals from low-income backgrounds acquire fewer years of schooling and thus may have fewer skills with which to obtain lucrative jobs.

Large-scale studies have established a relationship between achievement test scores and wages earned as an adult. Using data from the National Longitudinal Study of the High School Class of 1972 (NLS72), Murnane, Willett, and Levy (1995) demonstrated that mathematics test scores in high school were significantly related to subsequent educational attainment and to wages at age 24. Neal and Johnson (1996) used NLSY data to ask whether years of schooling and scores on the Armed Forces Qualification Test (AFQT) explained wage differences between

²⁰ The exception was less time in the labor force for individuals still attending college after age 22 (see table 2 of Holzer and LaLonde 2000).

²¹ The authors used the term “non-Whites” and did not distinguish among minority groups.

²² 1999 dollars.

Black and White adults in their late 20s. The AFQT was used as a measure of cognitive skill attained through schooling. Scores on the AFQT explained nearly three-fourths of the Black-White wage gap for men and the entire Black-White gap for women. When years of schooling was used as a measure of skill in place of AFQT scores, it explained a significant portion of the wage gap but not as much as test scores did.²³ The researchers concluded that the amount of human capital acquired by individuals by their late teens—in particular skills such as those represented by the AFQT—was a starting point that can limit future human capital and future wages.

The relationship between high school achievement and income has been shown to get stronger as adults approach age 30. Data from the NLSY show that the income gap between those who scored higher and those who scored lower on tests of mathematics, science, and paragraph comprehension began to emerge at age 23 and increased up to age 31 (Decker, Rice, and Moore 1997; see also Murnane, Willett, and Levy 1995).

Summary

To be certain, these studies and other research on the relationships of status risk factors with adult outcomes do not permit causal conclusions; however, together they show that early economic disadvantage is associated with attenuated adult accomplishments. Further, degrees of success or non-success in high school (i.e., academic risk factors) are related to postsecondary education and employment.

In this report, the hypothesis is tested that, despite the many impediments, some students at status risk attain more postsecondary education, maintain more consistent employment, and have higher incomes than do others. The antecedents considered are school related, that is, academic risk in the form of grades, test scores, and graduation from high school, and behavioral risk in the form of engagement/disengagement in school.

Behavioral Risk Factors: Engagement/Disengagement in School

Characteristics of Behavioral Risk Factors

Engagement in school is “the attention, interest, investment, and effort students expend in the work of school” (Marks 2000, p. 155). Studies of engagement recognize two facets—a behavioral component, participation, and an affective component, sometimes called identification with school (see Finn 1989; NRC and IOM 2004). Students who participate actively in school and the classroom, and who identify with school, increase the likelihood of successful academic outcomes. Those who do not have been referred to as disengaged; this pattern is found disproportionately among minority students and those from low-income homes (Finn 1993; Rumberger and Larson 1998; Steele 1992; Wehlage et al. 1989). Failing to participate in classroom and school activities, exhibiting adverse social behavior, and feeling

²³ Years of schooling explained one-fifth of the gap for men and one-sixth of the gap for women (Neal and Johnson 1996, p. 875).

emotionally disconnected from school²⁴ are risk behaviors that can compound the obstacles to success posed by status risk factors such as SES or race/ethnicity.

Participation. Participation has been described as having three components (Finn 1989). Level 1 participation includes the student's acquiescence to school and class rules, including the requirements to arrive at school and class on time, attend to the teacher, come prepared for class, and to respond to directions or questions initiated by the teacher. Noncompliant behavior (e.g., disruptive behavior or refusing to complete assigned work) represents a student's failure to meet those basic requisites. Poor school attendance and failing to respond to the teacher are consistently found to be associated with low academic performance among high school students (e.g., deJung and Duckworth 1986; Finn and Rock 1997; Kerr et al., 1986; Laffey 1982; Lee and Smith 1995; Marks 2000; Rowe and Rowe 1992).

Level 2 participation involves initiative-taking on the part of the student, for example, doing more work than required or seeking help from school staff when experiencing problems (see Nelson-LeGall and Jones 1991). Level 3 participation is involvement in the social, extracurricular, and athletic aspects of school life in addition to or in place of extensive participation in academic work. Data on the relationship of participation in the social or extracurricular aspects of school life suggest a positive relationship with academic achievement (e.g., Camp 1990; Cooper et al. 1999; Gerber 1996; Marsh 1992; Marsh and Kleitman 2002; Melnick, Sabo, and Vanfossen 1992).

Identification With School. The affective component of engagement, identification with school, has been defined as an emotional bond, or attachment, that the youngster experiences with respect to the institution (Finn 1989; Voelkl 1997). Identification has two closely related components, students' sense of school membership, sometimes referred to as school belongingness, school bonding, or school connectedness, and students' valuing of school-related outcomes. For the most part, these components have weak or indirect relationships with academic achievement (e.g., Goodenow 1993; Voelkl 1997), although research has shown that high identification with school is associated with high motivation and effort (Goodenow 1993; Goodenow and Grady 1993; Osterman 2000; Pintrich and DeGroot 1990).

Low identification (disidentification) is associated with a spectrum of adverse behaviors including academic cheating (Finn and Frone 2004), drug and alcohol use during the school day (Hawkins, Catalano, and Miller, 1992; Voelkl and Frone 2000), a range of health risk behaviors (Resnick et al. 1997), and dropping out of school (Jessor, Turbin, and Costa 1998; Newmann, Wehlage, and Lamborn 1992; Rumberger and Larson 1998).

The valuing component of identification is the specific belief that school provides the individual with useful outcomes. This concept, also called utility (see Updegraff et al. 1996), is distinct from general valuing of education as expressed in statements such as "everyone should complete a high school education" or "a good education is important for all." In an analysis of different meanings of valuing, Mickelson (1990; p.51) found that "concrete" school attitudes such as the belief that schooling pays off later with good jobs were associated with positive school outcomes for Black students, but more abstract attitudes were not (e.g., the belief that "If

²⁴ That is, "disidentifying" from school (Goodenow and Grady 1993; Voelkl 1997).

everyone in American gets a good education, we can end poverty”). Because of its relationship to minority students’ beliefs about education, perceptions that school is providing information and skills that are useful to the individual may help sustain students’ participation in school.

The Connection with Academic Risk Factors

Risk factors are conditions or behaviors associated with a lower likelihood of positive outcomes. “*Protective factors* have the reverse effect; they enhance the likelihood of positive outcomes and lessen the likelihood of negative consequences from exposure to risk” (Jessor, Turbin, and Costa 1998, p. 195; see also Garnezy 1993; Rutter 1990; Werner 1995). Because of its direct relationship with positive outcomes and inverse relationship with negative outcomes, school engagement has been viewed as both: a behavioral risk factor when students are disengaged, and a protective factor when engagement is high (Finn and Rock 1997; Resnick et al. 1997; Steinberg and Avenevoli 1998).

Two programs of research have examined the relationship of engagement with academic success among status risk students. One research team used path models with several data sets to study the antecedents of school performance in three samples of Black adolescents (Connell, Spencer, and Aber 1994; see also Connell 1990; Connell and Wellborn 1991). A measure of engagement was developed that included both behavioral and affective components. Significant positive correlations were obtained with an index of positive educational outcomes (e.g., good attendance; high test scores) and significant negative correlations with an index of negative outcomes (e.g., low achievement scores; in-grade retentions; suspensions). The results were consistent for all three samples, with correlations ranging as high as 0.51.

Other research has been based on the “participation-identification model” (Finn 1989). The model explains school outcomes as resulting from a sequence of behaviors and attitudes that may begin in the early grades (Finn 1989). Research based on this model focuses on participation and identification as antecedents of academic achievement and graduating/dropping out.

Two studies examined data from early waves of the NELS:88 survey (Finn 1993; Finn and Rock 1997). In the first (1993), 5,945 eighth-grade students at risk due to status characteristics were classified into one of three achievement groups based on standardized mathematics and reading tests. The groups were compared on measures of school engagement including indicators of attendance, classroom participation, disruptive behavior, extracurricular behavior, and identification with school. Differences were found among the achievement groups on all participation measures: students classified as academically unsuccessful scored lower than the other groups on teachers’ and students’ reports of attendance, academic preparation, and classroom participation. The three achievement groups were distinct on homework and extracurricular participation. And unsuccessful students rated school subjects as less useful to them than did the other two groups. The differences for other indicators of identification, including more abstract attitudes, were marginal or nonsignificant.

In the second study (1997), 1,803 minority students from the lower half of the SES distribution²⁵ were classified as resilient students, nonresilient completers, and dropouts, on the basis of grades, test scores, and high school graduation. Resilient students were those who obtained reasonable grades and test scores and graduated on time; nonresilient completers were students who persisted through high school graduation but with lower scores or grades; dropouts were those who left school without graduating. The groups were compared in terms of psychological characteristics (self-esteem and locus of control) and teacher and students' reports of school and classroom participation.

Significant differences were found on engagement measures even after background and psychological characteristics were statistically controlled. Resilient students scored higher than nonresilient completers on five out of six participation measures. Nonresilient completers, in turn, scored higher than noncompleters on the same measures. Effect sizes for both comparisons were moderate to large.

The analyses reported here extend the study of school engagement/disengagement by examining its relationship with post-high school accomplishments.

Overview of This Report

This report presents the results of an analysis of the experiences of students at risk due to status characteristics ("status risk" students), and their educational and job-related attainments as young adults. The analysis focused on the question: Among students at risk due to status characteristics, what are the relationships of high school engagement (behavioral risk) and attainments (academic risk) with post-high school education and employment?"

Data for the analysis were drawn from the fourth follow-up wave (2000) of the National Education Longitudinal Study of 1988 (NELS:88), in which students were followed from 1988, when they were in grade 8, until 2000, when most were 26 years old. A subsample of students was selected who met two criteria for being at status risk in grade 8: students were included if they came from low-SES homes²⁶ and attended a school with a large proportion of low-income students. Despite that all students in the sample shared these characteristics, significant variability was found in short-term and long-term outcomes.

The short-term outcomes examined were high school grades, test scores, and graduation/dropout. These were used to identify three high school attainment groups, referred to as successful completers, marginal completers, and noncompleters. Attainment group was considered to be an academic risk factor with respect to post-high school endeavors (postsecondary schooling and employment). The behavioral risk factors considered were indicators of students' engagement/disengagement in school, constructed from student and teacher reports.

²⁵ Based on the NELS:88 SES composite of household income, parents' educational attainments, and parents' occupations.

²⁶ Based on household income, parents' educational attainments, and parents' occupations.

The specific questions for the analysis were:

(1.1) Academic risk and postsecondary education: Are attainments in high school related to postsecondary education among status risk students?

(1.2) Academic risk and employment: Are attainments in high school related to later employment and income among status risk students?

(2.1) Behavioral risk and postsecondary education: Is engagement in high school related to postsecondary education among status risk students?

(2.2) Behavioral risk and employment: Is engagement in high school related to later employment and income among status risk students?

(2.3) Behavioral and academic risk: If engagement is related to young adult outcomes (education and employment), is the connection attributable to high school attainments?

Bivariate and multivariate analyses were conducted. The bivariate analyses provided information about status-risk students and how they compare to their non-status-risk counterparts. Bivariate analyses were also used to examine relationships of high school attainment and engagement with postsecondary schooling and employment one variable at a time. Multivariate regression analyses provided information about the same relationships but considered the simultaneous effects of attainment or engagement with student background characteristics. Several regressions were conducted for each outcome measure. First, high school attainment groups were treated as the main independent variables to address questions (1.1) and (1.2). Second, measures of school engagement were treated as the main independent variables to address questions (2.1) and (2.2). A final analysis addressed question (2.3), with both sets of independent variables considered simultaneously.

A type I error rate of .05 was used throughout. Of the many statistical tests presented in this report, it can be expected that approximately 5 percent that appear significant do not represent real nonzero differences; unfortunately, it is not possible to identify which tests those may be. All statistical findings were accompanied by corresponding strength-of-effect measures.

Caveats

NELS:88 provided a particularly rich data set for this analysis. A large, representative sample of students was followed for 13 years with age-appropriate measures collected at five time points. The measures spanned status characteristics (e.g., family income, race/ethnicity), psychological and behavioral processes (e.g., school attendance, classroom participation, attitudes toward school subjects), and measures of academic performance. Nevertheless, certain design features limit the strength of the conclusions that can be drawn.²⁷

²⁷ More detailed technical issues are discussed in appendix A; for example, incomplete data on some variables.

First, a broad-based survey such as NELS:88 is designed to serve many purposes but may not address particular questions in depth. To a certain extent, this is the case with this analysis. Several measures of school engagement were derived from student and teacher reports, but others may have been desirable as well. Although the questions asked about students' learning and social behavior in the classroom were central to the construct "participation," the number of questions was limited. And few questions tapped the construct "identification with school." Conclusions about school engagement are limited to the four aspects of engagement that could be measured from available data.²⁸

Second, many of the NELS:88 measures are based on participants' self-reports. The potential biases in self-report data are recognized widely, attributable to factors such as memory distortion (Tanur 1992) or the desire to make a good impression (Paulhus 1991). One study examined bias in HS&B responses (Fetter, Stowe, and Owings 1984), a survey similar to NELS:88 in many ways. The authors found that the correlations of self-reports with factual data (e.g., school grades) were highest, but tended to decrease with the passage of time. The correlations with less factual information (e.g., parents' aspirations for students) were somewhat lower.

In the analyses reported here, every attempt was made to use the most objective data available for each measure. Teacher ratings of absenteeism and classroom behavior were used instead of students' self-reports; achievement tests constructed and scored by the NELS:88 researchers were used as a component in classifying students into attainment groups; multiple indicators were used to determine whether or not a student graduated from high school; and transcripts from postsecondary schools were used to determine whether a student entered a program of study and the number of credits earned.

In some instances, this resulted in reduced sample sizes for particular variables.²⁹ Specifically, the number of credits earned in postsecondary education, taken from transcripts, was available only for 85 percent of those who entered postsecondary programs. And teachers' ratings of student attendance and classroom behavior were only available for 87 percent of the eligible students.³⁰ In all instances, cases missing a value were omitted from analyses using that particular variable. As a result, there may be a degree of bias in some of the statistical relationships given in this report, especially for these three measures.

Third, NELS:88 did not involve any experimental intervention. Although it may be desirable to know if high school attainment or engagement is causally connected to adult outcomes, survey methodology only provides a conclusion that events do or do not occur in the same individuals.

Further, in nonexperimental research there is always the possibility of bias in the results due to "specification error," that is, the omission of other variables from the regression analyses. For example, home background was controlled to some extent in this analysis by excluding all

²⁸ These four aspects of engagement have been used in these or similar forms in Finn (1993), Finn and Rock (1997), Gerber (1996), and Marsh and Kleitman (2002).

²⁹ See table A-1 in appendix A for final response rates.

³⁰ That is, 87 percent of those still in school at the time of the ratings.

students but those from low-SES homes, and by including race/ethnicity and urbanicity in the regressions. Specific home processes that may vary within the group of low-SES families were not considered, however, nor were school policies and practices that may affect student engagement and attainment. The results should be viewed with these limitations in mind.

Organization of the Report

Chapter 1 of this report provides the background and rationale for the analysis, and introduces the concept of school engagement and its likely relationships with adult outcomes. Chapter 2 describes the NELS:88 survey in greater detail and the sample, measures, and methods used in this analysis. Chapter 3 presents the first set of statistical results. Status-risk students are compared to non-status-risk students, and three attainment groups are described. The questions about the relationship of academic risk factors with adult outcomes (questions 1.1 and 1.2) are addressed in this chapter. Chapter 4 presents statistical results about behavioral risk factors and addresses the questions about behavioral risk and adult outcomes (2.1, 2.2, and 2.3). Chapter 5 summarizes the findings of the analysis. Appendixes A–D contain additional technical information about the analyses, including a full description of the measures used.

2. Data Source and Methods of Analysis

The analyses described in this report were based on data collected in the National Education Longitudinal Study of 1988 (NELS:88). NELS:88 was designed to follow a nationally representative sample of eighth-grade students until well beyond their high school years. The original eighth-grade base year sample was chosen through a two-stage stratified sampling design (see Spencer et al. 1990). At the first stage, 817 public and 240 private schools that enrolled eighth-grade students were selected.³¹ At the second stage, an average of 25 eighth-grade students were selected from each school, resulting in a total sample of over 26,000 students, of whom 24,599 actually participated in the survey.³²

The survey followed the progress of each student during the remaining years of high school, with data collection points at the end of tenth grade (first follow-up, 1990) and twelfth grade (second follow-up, 1992).³³ Students who left high school without graduating, as well as those who remained in school, were contacted and administered survey instruments. The tenth-grade and twelfth-grade samples were “freshened” with new students at the same grade levels so that the sample at each grade level was representative of the population of students in that year.³⁴

Further data collection points occurred in 1994, when most participants were 2 years past high school (third follow-up), and in 2000 when most participants were 8 years past high school and about 26 years old (fourth follow-up). To save on data collection costs, participants were subsampled in both post-high school waves of data collection. The final sample included 10,827 respondents who participated in all five waves of data collection. Details of sampling and other technical issues are given in depth in *Base-Year to Fourth Follow-up Data File User’s Manual* (Curtin et al. 2002).

During eighth grade and high school, the students completed extensive questionnaires and took achievement tests in reading, mathematics, science, and history. Additional information was collected from their parents, teachers, school principals, and high school transcripts. During the post-high school years, participants were interviewed through computer-assisted telephone interviewing (CATI) and computer-assisted personal interviewing (CAPI) techniques. College transcripts were obtained for those who participated in formal postsecondary schooling, including 2- and 4-year college programs and certificate programs.

³¹ Of the 1,057 schools, 1,052 provided student data.

³² See appendix A for more information about the design and response rates for NELS:88.

³³ The follow-ups were conducted in 1990 and 1992. Not all students were in tenth or twelfth grade in those years.

³⁴ This permitted cross-cohort comparisons with other surveys of tenth-grade and twelfth-grade students, particularly the National Longitudinal Study of 1972 (NLS72) and the High School and Beyond Survey (HS&B), both conducted by the National Center for Education Statistics (NCES).

Participants in the Analysis

This report is based on data for respondents who participated in all five waves of the NELS:88 survey and who were at risk for school failure in eighth grade (base year) due to status characteristics. Risk status was determined from the socioeconomic level of the student's family and school in the base year of the survey. Students whose parents were in the lower half of the distribution of family socioeconomic status (SES), and whose school was in the upper half of the distribution in terms of the percentage of students receiving free lunches were classified as being at status risk.

The family SES measure³⁵ was a numerical composite of reports of the parents' education and two measures directly related to the family's economic status, namely, household income and parents' occupations. The median of base year SES was computed for all students in the five-wave sample,³⁶ students at or below the median were eligible to be included in the analysis. Second, the median percentage of students receiving free lunches in the base year was computed for schools;³⁷ schools at or above this value were termed "low-SES schools." Students attending a low-SES school, and who also met the family SES criterion, were included in the sample.

Of 10,827 students who participated in all waves of data collection, 15 were missing school lunch information. The remaining 10,812 participants formed the basis for identifying status risk students. A total of 3,502 participants met the status risk criteria, or 32 percent of the full group (33 percent weighted³⁸).

The demographic characteristics of the sample are summarized in table 1.³⁹ Roughly the same percentages of male and female eighth-grade students were identified as being at risk according to the two socioeconomic factors. Over half of eighth-grade Hispanic students (59 percent), Black students (56 percent), and Native American/Alaska Native students (54 percent) were at status risk, and approximately one in four White students (26 percent) and one in five Asian/Pacific Islander students (21 percent) were identified as being at status risk. In terms of urbanicity, 38 percent of students attending urban schools, 46 percent of students attending rural schools, and 22 percent of students in suburban schools were at status risk according to the two socioeconomic factors. Thirty-seven percent of public-school students were identified as being at status risk, but only 9 percent of students attending Catholic schools and 1 percent of students attending other private schools.⁴⁰

³⁵ NELS:88 variable BYSES.

³⁶ Weighted median, using the five-wave sampling weight F4PNLWT.

³⁷ The reported percentage of students receiving free lunches was used, which is likely to be somewhat lower than the percentage who are eligible. The median was 16 percent of students receiving free lunches. For schools missing the free-lunch index in grade 8, the index was taken from tenth-grade school information (and compared to the tenth-grade). Sixty-eight of 3,502 status risk cases were identified in this way.

³⁸ The NELS:88 sampling weight F4PNLWT was computed so that the five-wave sample represented the population of 1988 eighth-grade students 12 years later, in 2000.

³⁹ Additional unweighted sample sizes are given in table C-1 (appendix C).

⁴⁰ "Other private schools" included religious schools other than Catholic and nonreligious private schools. Because of the small number of Catholic and other private school students in the sample, sometimes coupled with missing values on some variables, school types were not compared in any further analyses.

Table 1. Status risk sample, by demographic characteristics: 1988

Characteristic	Unweighted sample size	Weighted percentage ¹
All	3,502	33.1
Gender		
Male	1,570	31.9
Female	1,932	34.3
Race/ethnicity		
White, not Hispanic	1,976	25.6
Black, not Hispanic	526	56.1
Hispanic	759	58.7
Native American, Alaska Native	65	54.0
Asian, Pacific Islander	176	20.7
School urbanicity - 8th grade		
Urban	887	37.8
Suburban	1,040	21.7
Rural	1,575	45.5
School type - 8th grade		
Public	3,402	36.8
Catholic	94	8.8
Other private ²	6	1.1

¹Weighted percentage of all members of the corresponding population or subpopulation (e.g., 31.9 percent of all eighth-grade males were at-risk due to status characteristics). Percentages weighted by F4PNLWT.

²Includes 'private other religion' and 'private non-religious.'

NOTE: Status risk classification based on eighth grade (base year) student and school socioeconomic status. Standard errors are given in appendix B, table B-1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Variables

Four primary sets of variables were used for this report:

- demographic characteristics (status risk variables);
- engagement/disengagement measures (behavioral risk variables);
- high school attainments (academic risk variables);
- post-high school education and employment.

Details of the variables are given in appendix D, including those constructed from the NELS:88 data specifically for this analysis. In some instances, when information was missing for a particular school year but was present for another year, data from the alternate year was used as long as the survey question was asked in the same way on both occasions and the information was likely to be relatively stable over time. The substitution rules are documented in appendix D.

Status Risk: Demographic Characteristics

In addition to the student's family SES, school percent free lunch, and student and school demographics such as gender, race/ethnicity, urbanicity, and school type, a series of base year family characteristics was taken directly from the NELS:88 data files. The additional variables provided a more complete picture of the status risk sample as compared to non-status risk students. These included components of the SES composite (e.g., parents' educational attainments, family income) and other factors closely related to SES (e.g., family composition,⁴¹ the number of children in the family, whether a language other than English is typically spoken in the home, number of times the participant changed schools prior to eighth grade).

Behavioral Risk: Engagement/Disengagement Measures

Four composite measures of engagement in school were obtained. These spanned both the behavioral and affective components of engagement (Finn 1989; NRC and IOM 2004) and were similar to those used in earlier studies (Finn 1993; Finn and Rock 1997). Two of the measures were based on teachers' ratings of students and two were based on students' self-reports. Teacher ratings consisted of responses of two tenth-grade teachers to a set of classroom behaviors (either the mathematics teacher or the science teacher and either the English or history teacher).

The behavioral indicators included an attendance composite ("ABSTARDY") obtained from teachers' responses to "How often is the student absent?" and "How often is the student tardy?" Response categories for each question ranged from "never" to "all the time." Items were reverse-scored so that higher ratings meant better attendance. The two teachers' responses to each item were averaged, and the two items were then averaged to obtain the final scale score. Scores on the composite ranged from 1 to 5 (mean = 3.9);⁴² the internal consistency of the scale (coefficient α) ranged between 0.59 and 0.65 for the status risk sample.⁴³

A second index ("CLASSBEH") reflected the student's behavior with respect to class work. The measure was obtained by combining teachers' responses to the yes-no prompt "Student usually works hard," and to three never-to-often questions: "How often does the student do homework?" "How often is the student attentive in class?" and "How often is the student disruptive in class?" Each item could contribute one point to the CLASSBEH score. "Work

⁴¹ Family composition was used to determine if the student was living with both biological parents or not living with both biological parents.

⁴² Mean of weighted responses using NELS:88 sampling weight F4PNLWT. Standard errors of engagement measures are given in appendix B, table B-7.

⁴³ Four reliability analyses were performed, for students rated by their mathematics and English teachers, mathematics and history teachers, science and English teachers, and science and history teachers.

hard” was scored 1 if both teachers answered “yes;” “Homework” and “Attentive” were each scored 1 if the average of the two teachers was in the “most” or “all” range; “Disruptive” was scored 1 if the average of the two teachers was in the “rarely” or “never” range. Scores on CLASSBEH ranged from 0 to 4 (mean = 2.3); the internal consistency of the scale (coefficient α) was 0.78.

A third index reflected the student’s engagement in school-sponsored extracurricular activities in tenth grade. The student was presented with a list of 15 activities including both athletics and academically oriented programs.⁴⁴ Variable “EXTRACUR” was the number of activities indicated by the student, up to a maximum of 6. Students indicating more than 6 activities were assigned the value 6.⁴⁵ For 102 students (3 percent) who did not answer the item in tenth grade, their twelfth-grade responses were used instead. Scores on EXTRACUR ranged from 0 to 6 (mean = 1.6); the internal consistency of the scale (coefficient α) was 0.56.⁴⁶

The affective measure of engagement was based on research emphasizing the importance of students’ perceptions that school provides information of value to the student (e.g., Eccles 1983; Mickelson 1990; Updegraff et al. 1996). The variable “UTILITY” was obtained from students’ responses in eighth grade to a question asking how useful four school subjects (mathematics, English, science, social studies) will be in their future.⁴⁷ Respondents were asked to choose “strongly agree,” “agree,” “disagree,” or “strongly disagree” that each subject “will be useful in my future.” The UTILITY score was the average of the four responses, recoded so higher scores indicated more positive values. Scores on UTILITY ranged from 1 to 4 (mean = 3.0); the internal consistency of the scale (coefficient α) was 0.71.

Students who dropped out of school before tenth grade were missing tenth-grade teacher ratings and extracurricular activities. Also some tenth-grade students were not rated by their teachers.⁴⁸ To maximize the number of students with engagement data available, twelfth-grade ratings and extracurricular activities were substituted for missing tenth-grade ratings.⁴⁹ The final sample sizes for engagement ranged from 2,991 cases for teacher ratings to 3,306 for student self-reports, out of 3,502 students in the full status risk sample.

Correlations among the engagement measures for the status risk sample were all positive. The correlation between ABSTARDY and CLASSBEH was 0.49, between EXTRACUR and the two teacher ratings 0.12 and 0.11, and between UTILITY and the three other scales 0.05, 0.07, and 0.11, respectively.⁵⁰

⁴⁴ This was a subset of 18 activities listed in the NELS:88 questionnaire. See appendix D for details.

⁴⁵ Higher values were obtained by 2 percent of the sample of tenth-grade students, including some who checked most or all of the 15 activities.

⁴⁶ This value, based on all 15 activities, reflects that correlations among the specific activities were low. The total score, constrained to a maximum value of 6, was likely to be more reliable than 0.56 indicates.

⁴⁷ This question was not posed in the tenth-grade or twelfth-grade NELS:88 questionnaire.

⁴⁸ One or both teacher questionnaires missing for these students.

⁴⁹ This was possible for 183 students on the ABSTARDY measure and 194 students on CLASSBEH.

⁵⁰ All significant at $p < .05$.

High School Attainments/Academic Risk

The participants in the analysis were classified into one of three attainment groups based on their reading and mathematics test scores in eighth and tenth grades, self-reported grades in four school subjects in tenth grade, and whether or not they graduated from high school. The groups were referred to as “successful completers,” “marginal completers,” and “noncompleters,” based on the definitions used in Finn and Rock (1997). Attainment groups were viewed as outcomes of the high school experience and as an indicator of academic risk for postsecondary education and employment outcomes.⁵¹

Successful completers (21 percent⁵²) were students who met three conditions: they remained in school through twelfth grade and graduated on time,⁵³ attained “reasonable” scores on the reading and mathematics tests in eighth and tenth grades, and reported receiving “acceptable” course grades in tenth grade. Conservative achievement criteria were used on the assumption that these represent noteworthy accomplishments for students with multiple risk factors. The reading/mathematics determination was based on an equally weighted composite of the two achievement tests, formed separately in each grade. Reasonable performance was defined as a score one-fourth of a standard deviation below the mean of the entire (status risk and nonrisk) population and higher;⁵⁴ this was approximately the 45th percentile of performance in the eighth grade and the 42nd percentile in the tenth grade. A grade point average (GPA) was computed for students from their self-reported grades in mathematics, English, history, and science.⁵⁵ Grades in each subject were recorded as “mostly A’s,” “about half A’s and half B’s,” “mostly B’s,” “about half B’s and half C’s,” “mostly C’s,” “about half C’s and half D’s,” “mostly D’s,” and “mostly below D.” Acceptable grades were defined as a GPA of “about half B’s and half C’s” or better.

Students who did not meet all three criteria were classified as marginal completers or noncompleters. Marginal completers (52 percent) were still in school in 1992, mostly (96 percent) in twelfth grade. All marginal completers graduated from high school, either on time or else by the time of the third NELS:88 follow-up (1994).⁵⁶ These students did not attain reasonable test scores and/or acceptable course grades, however.

Noncompleters had not received a high school diploma by the time of the third NELS:88 follow-up. This was confirmed through two NELS:88 variables: noncompleters (27 percent) were either classified as dropouts and had been asked to complete a dropout questionnaire in the

⁵¹ Unweighted sample sizes for attainment groups, cross-classified by demographic characteristics, are given in table C-1 (appendix C).

⁵² Weighted by NELS:88 sampling weight F4PNLWT.

⁵³ On-time graduation was determined by a combination of criteria. All successful students were in school in grade 12 in the spring of 1992 (NELS:88 variable F4UNI2D) and none had dropped out of school (NELS:88 variable F2TRSTYP). Further validation was provided by F3DIPLOM, an indicator that students had received a high school diploma by the third follow-up (1994).

⁵⁴ That is, $\bar{X} - 1/4 S$ or better; also used in Finn and Rock (1997).

⁵⁵ Self-reported grades tend to be somewhat inflated relative to actual grades received but the amount of bias is similar for sex, SES, and achievement groups (Fetters, Stowe, and Owings 1984). In this analysis, grades served as a supplement to scores on the externally constructed achievement tests.

⁵⁶ Ten percent of marginal completers graduated after the second follow-up.

second follow-up, or were in school at the time of the second follow-up but not in twelfth grade and had not received a high school diploma by the third follow-up.⁵⁷

Postsecondary Education

Three measures of postsecondary educational attainment were used in bivariate analyses. The first (“FRSTINST”) was the type of postsecondary institution, if any, the student entered. This information was taken from variables in the postsecondary transcript file;⁵⁸ for students missing transcript information, it was taken from the fourth follow-up interview.⁵⁹ The responses were combined into four categories: none, less-than-2-year school, 2-year school, and 4-year school.

For those who attended, two measures indicated the persistence in postsecondary schooling. One was the total number of credits earned in all postsecondary schooling (“TOTCRED”), taken directly from the NELS:88 postsecondary transcripts.⁶⁰ The other (“HIGHDEGR”) indicated completion of a postsecondary program. Respondents reported the highest postsecondary degree they had attained by the time of the fourth follow-up (2000), if any. Because this measure was taken from self-reports instead of school transcripts, it indicated completion of any postsecondary program up to that time, even if the participant had attended several schools. Responses were classified as certificate/license, associate’s degree, or bachelor’s degree or higher.

All three measures were also used in the regression analyses. The first was recoded to indicate whether or not the individual had entered any postsecondary institution. The second (number of credits) was used without recoding. The third was recoded to indicate whether or not an individual who began postsecondary schooling had completed a program of study.

Employment and Income

Five employment/income variables were used in the bivariate analyses, of which three were also used in the regressions. Two current-employment variables were whether or not the individual was employed for pay in 2000, at the time of the fourth follow-up (“EMPLOYED”) and, if the individual was employed, whether his/her current activity was a full-time job (“FULLTIME”). The third variable was the number of hours worked in a typical week during the previous year (1999), for respondents who were employed during that year (“HRSWEEK”).⁶¹ Fourth, total annual income was recorded for participants who worked one or more hours in a typical week in 1999 (“INCOME99”).

⁵⁷ NELS:88 variables F4UNI2D and F3DIPLOM, respectively.

⁵⁸ Transcript variables REFITYPE and REFINST.

⁵⁹ For 231 out of 293 cases missing transcript information. No information was available for 62 cases; these were not included in analyses of postsecondary schooling.

⁶⁰ NELS:88 variable TCREDN. The importance of this index of persistence is highlighted in the U.S. Department of Education’s publication *Answers in the Tool Box* (Adelman 1999).

⁶¹ The number of hours worked in 1999 was used instead of 2000 because annual income was also available for 1999.

Fifth, a “consistent employment” index (“CNSTEMPL”) was formed from employment information from 1997, 1998, and 1999. The index combines information about the number of years worked and whether the work was full-time or part time. Respondents were first asked if they had worked for 6 months or more in 1997 and 1998. Those who responded “no” were given a value of 0.0 for that year. Those who answered “yes” were given a value of 1.0 for that year if they worked full-time and 0.77 if they worked part-time.⁶² The same values were assigned for 1999 but the wording of the survey question was different. Rather than asking the number of months worked, the question requested the number of weeks worked, which was then split into 0 to 25 or 26 to 52. And rather than asking full-time/part-time, the question requested the number of hours worked in a typical week, which was then split into 0 to 37 or more than 37. The values for 3 years were summed to obtain the consistent employment measure.

Because the 1997 and 1998 survey items were worded in terms of 6-month periods of employment, CNSTEMPL reflects the number of consecutive years, out of 3, that the individual worked for at least half of the year. Seventy-four percent of the sample⁶³ received values of 0, 1, 2, or 3, indicating full-time employment for the respective number of half years. An additional 16 percent received values of 0.77, 1.77, or 2.77, indicating that they worked full-time for 0, 1, or 2 half years, and part-time for an additional half year. The remaining 10 percent received other values, indicating multiple half years of part-time work. In 1999, the only year for which actual number of weeks was recorded, 85 percent of respondents who worked for 26 weeks or more actually worked 48–52 weeks; thus, the half year cutoff effectively identified respondents who worked for the full year. The range of CNSTEMPL was from 0.0 to 3.0 (mean = 2.46);⁶⁴ the internal consistency of the scale (coefficient α) was 0.77.

Three employment/income variables were used in the regression analyses: whether or not the individual was employed for pay at the time of the fourth follow-up (“EMPLOYED”), annual income in 1999 (“INCOME99”), and consistent employment (“CNSTEMPL”). Because the distribution of income was skewed, it was transformed to log income in dollars for the analysis.⁶⁵

Data Analysis

The data analysis was conducted in three phases. The first phase provided description of the sample of students at risk due to status characteristics, especially on SES-related variables.

The second phase explored the relationships of attainment groups (academic risk) with adult outcomes. Variable-by-variable differences were examined among the three attainment groups on adult educational and employment/income outcome measures, without controlling for other factors. An overall test of all possible contrasts among the groups on each outcome measure was conducted first.⁶⁶ When the overall test was significant, separate *t*-tests were used

⁶² The value 0.77 is the proportion of a 37.5-hour work week worked by part-time employees in 1999, the only year in which hours worked per week was available.

⁶³ Unweighted percentage.

⁶⁴ Standard error given in appendix B, table B-6.

⁶⁵ Medians are reported instead of means in the descriptive tables.

⁶⁶ A Wald test was used (Wald 1943), which produces a chi-squared statistic.

to compare successful completers with marginal completers, and marginal completers with noncompleters. Next, multivariate regression and logistic regression analyses were used to address questions 1.1 (Are attainments in high school related to postsecondary education?) and 1.2 (Are attainments in high school related to later employment and income?), with other background variables included in the analysis.

The regressions were performed for six selected outcome measures: entering a postsecondary institution; number of credits earned by those who entered a postsecondary program; completing a program of study for those who entered a postsecondary program; whether or not the individual was employed in 2000; consistent employment; and 1999 income for those who were employed in 1999. Binomial logistic regression was used for the categorical dependent variables (entering postsecondary education; completing a program of study; employed in 2000).

The third phase of analysis examined the relationships of engagement/disengagement in high school (behavioral risk) with adult outcomes. Simple correlations between engagement and the six adult outcomes were examined first, without considering other variables. Next, regression and logistic regression analyses were used to address questions 2.1 (Is engagement in high school related to postsecondary education?) and 2.2 (Is engagement in high school related to later employment and incomes?). Demographic and background measures were also included in the regressions.

To answer question 2.3 (If engagement is related to young adult outcomes, is the connection attributable to high school attainments?), regression analyses included attainment groups and the engagement measures simultaneously.

The Regression Analyses

The primary independent variables of the regressions were the three attainment groups (for questions 1.1, 1.2) and the four school engagement measures (for questions 2.1, 2.2, and 2.3). In each analysis of attainment groups, two comparisons (“contrasts”) were made: successful completers were compared to marginal completers, and noncompleters were compared to marginal completers. In each analysis of engagement, the four engagement measures were entered in the regression simultaneously (as a “block”).

Other independent variables were included in all the regressions: student gender, three race/ethnicity contrasts, and two school urbanicity contrasts. When the analysis involved educational outcomes (entering a postsecondary school; credits earned; completing a program of study), the type of postsecondary institution entered was also included in the regressions. When the analysis involved employment/income outcomes (current employment; consistent employment; income in 1999), the type of postsecondary education (PSE) completed was included in the analysis because both employment and income may be affected by attending postsecondary school.

The analyses also included certain interactions. The interactions of gender and race with attainment groups, and gender and race with engagement, were also included in the analysis.

Significant interactions would indicate that the effects of academic risk or behavioral risk varied across the subgroups (i.e., males and females, or different racial/ethnic groups). The interactions of PSE with attainment groups and PSE with engagement were included in analyses of employment/income outcomes to see if academic risk or behavioral risk had differential relationships to employment depending on postsecondary school experiences.

Each regression analysis was performed in two steps: First, school engagement and attainment groups were tested in a “main-effects-only” model. Interactions were tested in a second model that included main effects and interactions. Cases missing a value on one or more variables were excluded from all analyses involving the particular variable(s).

A type I error rate of $\alpha = .05$ was used throughout the analysis. In all tests of two or more effects (two or more contrasts, or two or more engagement measures), individual effects were examined only when the overall (“omnibus”) test was significant at the .05 level. A Wald test (Wald 1943) was used to decide overall significance. This 2-step procedure, referred to as “Fisher’s protected *t*-tests,” provides additional protection against type I errors when several statistical tests are performed (see Cohen 2001, chapter 13).

Strength-of-Effect Measures

Tests of significance reveal whether a relationship between variables is statistically reliable, but tell little about whether effects are weak or strong. Thus, strength-of-effect measures were obtained from the regressions for all statistically significant effects. Particular strength-of-effect measures were chosen depending on the measurement scales involved.⁶⁷

When the dependent variable was dichotomous (e.g., entering postsecondary education), odds ratios were computed. If the independent variable was also categorical (e.g., groups A and B), the ratio was the odds that a member of group A would enter postsecondary schooling divided by the odds that a member of group B would enter. For example, in comparing males to females, the odds ratio is the odds of males entering postsecondary education divided by the odds of females entering. Odds ratios much below 1.0 or much above 1.0 indicate strong effects; 1.0 would be obtained if the odds for both groups were the same. When the independent variable was continuous (e.g., engagement variable *x*), the odds ratio was the *change in odds* associated with a one-standard deviation change in *x*.

When the dependent variable was continuous (e.g., postsecondary credits earned) and the independent variable was categorical, effect sizes were computed. This is the estimated difference between the mean number of credits for population A (males) and mean number for population B (females), divided by the standard deviation of the dependent variable (credits).⁶⁸ The effect size is interpreted as the number of standard deviations separating the means of the two groups. Whether an effect size is “small,” “moderate,” or “large” depends on the variables being studied and the research context. However, general guidelines for interpreting effects have been given by Cohen (1988), who recommended that effect sizes of 0.2 or less should be

⁶⁷ More information about strength-of-effect measures in particular contexts is given in chapters 3 and 4.

⁶⁸ The standard deviation was estimated by the square root of the residual mean square from the regression analysis.

considered small, those around 0.5 medium, and those of 0.8 or greater should be considered large. This report has adopted these conventions.

When the dependent variable was continuous and the independent variable was also continuous, standardized regression coefficients were computed. This is the number of standard deviations change in the dependent variable associated with a one-standard-deviation increment in x .

In all analyses, the strength-of-effect measures were computed from a “reduced” regression model that included only the main effects (that is, without interactions). This was done for consistency within and between analyses after it was found that most interactions were not statistically significant. Of those that were significant, some were based on small numbers of observations and some did not contradict the overall findings for the particular independent variables. When an interaction showed that a particular effect was significant for one group of participants (e.g., one racial/ethnic group) but not for others, this is discussed in the report.

Special Considerations Required by the Data Set

Two aspects of the NELS:88 data required special attention. First, sampling weights were used in the analysis so that the weighted sample was representative of the larger population from which participants were drawn; these took into account oversampling of some population subgroups (Hispanic students, Asian/Pacific Islanders, and students attending private schools), and student nonresponse.⁶⁹ All results presented in this report, with the exception of actual sample sizes, are weighted.

Second, the sampling design of NELS:88 involving sampling strata, schools within strata, and students within schools, complicates the problem of estimating full-population variances and standard errors. The variance of scores for the sample is biased downward because of “clustering,” that is, students within schools within strata are more homogeneous on any characteristic than would be a simple random sample of students from across the country. Several approaches to estimating population variances for complex surveys are available, among them the “Taylor series” approach (Binder 1983; Lee, Forthofer, and Lorimor 1989) incorporated in statistical packages such as SUDAAN (Research Triangle Institute 2001) and AM (Cohen et al. 2003).

The AM program was used for all significance tests. It accepts sampling weights and performs multiple regression analysis and logistic regression, producing correct standard errors for all effects; AM accepts identifiers for the sampling stratum and the primary sampling unit (school) as input, in addition to the data. Omnibus tests of sets of predictor variables, for example, several contrasts among racial/ethnic groups, are provided in the form of Wald statistics (Wald 1943); these are compared to percentage points of chi-square distributions.

Descriptive statistics including frequency distributions, plots of the data, and correlations were obtained with the SPSS program, also using the sampling weights. Statistical tests of

⁶⁹ NELS:88 fourth follow-up panel weight F4PNLWT was used which was created to correct for unequal sampling and nonresponse in the five-wave sample.

correlations were computed using the regression features of AM with one dependent variable and one predictor variable at a time.

3. High School Attainments and Young Adult Outcomes

Status Risk and Non-Status Risk Students

How are students at risk due to status characteristics different from non-risk students? In tables 2 and 3, the full sample is classified by the two status risk criteria (home SES and school SES). Table 2 shows that 52 percent of status risk students were female, compared to 49 percent of non-risk students. Approximately two out of five status risk students were minorities (44 percent minority; 56 percent White), compared to one in five non-status risk students (20 percent minority; 80 percent White). Asian/Pacific Islander students comprised a higher percentage of the non-status risk group than the status risk group (4 percent and 2 percent, respectively), the only minority population to have this pattern. Ninety-eight percent of status risk students attended public schools, whereas 83 percent of non-status risk students attended public schools. And 42 percent of status risk students attended rural schools, compared to 29 percent who attended urban schools and 29 percent who attended suburban schools.

Table 3 summarizes home-related characteristics, including parents' education and household income that are components of the base-year SES composite. Nineteen percent of parents of status risk students completed more than a high school education, lower than all three groups of non-status risk students including those from low-SES homes but high-SES schools (24 percent). Forty-six percent of the families of status risk students were earning more than \$19,999 in 1988, again lower than all three groups of non-status risk students including those from low-SES homes but high-SES schools (63 percent).

Status risk students were different from non-status risk students in other ways. A lower percentage of status risk students than students not at risk was living with both biological parents,⁷⁰ and a higher percentage of status risk students came from a non-English-speaking home. Status risk students had more siblings than did non-status risk students, and had greater school mobility than did non-status risk students.

On six of the seven indicators listed in table 3 (all except school changes), conditions were more adverse for status risk students than for *any* non-status risk group. In particular, status risk students had more adverse conditions than those from low-SES homes but who attended higher-SES schools. These findings are consistent with the research showing that attending a low-SES school is itself a status risk factor (e.g., Lee, Croninger, and Smith 1997; Lippman, Burns, and McArthur 1996; Rumberger and Thomas 2000).

⁷⁰ Approximately 21 percent of status risk students were living with a mother only, the most common alternative setting. An additional 13 percent were living with a mother and male guardian.

Table 2. Percentage distribution of status risk sample and non-status risk students, by selected demographic and school characteristics: 1988

Group	Percentage of status risk sample	Percentage of non-status risk students			
	Low-SES home Low-SES school	All	Low-SES home High-SES school	High-SES home Low-SES school	High-SES home High-SES school
Total	100.0	100.0	100.0	100.0	100.0
Gender					
Male	47.9	50.6	48	50	52.7
Female	52.1	49.4	52	50	47.3
Race/ethnicity					
White, not Hispanic	55.9	80.3	76	74	87.0
Black, not Hispanic	20.9	8.1	10	13	4.0
Hispanic	18.8	6.5	11	7	4.1
Native American, Alaska Native	2.3	1.0	0.72 !	2.2 !	0.3 !
Asian, Pacific Islander	2.1	4.1	3	5	4.5
School urbanicity - 8th grade					
Urban	29.4	24.0	18	29	24.0
Suburban	28.6	51.1	54	31	62.7
Rural	42.0	24.9	28	40	13.2
School type - 8th grade					
Public	97.8	83.0	85.0	96.9	72.9
Catholic	2.0	10.4	12.3	2.3	14.6
Other private ¹	0.2 !	6.6	2.8	0.8 !	12.5

! Interpret data with caution. Unweighted $n < 30$.

¹Includes 'private other religion' and 'private non-religious.'

NOTE: Status risk classification based on eighth grade (base year) student and school socioeconomic status. Detail may not sum to totals because of rounding. Standard errors are given in appendix B, table B-2.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table 3. Status risk sample and non-status risk students, by selected home-related characteristics: 1988

Characteristic	Status risk sample		Non-status risk students			
	Low-SES home Low-SES school		All	Low-SES home High-SES school	High-SES home Low-SES school	High-SES home High-SES school
Percent 1987 annual household income over \$19,999 ¹	46.3		87.1	63.1	91.6	97.3
Percent father's education beyond high school ^{2,3}	19.4		63.7	23.9	69.9	81.2
Percent mother's education beyond high school ²	19.2		59.2	24.3	67.5	72.7
Percent living with two biological parents ²	56.1		71.8	67.5	70.3	75.3
Percent non-English speaking home ⁴	19.5		8.5	13.4	8.6	5.7
Mean number of siblings ¹	2.7		2.1	2.4	2.0	2.0
Mean number of times changed schools ¹	1.3		1.1	1.1	1.2	1.1

¹Base year parent questionnaire.

²Base year student questionnaire.

³Response rate on this variable less than 85 percent.

⁴Composite of base year student and teacher questionnaire.

NOTE: Status risk classification based on eighth grade (base year) student and school socioeconomic status. Standard errors are given in appendix B, table B-3.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Status Risk Students

The remainder of the analysis focused on just those students identified as at risk due to status characteristics. Diversity was apparent on many accomplishments by the time the participants were young adults (age 26). Forty-two percent reported that they were married as of the year 2000; 58 percent reported that they had one or more children; and 33 percent reported that they owned their own homes, while 19 percent were still living with their parents.⁷¹

Three Attainment Groups/Academic Risk

Status risk students were classified into one of three attainment groups based on high school outcomes: self-reported school grades, achievement test scores, and whether or not students graduated from high school.⁷² Successful completers graduated from high school on time, received acceptable grades, and attained reasonable scores on standardized reading and mathematics tests. Marginal completers graduated on time or by the NELS:88 third follow-up (1994), but had lower grades and/or test scores. Noncompleters left high school without graduating.⁷³ The attainments were considered to be academic risk factors with respect to postsecondary education and employment.

The gender and racial/ethnic composition of the attainment groups are shown in table 4.⁷⁴ Fifty-six percent of successful completers, 51 percent of marginal completers, and 51 percent of noncompleters were female. Seventy-five percent of successful completers were White, compared to 49 percent of marginal completers and 55 percent of noncompleters. Black and Hispanic students constituted 10 and 11 percent of successful completers, respectively. There was a greater percentage of Black and Hispanic students among marginal completers (26 and 20 percent, respectively) and among noncompleters (19 and 22 percent) than among successful completers. Asian/Pacific Islander students constituted 3 percent and 2 percent of successful and marginal completers, respectively, and 1 percent of noncompleters.

Postsecondary Education. Sixty-one percent of status risk students entered some form of postsecondary education (table 5). However, the attainment groups were distinct on all measures of postsecondary schooling—entering a postsecondary program, earning postsecondary credits, and completing a postsecondary program of study. The overall test of differences among the three attainment groups was statistically significant for every measure. Further, specific contrasts between successful completers and marginal completers, or between marginal completers and noncompleters, or both, were significant for every postsecondary education subgroup (table C-2, appendix C).

Of successful completers, 83 percent entered some form of postsecondary institution, compared to 68 percent of marginal completers and 29 percent of noncompleters. Almost half of successful completers (48 percent) entered a 4-year college or university. Additionally,

⁷¹ Values not tabled.

⁷² See “High School Attainments/Academic Risk,” in chapter 2 for complete details.

⁷³ Some noncompleters were still in school at the second follow-up (1992) but not in twelfth grade, and had not graduated by the third follow-up in 1994.

⁷⁴ Unweighted sample sizes for demographic subgroups are given in table C-1, appendix C.

33 percent of successful completers entered 2-year colleges (mostly community colleges). Two percent of successful completers entered less-than-2-year programs (e.g., specialized vocational programs in business, technology, or cosmetology).

Among marginal completers and noncompleters, 2-year schools were the institutions of choice (43 percent and 22 percent respectively). Six percent of marginal completers and 5 percent of noncompleters chose less-than-2-year programs that offered training in job-related skills. This was about 1 in 6 of noncompleters who entered postsecondary schooling (5 percent out of 29 percent).

The number of credits earned in postsecondary schooling is one indicator of persistence. Although credits are best understood in relation to the type of institution (Adelman 1999), differences among the attainment groups were considerable regardless of the type of school entered.⁷⁵ Among students who entered postsecondary programs, successful completers acquired more credits than did marginal completers in 2-year schools; the mean numbers of credits were 68.2 and 40.0, respectively (table 5), or a ratio of 1.7-to-1.⁷⁶ In 4-year colleges, the means were 102.3 and 76.0, respectively, or a ratio of 1.3-to-1.

Table 4. Percentage distribution of status risk students in each attainment group, by gender and race/ethnicity: 1988

Group	Percentage in each attainment group		
	Successful completers ¹ (n = 874)	Marginal completers ² (n = 1950)	Noncompleters ³ (n = 678)
Total	100.0	100.0	100.0
Gender			
Male	43.6	49.2	49.0
Female	56.4	50.8	51.0
Race/ethnicity			
White, not Hispanic	74.7	48.6	55.0
Black, not Hispanic	10.2	26.2	19.0
Hispanic	11.3	20.4	21.6
Native American, Alaska Native	1.1 !	2.4	3.1 !
Asian, Pacific Islander	2.7	2.4	1.3 !

! Interpret data with caution. Unweighted $n < 30$.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

NOTE: Detail may not sum to totals because of rounding. Standard errors are given in appendix B, table B-4.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

⁷⁵ Overall differences were all statistically significant (table 5) and seven out of eight individual contrasts were also significant (table C-2).

Table 5. High school attainment groups of status risk students, by postsecondary education outcomes: 2000

Outcome	High school attainment group			
	All	Successful completers ¹	Marginal completers ²	Noncompleters ³
Percent who entered a postsecondary institution* ⁴	60.8	83.3	67.6	29.2
< 2-year school*	4.8	1.7 !	6.0	5.0
2-year school*	35.0	33.3	42.6	21.6
4-year school*	21.0	48.3	18.9	2.7 !
Mean credits earned in postsecondary institutions* ^{5,6,7}	58.8	87.8	49.4	17.0
< 2-year school*	30.7	45.0 !	33.4	20.7
2-year school*	43.2	68.2	40.0	15.1
4-year school*	89.1	102.3	76.0	31.2 !
Percent completed postsecondary education* ⁶	47.0	57.6	44.2	35.0
Certificate/license*	16.5	7.3	18.6	29.0
Associate's degree*	11.8	12.0	13.1	4.9 !
Bachelor's degree or higher*	18.8	38.3	12.4	1.1 !

! Interpret data with caution. Unweighted $n < 30$.

*Overall test of differences among groups significant at $p < .05$; see table C-5 in appendix C for specific comparisons.

¹Defined as: in school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Defined as: test scores not "reasonable" and/or grades not passing; high school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Classified by type of first institution attended. Percentages based on total number of successful completers, marginal completers, and noncompleters in status risk sample.

⁵Credits earned from all schools attended, classified by type of first institution attended.

⁶Percentage based on total number of successful completers, marginal completers, and noncompleters who entered postsecondary education.

⁷Response rate on this variable less than 85 percent.

NOTE: Detail may not sum to totals because of rounding. Standard errors are given in appendix B, table B-5.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

⁷⁶ These ratios are presented to illuminate the magnitude of differences between the means in table 5.

Marginal completers acquired more credits than did noncompleters in all three types of schools. In less-than-2-year schools, the mean number of credits completed by marginal completers and noncompleters were 33.4 and 20.7, respectively, or a ratio of 1.6-to-1. In 2-year schools the ratio was 2.6-to-1, and in 4-year schools the ratio was 2.4-to-1.⁷⁷ Two-year schools were the most common alternative for marginal completers and noncompleters, but noncompleters earned just 38 percent of the number of credits earned by marginal completers.⁷⁸

Among students who entered postsecondary schooling, 58 percent of successful completers finished with a certificate or diploma, whereas 44 percent of marginal completers and 35 percent of noncompleters finished with a certificate or diploma. The rates for marginal completers and noncompleters were both lower than that of successful completers.⁷⁹

Table 5 also indicates the type of certificate or diploma acquired. Of successful completers who finished postsecondary schooling, approximately two-thirds (66 percent) attained bachelor's degrees. This represents 38 percent of all successful completers.⁸⁰ Marginal completers who finished postsecondary programs were distributed across the three types of credentials (42 percent certificate, 30 percent associate's degree, 28 percent bachelor's degree or higher).⁸¹ Eighty-three percent of noncompleters who finished postsecondary schooling attained certificates or licenses in particular skill areas.⁸²

Academic risk, represented by the attainment group characteristics of high school grades, test scores, and graduation, is related to persistence (or nonpersistence) in postsecondary schooling in the form of earning credits and completing a program of study.

Employment and Income. Employment outcomes for the three attainment groups are summarized in table 6; specific comparisons are given in table C-3 (appendix C). In terms of current employment, the difference between marginal completers and noncompleters was statistically significant; the odds ratio of 0.53 reflected the lower employment rate of noncompleters (table C-3). Successful completers, however, were not measurably different from marginal completers. That is, employment 8 years after high school was related to high school graduation but not to grades or test scores (the characteristics that distinguish marginal completers from successful completers).

The consistent employment index is a measure of the individual's persistence in the work force and full-time/part-time status in 1997–1999. At the extremes, 0.0 indicates no employment during the 3-year period, and 3.0 indicates 3 years of full-time employment. Values between

⁷⁷ The sample size for noncompleters in 4-year schools is below 30; this ratio should be interpreted with caution.

⁷⁸ That is, $1 \div 2.6$.

⁷⁹ Completion rates were also computed for each type of school entered. Seventy-five percent of participants who entered short-term (less-than-2-year) programs completed their studies, compared to 39 percent of those who entered 2-year programs, and 54 percent of those in 4-year schools. The lowest completion rate occurred in 2-year schools, which is the most common route taken by status risk students (35 percent of status risk students entered 2-year schools; table 5).

⁸⁰ Thirty-eight percent is approximately two-thirds of the 58 percent who finished.

⁸¹ That is, 19 percent, 13 percent, and 12 percent out of the 44 percent who finished.

⁸² Twenty-nine percent out of the 35 percent who finished.

these indicate fewer calendar years of full-time employment and/or one or more years of part-time work.⁸³

For all students combined, and for students with no postsecondary education, consistent employment was related to high school attainment (table 6). For these groups, the consistent employment index was greatest for successful completers, lower for marginal completers, and lowest for noncompleters. For the full sample, the difference between successful completers (mean index = 2.6) and marginal completers (mean index = 2.5) was small (effect size = 0.12σ ; table C-3). The difference between marginal completers and noncompleters was about three-tenths of a standard deviation (effect size = 0.31σ ; table C-3). For students with no postsecondary education, the effect sizes were 0.26σ and 0.30σ , respectively. For students who completed a postsecondary program of any type, however, high school attainment was not discernably related to consistent employment.^{84,85}

In 1999, the median annual income of non-status risk NELS:88 participants was \$25,000 and the median income of status risk participants was \$22,000 (table 6). However, several groups of status risk participants had incomes at least as high as those not at risk, namely, successful completers who acquired associate's degrees or bachelor's degrees, and marginal completers who acquired bachelor's degrees.

The incomes of attainment groups differed significantly in one way: for the entire status risk sample, successful completers, who attained high grades and test scores and graduated from high school, had higher incomes than other attainment groups at age 26 (effect size = 0.18σ ; table C-3).⁸⁶ When the sample was subclassified by postsecondary education outcomes, the incomes of the three attainment groups were not discernably different.⁸⁷

⁸³ See "Employment and Income" in chapter 2 for further details.

⁸⁴ These students also spent more years in school, leaving them less opportunity for long-term employment.

⁸⁵ As a follow-up analysis, the attainment groups were also compared for a combined group of all students who completed postsecondary programs (certificates and associate's degrees and bachelor's degrees); this test had greater power than tests on the individual groups. Both the overall difference and the individual contrasts remained nonsignificant.

⁸⁶ The statistical test used mean log income in dollars.

⁸⁷ The larger sample size associated with "all participants" may have increased the likelihood of detecting a relatively small effect.

Table 6. High school attainment groups of status risk students, by employment/income outcomes: 2000

Outcome	High school attainment group			
	All	Successful completers ¹	Marginal completers ²	Noncompleters ³
Percent currently employed (2000)*	84.0	88.3	86.1	76.7
Percent employed full-time (2000) ⁴	89.7	89.3	89.7	89.9
Mean number of hours worked per week (1999) ⁵	42.4	41.6	42.3	43.6
Consistent employment mean 1997–1999 (all)* ⁶	2.46	2.62	2.51	2.24
No postsecondary education*	2.35	2.71	2.46	2.17
Some postsecondary education, no degree	2.54	2.61	2.57	2.33
Certificate/license	2.43	2.63	2.39	2.46
Associate's degree	2.64	2.67	2.64	2.57 !
Bachelor's degree or higher	2.53	2.55	2.51	2.55 !
Median 1999 annual income (all; in thousands)* ⁵	22.0	25.0	22.0	20.0
No postsecondary education	22.0	26.0	22.0	22.0
Some postsecondary education, no degree	22.0	23.0	21.0	22.0
Certificate/license	20.0	24.0	20.0	19.0
Associate's degree	23.0	28.0	20.0	28.0 !
Bachelor's degree or higher	27.0	27.0	28.0	23.0 !

! Interpret data with caution. Unweighted $n < 30$.

*Overall test of differences among groups significant at $p < .05$; see table C-6 in appendix C for specific comparisons.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Of those currently employed.

⁵Of those employed in 1999; annual income data were only available for 1999.

⁶0.0 to 3.0 indicator of part-time/full-time employment 1997–1999. Two decimal places shown for accuracy.

NOTE: Standard errors are given in appendix B, table B-6.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Question (1.1) Academic Risk and Postsecondary Education: Are Attainments in High School Related to Postsecondary Education Among Status Risk Students?

Regression analyses were conducted to examine the relationship of high school attainments with postsecondary schooling in a more complete context—that is, in analyses that included students’ demographic characteristics and the type of postsecondary institution attended. The regression results are summarized in table 7; strength-of-effect measures are given in table 8. Each column of the tables gives results for one of three indicators of postsecondary schooling: entering a postsecondary institution and, for those who did, the number of credits earned and whether or not a degree or certificate was acquired.

The rows of tables 7 and 8 indicate particular independent variables. For variables with more than two classifications (race; urbanicity; type of institution; attainment group), an overall test was conducted first to indicate whether there were any differences among the groups represented.⁸⁸ If the overall test was significant, specific contrasts among the groups were then tested.

Gender, race/ethnicity, urbanicity, and the type of program entered were primarily control variables; the type of institution entered was a control variable for outcomes connected to program duration (credits; completion). The interactions of attainment groups with gender and race were examined to see if the relationship of attainment groups with postsecondary schooling varied across gender or racial/ethnic groups.

Strength-of-effect measures (table 8) are given in two forms, effect sizes and odds ratios. Effect sizes are given for the continuous dependent variable, number of credits earned. An effect size is the number of standard deviations between the means of the two groups being compared, for example, between male and female students. Effect sizes are positive if the mean of the first group (e.g., males) is higher and negative if the mean of the second group (females) is higher. Odds ratios are given for the yes/no dependent variables entering a postsecondary institution and completing a program of study. The odds of a “yes” for the first group⁸⁹ (e.g., males) are divided by the odds for the second group (females). The odds ratio is less than 1.0 if the odds for the first group are less than the odds for the second, and greater than 1.0 if the odds for the first group are greater than the odds for the second.

Background Variables. The results for gender, race/ethnicity, school urbanicity, and type of postsecondary institution, with high school attainment in the analysis, are given in tables 7 and 8 for the full status risk sample. There were significant gender differences only for entering a postsecondary school (table 7). Males had about 0.66 of the odds that females had of entering a postsecondary school (table 8); stated another way, the odds of a female entering postsecondary schooling were about 1 1/2 times greater than the odds that a male would enter ($1 \div 0.66$). There were no discernable gender differences in persistence, measured either as credits earned or program completion.

⁸⁸ Using a Wald statistic; see “Data Analysis.”

⁸⁹ The “odds” is the ratio of the proportion of “yes’s” to the proportion of “no’s.”

Table 7. Regression results for high school attainment groups and postsecondary education outcomes: 2000

Predictor variable	Entering a postsecondary institution	For those who entered postsecondary education	
		Number of credits earned ¹	Completing a program of study
Gender (M - F)	-0.42 * (0.126)	-4.66 (2.650)	-0.23 (0.124)
Race/ethnicity			
Black - White	0.31 (0.214)	-5.36 (4.468)	-0.42 (0.201)
Hispanic - White	0.57 * (0.287)	-5.18 (5.668)	-0.30 (0.213)
Native American - White	-0.49 (0.165)	-14.01 * (3.342)	-0.47 (0.162)
Asian - White	1.33 * (0.327)	15.44 * (6.131)	-0.11 (0.465)
School urbanicity - 8th grade			
Suburban - Urban	-0.20 (0.182)	0.93 (3.526)	-0.05 (0.189)
Rural - Urban	-0.29 (0.184)	7.56 * (3.456)	0.20 (0.171)
Type of postsecondary institution entered			
< 2-year - 2-year	†	-5.72 (3.020)	1.70 * (0.222)
4-year - 2-year	†	35.16 * (3.633)	0.40 * (0.136)
Attainment group			
(A1) Successful completers - Marginal completers	0.98 * (0.238)	24.25 * (3.483)	0.39 * (0.131)
(A2) Noncompleters - Marginal completers	-1.65 * (0.151)	-24.48 * (2.487)	-0.51 * (0.242)

See notes at end of table.

Table 7. Regression results for high school attainment groups and postsecondary education outcomes: 2000—Continued

Predictor variable	Entering a postsecondary institution	For those who entered postsecondary education	
		Number of credits earned ¹	Completing a program of study
Gender x Attainment Group			
Gender x (A1)	-0.36 (0.363)	-11.22 (5.566)	-0.11 (0.245)
Gender x (A2)	0.36 (0.312)	-10.00 (5.144)	0.76 (0.472)
Race/ethnicity x Attainment Group			
Black x (A1)	-1.91 * (0.765)	12.02 (12.589)	0.85 (0.458)
Black x (A2)	-0.38 (0.431)	11.82 (9.881)	0.08 (0.658)
Hispanic x (A1)	0.53 (0.484)	6.52 (7.991)	0.03 (0.328)
Hispanic x (A2)	-0.64 (0.356)	8.89 (5.145)	-0.71 (0.613)
Native American x (A1)	-1.62 (0.940)	-11.47 (15.100)	-0.24 (0.707)
Native American x (A2)	0.11 (0.710)	-10.68 (12.414)	-18.36 !* (1.049)
Asian x (A1)	-0.08 (0.745)	0.19 (10.747)	0.38 (0.561)
Asian x (A2)	-1.48 * (0.654)	8.50 (21.692)	-0.19 (0.811)

† Not applicable.

! Interpret data with caution. Interaction based on small sample (five Native American/Alaska Native noncompleters of which none completed a postsecondary program).

* $p < .05$

¹Response rate on this variable less than 85 percent.

NOTE: Table contains unstandardized regression coefficients. Standard errors in parentheses. Each coefficient is a contrast, group A-minus-group B (positive if group A has the higher value; negative if group B has the higher value). For effects with two or more contrasts, individual contrasts tested only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table 8. Strength-of-effect measures for high school attainment groups and postsecondary education outcomes: 2000

Predictor variable	Entering a postsecondary institution ¹	For those who entered postsecondary education	
		Number of credits earned ^{2,3}	Completing a program of study ¹
Gender (M - F)	0.66 *	-0.10 σ	0.80
Race/ethnicity			
Black - White	1.36	-0.12 σ	0.66
Hispanic - White	1.77 *	-0.12 σ	0.74
Native American - White	0.61	-0.31 σ *	0.62
Asian - White	3.76 *	0.34 σ *	0.90
School urbanicity - 8th grade			
Suburban - Urban	0.82	0.02 σ	0.95
Rural - Urban	0.75	0.17 σ *	1.22
Type of postsecondary institution entered			
< 2-year - 2-year	†	-0.13 σ	5.46 *
4-year - 2-year	†	0.78 σ *	1.50 *
Attainment group			
(A1) Successful completers - Marginal completers	2.66 *	0.54 σ *	1.47 *
(A2) Noncompleters - Marginal completers	0.19 *	-0.55 σ *	0.60 *

† Not applicable.

* $p < .05$ ¹Odds ratio for specific predictor variable.²Effect sizes; mean differences in standard deviation units.³Response rate on this variable less than 85 percent.

NOTE: Strength-of-effect measures estimated for main effects only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Racial/ethnic differences were found for entering postsecondary schooling and for number of credits earned. Among status risk students (low-SES homes, low-SES schools) Hispanic students were more likely to enter a postsecondary program than were non-Hispanic White students. Native American/Alaska Native students who entered postsecondary education earned fewer credits than did Whites. Asian/Pacific Islander students were more likely to enter a postsecondary program and earned more postsecondary credits compared to White students.

The type of postsecondary institution was related to the number of credits earned and to the likelihood of students' completing their programs of study. The odds of a student's completing a less than 2-year program culminating in a job-related certificate or license were over five times greater than the odds of completing a 2-year degree (odds ratio = 5.46; table 8). The odds of students completing a 4-year program were one and one-half times greater than the

odds of completing a 2-year program (odds ratio = 1.47). In general, students entering 2-year colleges were least likely to complete any program of study.⁹⁰

Academic Risk/High School Attainment Groups. Attainment groups differed on all indicators of postsecondary education (table 7). In terms of entering a postsecondary program, the odds of successful completers entering were over two and one-half times greater than the odds of marginal completers entering a program (odds ratio = 2.66; table 8). Marginal completers had about five times the odds of entering any kind of program compared to noncompleters ($1 \div 0.19 = 5.26$).

In terms of persistence in a postsecondary program, the groups were ordered the same way (table 8). Successful completers earned more credits than did marginal completers and marginal completers earned more credits than did noncompleters. Both differences were approximately equal to one-half standard deviation (effect sizes = 0.54σ and 0.55σ , respectively). The odds of completing a program of study were almost one and one-half times greater for successful completers than for marginal completers (odds ratio = 1.47), and about one and two-thirds times greater for marginal completers than for noncompleters ($1 \div 0.60$).

Interactions. The interactions of gender and race with attainment groups were tested to determine if the differences in postsecondary education among attainment groups varied across gender or racial/ethnic groups. There were no significant interactions of gender with attainment groups on any postsecondary education measure studied.

The interaction of race/ethnicity with attainment groups was significant for entering postsecondary education (among Black and Asian/Pacific Islander students) and for completing a program of study (among Native American/Alaska Native students). For entering postsecondary education, follow-up analyses⁹¹ indicated that there were differences between successful completers and marginal completers only among White and Hispanic students; no discernable differences were found between successful completers and marginal completers among Black, Asian/Pacific Islander, or Native American/Alaska Native students. The general finding that successful completers enter postsecondary education at a higher rate than do marginal completers does not apply to these racial/ethnic groups. Marginal completers of all five race/ethnicities had higher rates of entering postsecondary education than did noncompleters, however.

For completing a program of study, the only significant interaction was for Native American/Alaska Native students, but the sample included just five Native American/Alaska Native noncompleters; none completed a postsecondary program. When the particular interaction was removed from the analysis, all tests of the interaction of race/ethnicity with attainment groups for completing a program of study were nonsignificant.

Summary. In sum, in terms of entering postsecondary programs of study, successful completers had higher entrance rates than did marginal completers, but only among White and Hispanic status risk students. Successful completers had consistent advantages over marginal

⁹⁰ Information on program completion was taken from respondents' self-reports at the time of the NELS:88 fourth follow-up (2000), and indicates the completion of any postsecondary program up to that time.

⁹¹ Not shown in tables.

completers in accruing postsecondary credits and completing a program of study. Noncompleters—students differentiated by their high academic risk—were the least likely of the three groups to enter or persist in postsecondary schooling.

Question (1.2) Academic Risk and Employment: Are Attainments in High School Related to Later Employment and Income Among Status Risk Students?

Analyses were conducted to examine the relationship of high school attainments with employment and income, in regressions that included students' demographic characteristics and type of postsecondary education completed, if any. The regression results for employment and income are summarized in table 9; strength-of-effect measures are given in table 10. Each column of the tables gives results for one measure of employment/income: whether the respondent was employed for pay (full-time or part-time) in 2000, an index of consistent employment during 1997-1999, and, for those who were employed for pay in 1999,⁹² their annual income. The strength-of-effect measures in table 10 are odds ratios for the yes/no employed-in-2000 variable, and effect sizes (mean differences in standard deviation units) for consistent employment and 1999 annual income.⁹³

Background Variables. Gender differences favored males on all three employment/income variables (table 9). The odds of status risk males being employed in 2000 were about 3 times greater than the odds of status risk females being employed (odds ratio = 3.20; table 10). Further, the mean of the consistent employment index for males was approximately one-half standard deviation above that of females. And finally, in 1999, males were earning an income that was approximately one-half of a standard deviation greater than that of females (median incomes of \$26,000 for males and \$19,000 for females).⁹⁴

Background Variables. Gender differences favored males on all three employment/income variables (table 9). The odds of status risk males being employed in 2000 were about 3 times greater than the odds of status risk females being employed (odds ratio = 3.20; table 10). Further, the mean of the consistent employment index for males was approximately one-half standard deviation above that of females. And finally, in 1999, males were earning an income that was approximately one-half of a standard deviation greater than that of females (median incomes of \$26,000 for males and \$19,000 for females).⁹⁵

Differences were found in annual income by race/ethnicity, however. The incomes of Black and White young adults differed by about four-tenths of a standard deviation (effect size = 0.44σ ; table 10); the incomes of Native American and White young adults differed by about the same amount (effect size = 0.42σ). The median 1999 income of Whites was \$24,000, compared to \$19,000 for Blacks, \$15,600 for Native Americans, and \$22,000 for Hispanics. The disparities in income found among racial/ethnic groups on the whole (DeNavas-Walt et al. 2003) also characterized these low-SES respondents. The disparities were not explained by academic

⁹² That is, for respondents who reported working one or more hours for pay in a typical week in 1999 (NELS:88 variable F4BLHPW).

⁹³ See "Strength-of-Effect Measures" in chapter 2 for more discussion of effect sizes and odds ratios.

⁹⁴ Median incomes not tabled.

⁹⁵ Median incomes not tabled.

risk; they were statistically significant with educational attainment groups included in the regressions.

Table 9. Regression results for high school attainment groups and employment/income outcomes: 2000

Predictor variable	Employed in 2000	Consistent employment ¹	1999 Annual income ^{2,3}
Gender (M - F)	1.16 *	0.42 *	0.41 *
	(0.180)	(0.052)	(0.060)
Race/ethnicity			
Black - White	-0.12	-0.10	-0.33 *
	(0.234)	(0.071)	(0.082)
Hispanic - White	0.07	-0.06	-0.01
	(0.175)	(0.060)	(0.053)
Native American - White	-0.56	-0.40	-0.32 *
	(0.280)	(0.195)	(0.116)
Asian - White	0.24	-0.13	-0.10
	(0.302)	(0.104)	(0.091)
School urbanicity - 8th grade			
Suburban - Urban	-0.01	0.07	0.02
	(0.197)	(0.067)	(0.065)
Rural - Urban	0.09	0.08	-0.05
	(0.197)	(0.063)	(0.060)
Postsecondary education completed			
Some PSE, no degree - None	0.43 *	0.14 *	0.03
	(0.201)	(0.060)	(0.071)
Certificate/License - None	0.77 *	0.12	-0.01
	(0.257)	(0.116)	(0.111)
Associate's degree - None	2.18 *	0.22 *	0.13
	(0.393)	(0.064)	(0.070)
Bachelor's degree or higher - None	1.02 *	0.10	0.32 *
	(0.219)	(0.063)	(0.067)
Attainment group			
(A1) Successful completers - Marginal completers	0.07	0.08	0.05
	(0.177)	(0.043)	(0.045)
(A2) Noncompleters - Marginal completers	-0.35	-0.23 *	-0.14
	(0.185)	(0.065)	(0.093)
Gender x Attainment Group			
Gender x (A1)	-0.20	-0.20 *	-0.13
	(0.427)	(0.091)	(0.082)
Gender x (A2)	0.63	0.32 *	0.07
	(0.368)	(0.129)	(0.160)

See notes at end of table.

Table 9. Regression results for high school attainment groups and employment/income outcomes: 2000—Continued

Predictor variable	Employed in 2000	Consistent employment ¹	1999 Annual income ^{2,3}
Race/ethnicity x Attainment Group			
Black x (A1)	1.63 *	0.05	0.22
	(0.715)	(0.154)	(0.150)
Black x (A2)	-0.08	-0.19	-0.67
	(0.520)	(0.203)	(0.353)
Hispanic x (A1)	0.85	0.15	0.05
	(0.431)	(0.105)	(0.100)
Hispanic x (A2)	0.23	0.09	0.01
	(0.432)	(0.138)	(0.113)
Native American x (A1)	0.17	0.30	-0.72
	(1.154)	(0.282)	(0.332)
Native American x (A2)	-0.38	-0.28	-0.26
	(0.693)	(0.275)	(0.296)
Asian x (A1)	-0.03	-0.16	-0.01
	(0.579)	(0.177)	(0.157)
Asian x (A2)	16.08 *	0.08	0.21
	(0.532)	(0.239)	(0.197)
Postsecondary education completed x Attainment group			
Some PSE, no degree x (A1)	-1.06	-0.25	-0.11
	(0.550)	(0.134)	(0.109)
Some PSE, no degree x (A2)	0.07	0.04	0.06
	(0.428)	(0.150)	(0.258)
Certificate/license x (A1)	-1.06	-0.07	0.14
	(0.669)	(0.197)	(0.193)
Certificate/license x (A2)	0.32	0.34	0.43
	(0.570)	(0.272)	(0.247)
Associate's degree x (A1)	-0.97	-0.26	0.02
	(0.798)	(0.143)	(0.138)
Associate's degree x (A2)	-0.08	0.14	0.22
	(1.174)	(0.212)	(0.182)
Bachelor's degree or higher x (A1)	-1.33	-0.26	-0.17
	(0.567)	(0.128)	(0.116)
Bachelor's degree or higher x (A2)	-0.63	0.53	0.20
	(1.156)	(0.339)	(0.173)

* $p < .05$ ¹0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.²Of those employed in 1999; annual income data were only available for 1999.³Log 1999 income in dollars.

NOTE: Table contains unstandardized regression coefficients. Standard errors in parentheses. Each coefficient is a contrast, group A-minus-group B (positive if group A has the higher value; negative if group B has the higher value). For effects with two or more contrasts, individual contrasts tested only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table 10. Strength-of-effect measures for high school attainment groups and employment/income outcomes: 2000

Predictor variable	Employed in 2000 ¹	Consistent employment ^{2,3}	1999 Annual income ^{4,5}
Gender (M - F)	3.20 *	0.50 σ *	0.54 σ *
Race/ethnicity			
Black - White	0.89	-0.11 σ	-0.44 σ *
Hispanic - White	1.08	-0.07 σ	-0.02 σ
Native American - White	0.57	-0.48 σ	-0.42 σ *
Asian - White	1.27	-0.15 σ	-0.13 σ
School urbanicity - 8th grade			
Suburban - Urban	0.99	-0.09 σ	0.03 σ
Rural - Urban	1.09	-0.09 σ	-0.06 σ
Postsecondary education completed			
Some PSE, no degree - None	1.53 *	0.17 σ *	0.04 σ
Certificate/license - None	2.15 *	0.14 σ	0.00 σ
Associate's degree - None	8.86 *	0.26 σ *	0.18 σ
Bachelor's degree or higher - None	2.78 *	0.12 σ	0.42 σ *
Attainment group			
(A1) Successful completers - Marginal completers	1.07	0.10 σ	0.06 σ
(A2) Noncompleters - Marginal completers	0.70	-0.27 σ *	-0.19 σ

* $p < .05$ ¹Odds ratio for specific predictor variable.²0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.³Effect sizes; mean differences in standard deviation units.⁴Of those employed in 1999; annual income data were only available for 1999.⁵Log 1999 income in dollars.

NOTE: Strength-of-effect measures estimated for main effects only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Postsecondary Education and Employment/Income. Postsecondary education was included in this analysis because of its potential impact on employment: it can delay working for months or years but it can also help an individual obtain employment. Postsecondary education was significantly related to all three employment-related outcomes (see table 9).

Current employment was associated with completion of a postsecondary program of study. Table 10 shows the strength of this relationship. A certificate or license and bachelor's degree more than doubled the odds of being employed (odds ratios = 2.15 and 2.78, respectively). An associate's degree, typically awarded by community colleges and other 2-year programs, increased the odds by a larger factor (odds ratio = 8.86).⁹⁶

Entering postsecondary education (even without completing the program) and obtaining an associate's degree were associated with greater consistency of employment. A bachelor's degree was not associated with greater consistency of employment.

A degree from a 4-year college was associated with higher income levels among students who had been at risk due to status characteristics. The median income in 1999 for young adults with a bachelor's degree was \$27,000, whereas the median was \$20,000 to \$23,000 for other levels of postsecondary education (table 6).

Academic Risk/High School Attainment Groups. No discernable differences were found among attainment groups on current employment or annual income (table 9), even though both were significant when tested in isolation in the bivariate analysis (table 6). In the bivariate analysis, the contrast between marginal completers and noncompleters was significant for current employment, and the contrast between successful completers and marginal completers was significant for income (table C-3). The bivariate analysis did not take into account gender, race/ethnicity, urbanicity, or postsecondary education. When these variables were added to the regression, the tests of attainment group differences were reduced to nonsignificance.

Differences were found between marginal completers and noncompleters on consistent employment. The magnitude of the difference between these two groups was approximately one-quarter of a standard deviation (effect size = 0.27σ ; table 10). The same contrast was significant in the bivariate analysis. Nongraduation from high school is accompanied by less persistence in employment—as is nongraduation and less persistence in postsecondary schooling.⁹⁷

Because postsecondary education may be a mediator of employment and income, follow-up regressions were conducted in which postsecondary education was omitted from the analysis. The analysis was rerun for all three employment/income measures, including all predictor variables except postsecondary education. In these analyses, five out of six comparisons of attainment group differences were statistically significant. Successful completers were more consistently employed and had higher incomes than did marginal completers. A higher percentage of marginal completers than noncompleters were employed in 2000, and marginal completers were more consistently employed and higher incomes than did noncompleters.

⁹⁶ Ninety-seven percent of respondents with associate's degrees were employed at the time of the fourth follow-up.

⁹⁷ See "Background Variables" above for postsecondary education results.

In sum, the relationships of high school attainments employment and income were attributable in large part to the role of postsecondary schooling. Successful completers more than marginal completers, and marginal completers more than noncompleters, acquire more postsecondary schooling (table 7) and subsequently experience greater employment outcomes as young adults. Only the difference between noncompleters and marginal completers in consistent employment was not explained in this way. Noncompleters—students with high status risk and high academic risk—were least likely to hold continuous employment, for reasons beyond the fact that they acquired less postsecondary education.

Interactions. Several interactions were significant in the analysis of employment and income. For employment in 2000, two particular interaction effects of race/ethnicity with attainment groups were significant. For one, Black successful completers had a higher employment rate (96 percent) than Black marginal completers (84 percent),⁹⁸ this contrasts with the overall finding of no significant association of employment with attainment groups. The second effect may be attributable to Asian/Pacific Islander noncompleters, of whom 100 percent were employed; however the group size was small ($n = 19$) and the particular result may not be reliable.

The interaction of gender with attainment group was significant for consistent employment. Attainment group differences were smaller for males than for females in general,⁹⁹ but one group stood out in particular: female noncompleters had lower consistent employment scores than all other gender-attainment combinations.

⁹⁸ Not shown in table.

⁹⁹ Not shown in table.

4. Behavioral Risk: School Engagement/Disengagement and Young Adult Outcomes

This portion of the analysis addressed the question: “Is behavioral risk, in the form of disengagement from high school, related to postsecondary schooling and employment?” All respondents in the analysis were at risk due to status characteristics, that is, home and school socioeconomic status (SES). To assess behavioral risk, four indicators of school engagement were derived from student and teacher reports: attendance and timeliness, rated by classroom teachers; class participation and completing assigned work, rated by classroom teachers; participation in extracurricular activities, reported by the student; and students’ ratings of the usefulness of school subjects for post-high school endeavors. Except for extracurricular activities, the measures were not counts of activities, but composite scales on which higher scores represented better behavior (engagement), and lower scores represented degrees of disengagement.

The relationships between engagement (behavioral risk) and high school attainments (academic risk) were examined by comparing the three attainment groups on average levels of engagement. Effect sizes revealed the magnitude of the differences between successful completers and marginal completers, and between marginal completers and noncompleters.¹⁰⁰

Two approaches were taken to studying the relationship of engagement/disengagement with adult outcomes. First, variable-by-variable relationships of engagement with adult outcomes were examined; correlation coefficients were used to show the strength of the relationships. Next, a set of multivariate regression analyses were performed to examine the relationship of engagement to adult outcomes in a more complete context. Strength-of-effect measures were obtained for each statistical relationship.

Engagement/Disengagement and Attainment Groups

The relationship between high school engagement and high school attainment was examined first, by comparing the three attainment groups on the means of the engagement variables. Table 11 gives the means, and table C-4 (appendix C) gives effect sizes and statistical significance for two specific contrasts—successful completers compared to marginal completers, and marginal completers compared to noncompleters.¹⁰¹

Both contrasts were significant for attendance, classroom behavior, and extracurricular activities (table C-4). The effect sizes were small for extracurricular activities¹⁰² (0.24σ and

¹⁰⁰ See “Strength-of-Effect Measures” in chapter 2 for more information about effect sizes.

¹⁰¹ In the “protected test” approach, the contrasts are designated as statistically significant only if the “overall” test of all differences among the three groups is found to be significant first.

¹⁰² Using Cohen’s (1988) descriptors.

0.29 σ), and moderate to large for attendance (0.40 σ and 0.82 σ) and classroom behavior (0.72 σ and 0.70 σ). In all, the attainment groups were distinct on these three measures; status risk students with higher attainments in high school are more likely to have been engaged (and less disengaged) compared to those with lower grades, lower test scores, or who drop out.

No appreciable differences among the groups were found on the usefulness measure (UTILITY), perhaps due to several factors.¹⁰³ For one, the measure was gathered when students were in eighth grade, whereas the other measures were gathered in tenth and twelfth grade. Second, the measure reflects attitudes rather than actions. Despite theory that stresses the importance of these particular attitudes (Eccles 1983; Mickelson 1990; Updegraff et al. 1996), they may have little or no relationship with actual attainments several years later.

Table 11. Mean engagement measures of high school attainment groups: 1990

Engagement measure	High school attainment group			
	All	Successful completers ¹	Marginal completers ²	Noncompleters ³
Attendance ^{4*}	3.94	4.19	3.97	3.51
Classroom behavior ^{5*}	2.35	3.23	2.28	1.35
Extracurricular participation ^{6*}	1.63	2.01	1.63	1.16
Usefulness of school subjects ⁷	3.01	3.08	3.00	2.98

*Overall test of differences among groups significant at $p < .05$; see table C-11 in appendix C for specific comparisons.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or in school not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴How often a student is absent or tardy, range: 1-5.

⁵Teacher rating of student's behavior, range: 1-4.

⁶Participation in extracurricular activities, range: 0-6.

⁷Student rating of the usefulness of math, English, social studies and science, range: 1-4.

NOTE: Standard errors are given in appendix B, table B-11.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

¹⁰³ UTILITY had low correlations with the other engagement measures (see "Variables" in chapter 2), but reasonably high internal consistency ($\alpha = 0.71$; see p.19).

Engagement/Disengagement and Adult Outcomes

The correlations between the engagement variables and adult schooling and employment are given in table 12. Due to the large number of correlations in this table, some may be significant by chance factors alone.¹⁰⁴ Nevertheless, attendance and classroom behavior had small but significant correlations with all three indicators of postsecondary schooling, that is, entering a postsecondary institution, credits earned in postsecondary institutions, and completing postsecondary education. Only the correlation of attendance with credits earned in less-than-2-year programs was not statistically significant ($r = 0.16$).

Extracurricular participation was related to all three postsecondary variables, although the correlations were small; the statistically significant correlations ranged from $r = 0.08$ to $r = 0.18$. The perceived usefulness of school subjects was related only to credits earned in postsecondary school, and only for the total sample.

Attendance was related to four indicators of employment: employment in 2000, full-time employment, and consistent employment (for the total sample and for participants who did not enter or complete any postsecondary education), and income (for the full sample). The correlations were also small, however; the significant values ranged from $r = 0.08$ to $r = 0.13$.

Classroom behavior was related negatively to hours worked ($r = -0.10$) and to the annual income of participants with no postsecondary education ($r = -0.17$). Extracurricular participation was not related significantly to any measure of employment or income. The perceived usefulness of school subjects was related negatively to consistent employment for the entire sample ($r = -0.09$) and for participants with no postsecondary education ($r = -0.20$). Of the 45 correlations of classroom behavior, extracurricular participation, and usefulness of school subjects with adult employment and income, only five were statistically significant, and those were in a direction opposite to that suggested by prior research and theory.¹⁰⁵

In all, the behavioral risk level of engagement of status risk students, that is, engagement/disengagement, is related to entering and persisting in postsecondary education. It is related less, if at all, to employment and income at age 26. At the time of the NELS:88 fourth follow-up, only one indicator of engagement—regular, on-time attendance at school and in class—was significantly related to employment as a young adult. The regression analyses examined these relationships taking into account other characteristics of the status risk sample.

¹⁰⁴ The type I error rate of .05 suggests that, of the 84 correlations in the table, approximately 4 or 5 may appear significant but do not represent real nonzero relationships.

¹⁰⁵ See “Behavioral Risk Factors: Engagement and Disengagement in School” in the Introduction.

Table 12. Correlations of engagement measures with postsecondary education and employment/income outcomes: 2000

Postsecondary outcomes	Engagement measures			Usefulness of school subjects
	Attendance	Classroom behavior	Extracurricular participation	
Student entered a postsecondary institution ^{1,2}	.167 *	.256 *	.154 *	.038
Credits earned in postsecondary institutions ^{3,4,5}	.282 *	.274 *	.175 *	.090 *
< 2-year school	.158	.218 *	.021	-.033
2-year school	.224 *	.221 *	.090 *	.034
4-year school	.225 *	.191 *	.088 *	.024
Student completed postsecondary education(all) ^{2,4}	.128 *	.126 *	.078 *	.033
Currently employed (2000) ²	.078 *	.077	.000	-.065 *
Employed full-time (2000) ^{2,6}	.078 *	.039	-.031	-.030
Number of hours worked per week (1999) ⁷	.030	-.097 *	-.038	-.016
Consistent employment 1997-1999 ⁸	.129 *	.047	-.012	-.090 *
No postsecondary education	.104 *	-.009	-.090	-.197 *
Some postsecondary education, no degree	.131 *	.060	.019	.016
Certificate/license	.176	-.025	.041	-.071
Associate's degree	.175	.099	-.043	-.121
Bachelor's degree or higher	-.003	.064	-.022	-.067
1999 annual income ⁷	.116 *	.007	.025	.033
No postsecondary education	.071	-.168 *	-.050	-.025
Some postsecondary education, no degree	.135	.087	.080	.104
Certificate/license	.063	-.001	-.060	-.040
Associate's degree	.206	.044	-.051	-.009
Bachelor's degree or higher	-.040	-.059	.007	.026

* $p < .05$ ¹Classified by type of first institution attended.²Coded 0=No, 1=Yes.³Credits earned from all schools attended, classified by type of first institution attended.⁴Of those who attended postsecondary education.⁵Response rate on this variable less than 85 percent.⁶Of those currently employed.⁷Of those employed in 1999; annual income data were only available for 1999.⁸0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Question (2.1) Behavioral Risk and Postsecondary Education: Is Engagement in High School Related to Postsecondary Education Among Status Risk Students?

Analyses were conducted to examine the relationship of engagement with postsecondary schooling in regressions that included students' demographic characteristics and the type of postsecondary education attended. The results of the regressions are summarized in table 13; strength-of-effect measures are given in table 14. Each column of these tables corresponds to a particular outcome variable: entering a postsecondary school and, for those who did enter, the number of credits earned and whether a program of study was completed. The rows of tables 13 and 14 correspond to particular independent variables. For variables with more than two classifications, and for the four engagement variables, an overall test was conducted first to indicate whether there was any relationship between the set of variables and the particular outcome measure.¹⁰⁶ If the overall test was significant, specific contrasts or specific engagement variables were then tested.

Strength-of-effect measures were obtained in several forms. Odds ratios were computed for the yes/no dependent variables entering a postsecondary institution and completing a program of study. For a categorical independent variable (e.g., gender), this was the ratio of the odds of a male belonging to a particular group (e.g., entering postsecondary schooling) to the odds of a female belonging to that group. The engagement variables were continuous. For these, the odds ratio is the change in odds associated with a one standard deviation increase in the engagement measure. For example, the odds ratio for the relationship of attendance with entering a postsecondary institution is the change in the odds of entering postsecondary schooling that accompanies a one standard deviation increase in attendance ratings.

Effect sizes were computed for the relationship of the continuous dependent variable number of credits with categorical independent variables (e.g., gender). Standardized regression coefficients were computed for number of credits and the continuous engagement measures. A standardized regression coefficient indicates the number of standard deviations change in credits associated with a one-standard-deviation increase in the particular engagement measure.

Background Variables.¹⁰⁷ In this analysis, females at status risk were more likely to enter postsecondary schooling and to complete their postsecondary studies than were males, but there were no discernable gender differences in the number of credits earned (table 13). Racial/ethnic differences were found for entering postsecondary education and for the number of credits earned. Hispanic and Asian/Pacific Islander students at status risk were more likely than Whites to enter postsecondary education (odds ratios = 2.63 and 5.09, respectively; table 14). Native American/Alaska Native students were less likely than Whites to enter postsecondary schooling (odds ratio = 0.50), and when they did, they accrued fewer credits than did Whites.

¹⁰⁶ A Wald statistic; see "Special Considerations Required by the Data Set" in chapter 2.

¹⁰⁷ The results for background variables (gender, race/ethnicity, school urbanicity, and type of postsecondary school) differ slightly from those given in the attainment-group analysis (tables 7 and 8). Each set of results depends to some extent on the other variables in the model—attainment group differences or engagement measures.

Table 13. Regression results for engagement and postsecondary education outcomes: 2000

Predictor variable	Entering a postsecondary institution	For those who entered postsecondary education	
		Number of credits earned ¹	Completing a program of study
Gender (M - F)	-0.41 * (0.141)	-3.80 (2.692)	-0.35 * (0.129)
Race/ethnicity			
Black - White	0.35 (0.204)	-5.69 (4.645)	-0.29 (0.202)
Hispanic - White	0.97 * (0.198)	-6.01 (3.847)	-0.32 (0.170)
Native American - White	-0.69 * (0.348)	-26.57 * (4.618)	-0.82 (0.432)
Asian - White	1.63 * (0.350)	7.8 (5.936)	-0.31 (0.222)
School urbanicity - 8th grade			
Suburban - Urban	0.07 (0.207)	1.18 (4.023)	-0.004 (0.192)
Rural - Urban	-0.18 (0.201)	5.56 (3.737)	0.19 (0.175)
Type of postsecondary institution			
< 2-year - 2-year	†	-7.97 * (3.787)	1.63 * (0.239)
4-year - 2-year	†	40.66 * (3.023)	0.54 * (0.138)
Engagement			
Attendance	0.34 * (0.120)	12.91 * (2.782)	0.33 * (0.133)
Classroom behavior	0.30 * (0.057)	4.43 * (1.084)	0.12 * (0.050)
Extracurricular participation	0.20 * (0.044)	1.49 (0.836)	0.04 (0.034)
Usefulness of school subjects	-0.05 (0.114)	1.52 (2.130)	0.08 (0.105)
Gender x Engagement			
Gender x Attendance	-0.26 (0.250)	2.99 (5.637)	0.17 (0.299)
Gender x Classroom behavior	0.20 (0.105)	-1.72 (2.079)	-0.08 (0.103)
Gender x Extracurricular Participation	-0.04 (0.079)	-0.12 (1.646)	-0.02 (0.069)
Gender x Usefulness of school subjects	0.35 (0.203)	5.08 (4.672)	0.06 (0.223)

See notes at end of table.

Table 13. Regression results for engagement and postsecondary education outcomes: 2000—Continued

Predictor variable	Entering a postsecondary institution	For those who entered postsecondary education	
		Number of credits earned ¹	Completing a program of study
Race/ethnicity x Engagement			
Black x Attendance	0.08 (0.349)	5.90 (7.056)	-0.08 (0.362)
Black x Classroom behavior	0.11 (0.176)	-0.58 (3.075)	0.07 (0.142)
Black x Extracurricular participation	-0.29 * (0.095)	-2.22 (2.396)	-0.10 (0.094)
Black x Usefulness of school subjects	-0.19 (0.270)	1.97 (6.584)	-0.32 (0.273)
Hispanic x Attendance	0.03 (0.297)	-4.00 (6.765)	-0.02 (0.342)
Hispanic x Classroom behavior	0.18 (0.120)	-2.78 (2.607)	0.08 (0.126)
Hispanic x Extracurricular participation	-0.41 * (0.122)	-2.45 (2.635)	-0.13 (0.104)
Hispanic x Usefulness of school subjects	-0.02 (0.291)	3.90 (5.968)	0.16 (0.367)
Native American x Attendance	-0.03 (0.603)	-5.70 (10.504)	2.05 (1.341)
Native American x Classroom behavior	0.64 * (0.301)	0.11 (5.207)	0.59 (0.489)
Native American x Extracurricular participation	-0.14 (0.207)	-2.40 (6.084)	-0.07 (0.319)
Native American x Usefulness of school subjects	-1.07 (0.626)	-15.15 (21.301)	0.66 (1.144)
Asian x Attendance	0.82 (0.497)	-11.20 (9.209)	0.79 (0.500)
Asian x Classroom behavior	-0.20 (0.250)	6.83 (4.059)	0.20 (0.170)
Asian x Extracurricular participation	-0.16 (0.261)	-6.10 * (2.451)	-0.15 (0.134)
Asian x Usefulness of school subjects	1.73 * (0.687)	23.77 * (9.639)	0.34 (0.465)

† Not applicable.

* $p < .05$ ¹Response rate on this variable less than 85 percent.

NOTE: Table contains unstandardized regression coefficients. Standard errors in parentheses. Each coefficient is a contrast, group A-minus-group B (positive if group A has the higher value; negative if group B has the higher value). For effects with two or more contrasts, individual contrasts tested only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table 14. Strength-of-effect measures for engagement and postsecondary education outcomes: 2000

Predictor variable	Entering a postsecondary institution ¹	For those who entered postsecondary education	
		Number of credits earned ²	Completing a program of study ¹
Gender (M - F)	0.67 *	-0.08 σ	0.71 *
Race/ethnicity			
Black - White	1.42	-0.12 σ	0.75
Hispanic - White	2.63 *	-0.13 σ	0.73
Native American - White	0.50 *	-0.58 σ *	0.44
Asian - White	5.09 *	0.17 σ	0.73
School urbanicity - 8th grade			
Suburban - Urban	1.07	0.03 σ	1.00
Rural - Urban	0.83	0.12 σ	1.21
Type of postsecondary institution			
< 2-year - 2-year	†	-0.18 σ *	5.12 *
4-year - 2-year	†	0.89 σ *	1.72 *
Engagement			
Attendance	1.23 * ³	0.14 * ⁴	1.22 * ³
Classroom behavior	1.54 * ³	0.12 * ⁴	1.19 * ³
Extracurricular participation	1.39 * ³	0.05 ⁴	1.06 ³
Usefulness of school subjects	0.97 ³	0.02 ⁴	1.05 ³

† Not applicable.

* $p < .05$ ¹Odds ratio for specific predictor variable.²Response rate on this variable less than 85 percent.³Odds ratios associated with a one standard deviation increase in the specific engagement measure.⁴Standardized regression coefficient.

NOTE: Strength-of-effect measures estimated for main effects only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Students who entered less-than-2-year programs were more likely to complete a program of study than were students who entered 2-year programs (odds ratio = 5.12; table 14). Students who entered 4-year programs were also more likely to complete their studies than were students in 2-year programs (odds ratio = 1.72). The noncompletion rate for 2-year colleges was especially high: 61 percent of status risk students who entered 2-year colleges had not completed any program of study by the time of the fourth follow-up wave of NELS:88.¹⁰⁸

Behavioral Risk: Engagement/Disengagement in High School. As a set, the four school engagement measures were related to all postsecondary outcomes. Individually, attendance and

¹⁰⁸ Including other programs to which they may have transferred (percentage not shown in tables).

classroom behavior had positive relationships with postsecondary schooling. Both engagement measures were related to the odds of entering a postsecondary school (odds ratios = 1.23 and 1.54, respectively; table 14), to credits earned (standardized coefficients = 0.14 and 0.12, respectively), and to the odds of completing a program of study (odds ratios = 1.22 and 1.19, respectively). Disengagement, in terms of less frequent attendance and poorer classroom behavior, was associated with reduced postsecondary outcomes.

Extracurricular activities in high school were related to status risk students' entering a postsecondary school, with less participation being associated with reduced chances of entering a postsecondary program. Extracurricular activities were not related to persistence in postsecondary school, however, either in the form of accruing credits or completing a program of study.

In sum, among students at risk due to status characteristics, risk behaviors are related to postsecondary experiences, namely, being late or absent from classes, and nonparticipation in class work. The affective measure, the perceived utility of high school subjects, was not discernably related to any postsecondary education outcome.

Interactions. Tests of interactions reveal whether the relationships between engagement and postsecondary education vary between gender groups or among racial/ethnic groups. The interaction of gender with engagement (Gender x Engagement in table 13) was nonsignificant; the effects of high school engagement/disengagement on later educational outcomes were not measurably different for males and females.

The interaction of race/ethnicity by engagement was significant for entering a postsecondary institution and number of credits earned (table 13). For entering postsecondary education, two significant contrasts were found for participation in extracurricular activities. To explore further, the percentage entering postsecondary school was examined for each racial/ethnic group, with extracurricular activities classified into low (no activities), middle (1-2 activities), and high (3 or more activities). The relationship between entering postsecondary education and extracurricular activities varied by racial/ethnic group. A relationship was found for White students, for whom the percentage entering postsecondary school increased from 47 percent to 65 percent to 75 percent as the number of extracurricular activities increased.¹⁰⁹ No discernable differences were found for Hispanic or Black students, however. Thus, the relationship between extracurricular activities and entering postsecondary education, found for the entire status risk sample, was not supported for Black or Hispanic students.

A similar analysis was undertaken for the remaining four significant interactions of race/ethnicity with engagement (table 13). In each case, the engagement variable was classified into thirds and differences among the three groups were examined statistically. The only pattern to emerge was for White students: for Whites, one or both contrasts indicated a positive relationship between the usefulness of school subjects and entering postsecondary education, and between extracurricular participation and earning postsecondary credits. These were exceptions to the conclusion of no discernable relationships between these variables for the full sample.

¹⁰⁹ Values not tabled.

Question (2.2) Behavioral Risk and Employment: Is Engagement in High School Related to Later Employment and Income Among Status Risk Students?

The relationship of engagement with adult employment and income was examined in analyses that included student demographic characteristics and postsecondary educational attainments (if any). In these analyses, the four indicators of school engagement were the main independent variables, and three indexes of employment/income were the outcome measures: whether the respondent was employed for pay (full-time or part-time) in 2000, an index of consistent employment during 1997-1999, and, for those who were employed in 1999, their annual income.

The results are summarized in table 15; strength-of-effect measures are given in table 16. Each column of these tables gives results for one index of employment/income. The strength-of-effect measures for the yes/no dependent variable employed in 2000 are odds ratios. For the continuous dependent variables (consistent employment and income), the strength-of-effect measures are effect sizes if the independent variable is categorical (gender, race/ethnicity, urbanicity, postsecondary education) and standardized regression coefficients if the independent variable is continuous (engagement variables).

Background Variables.¹¹⁰ Gender differences were found on all three outcomes. Males at status risk were more likely than females to be employed in 2000, were more consistently employed over the period 1997–1999, and earned higher incomes than did females. Racial/ethnic differences were found only for annual income; Black young adults earned less, on average, than did Whites. All urbanicity differences were nonsignificant.

Postsecondary Education and Employment/Income. All three employment outcomes were related to postsecondary schooling. Status risk individuals who completed any postsecondary program (with a certificate or license, associate’s degree, or bachelor’s degree) had greater odds of being employed in 2000 than did those without postsecondary experience (odds ratios of 1.9, 7.5 and 2.2, respectively; table 16). In terms of consistent employment, associate’s degree holders and bachelor’s degree holders were more likely to be employed consistently over 3 years than those who had not completed any postsecondary program. In terms of income, individuals who had acquired an associate’s degree or bachelor’s degree¹¹¹ had higher incomes in 1999 than those who had not completed a postsecondary program. The median incomes for young adults who had been at status risk as high school students were \$22,000 with no postsecondary schooling, \$23,000 with an associate’s degree, and \$27,000 with a bachelor’s degree or higher (table 6).

¹¹⁰ The results for background variables differ slightly from those found in the attainment-group analysis (tables 9 and 10). Each set of results depends to some extent on the other variables in the model—attainment group differences or engagement measures.

¹¹¹ Or higher.

**Table 15. Regression results for engagement and employment/income outcomes:
1997-2000**

Predictor variable	Employed in 2000	Consistent employment ¹	1999 Annual income ^{2,3}
Gender (M - F)	1.20 * (0.188)	0.41 * (0.049)	0.39 * (0.065)
Race/ethnicity			
Black - White	0.33 (0.297)	-0.08 (0.089)	-0.35 * (0.123)
Hispanic - White	0.41 (0.216)	0.03 (0.068)	0.00 (0.058)
Native American - White	-0.61 (0.359)	-0.46 (0.199)	-0.25 (0.127)
Asian - White	0.30 (0.325)	-0.12 (0.111)	-0.14 (0.099)
School urbanicity - 8th grade			
Suburban - Urban	0.26 (0.239)	0.15 (0.080)	0.11 (0.091)
Rural - Urban	0.37 (0.230)	0.16 (0.078)	0.03 (0.083)
Postsecondary education completed			
Some PSE, no degree - None	0.24 (0.206)	0.12 (0.067)	-0.01 (0.086)
Certificate/license - None	0.66 * (0.310)	0.09 (0.125)	-0.01 (0.138)
Associate's degree - None	2.02 * (0.432)	0.25 * (0.069)	0.16 * (0.075)
Bachelor's degree or higher - None	0.79 * (0.231)	0.15 * (0.077)	0.34 * (0.083)
Engagement			
Attendance	0.05 (0.167)	0.11 * (0.049)	0.10 (0.068)
Classroom behavior	0.18 * (0.085)	0.02 (0.021)	-0.01 (0.016)
Extracurricular participation	-0.04 (0.045)	-0.02 (0.014)	0.00 (0.014)
Usefulness of school subjects	-0.36 * (0.138)	-0.12 * (0.044)	0.05 (0.055)
Gender x Engagement			
Gender x Attendance	-0.35 (0.317)	-0.09 (0.088)	-0.08 (0.142)
Gender x Classroom behavior	0.17 (0.132)	-0.00 (0.035)	-0.01 (0.036)
Gender x Extracurricular Participation	-0.02 (0.093)	-0.05 (0.029)	0.01 (0.028)
Gender x Usefulness of school subjects	0.06 (0.313)	0.09 (0.087)	0.03 (0.102)

See notes at end of table.

**Table 15. Regression results for engagement and employment/income outcomes:
1997-2000—Continued**

Predictor variable	Employed in 2000	Consistent employment¹	1999 Annual income^{2,3}
Race/ethnicity x Engagement			
Black x Attendance	-0.80 * (0.376)	-0.05 (0.142)	0.37 (0.275)
Black x Classroom behavior	0.76 * (0.199)	0.13 (0.067)	0.00 (0.065)
Black x Extracurricular participation	0.03 (0.133)	-0.07 (0.036)	0.02 (0.050)
Black x Usefulness of school subjects	-0.87 * (0.414)	0 (0.124)	0.28 (0.212)
Hispanic x Attendance	-0.27 (0.381)	-0.06 (0.088)	-0.146 (0.092)
Hispanic x Classroom behavior	0.26 (0.139)	0.03 (0.036)	0.02 (0.032)
Hispanic x Extracurricular participation	-0.04 (0.106)	0.00 (0.034)	0.00 (0.030)
Hispanic x Usefulness of school subjects	0.08 (0.324)	-0.09 (0.100)	0.03 (0.077)
Native American x Attendance	1.78 * (0.884)	0.43 (0.499)	-0.33 (0.169)
Native American x Classroom behavior	0.12 (0.277)	0.03 (0.117)	0.04 (0.101)
Native American x Extracurricular participation	0.46 * (0.200)	0.04 (0.077)	-0.15 (0.126)
Native American x Usefulness of school subjects	-1.22 (0.756)	-0.37 (0.280)	-0.00 (0.208)
Asian x Attendance	-0.40 (0.484)	-0.07 (0.159)	-0.12 (0.185)
Asian x Classroom behavior	-0.41 (0.432)	-0.01 (0.080)	0.06 (0.076)
Asian x Extracurricular participation	0.04 (0.165)	0.10 (0.055)	0.01 (0.045)
Asian x Usefulness of school subjects	-0.65 (0.830)	0.15 (0.157)	0.18 (0.195)

See notes at end of table.

**Table 15. Regression results for engagement and employment/income outcomes:
1997-2000—Continued**

Predictor variable	Employed in 2000	Consistent employment ¹	1999 Annual income ^{2,3}
Postsecondary Education Completed x Engagement			
Some PSE, no degree x Attendance	-0.29 (0.340)	-0.04 (0.099)	-0.11 (0.195)
Some PSE, no degree x Classroom behavior	-0.10 (0.131)	0.05 (0.041)	0.12 (0.044)
Some PSE, no degree x Extracurricular participation	0.07 (0.111)	0.02 (0.040)	0.04 (0.035)
Some PSE, no degree x Usefulness of school subjects	0.78 (0.361)	0.26 * (0.124)	0.11 (0.161)
Certificate/license x Attendance	-0.57 (0.591)	0.15 (0.190)	-0.23 (0.274)
Certificate/license x Classroom behavior	-0.14 (0.193)	-0.05 (0.054)	0.12 (0.058)
Certificate/license x Extracurricular participation	0.22 (0.144)	0.03 (0.055)	-0.03 (0.055)
Certificate/license x Usefulness of school subjects	0.62 (0.381)	0.15 (0.121)	-0.15 (0.112)
Associate's degree x Attendance	0.32 (0.852)	-0.04 (0.140)	0.16 (0.206)
Associate's degree x Classroom behavior	-0.12 (0.303)	0.07 (0.051)	0.08 (0.051)
Associate's degree x Extracurricular participation	0.45 (0.282)	-0.00 (0.045)	-0.01 (0.041)
Associate's degree x Usefulness of school subjects	1.89 (0.777)	0.14 (0.123)	0.02 (0.123)
Bachelor's degree or higher x Attendance	-0.38 (0.489)	-0.29 * (0.125)	-0.26 (0.170)
Bachelor's degree or higher x Classroom behavior	-0.01 (0.199)	0.13 * (0.056)	0.10 (0.055)
Bachelor's degree or higher x Extracurricular participation	-0.05 (0.133)	-0.01 (0.042)	0.01 (0.034)
Bachelor's degree or higher x Usefulness of school subjects	0.36 (0.396)	0.12 (0.116)	0.04 (0.085)

* $p < .05$ ¹0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.²Of those employed in 1999; annual income data were only available for 1999.³Log 1999 income in dollars.

NOTE: Table contains unstandardized regression coefficients. Standard errors in parentheses. Each coefficient is a contrast, group A-minus-group B (positive if group A has the higher value; negative if group B has the higher value). For effects with two or more contrasts, individual contrasts tested only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table 16. Strength-of-effect measures for engagement and employment/income outcomes: 2000

Predictor variable	Employed in 2000 ¹	Consistent employment ²	1999 Annual income ^{3,4}
Gender (M - F)	3.32 *	0.51 σ *	0.53 σ *
Race/ethnicity			
Black - White	1.38	-0.10 σ	-0.47 σ *
Hispanic - White	1.50	0.04 σ	0.00 σ
Native American - White	0.55	-0.56 σ	-0.33 σ
Asian - White	1.35	-0.15 σ	-0.19 σ
School urbanicity - 8th grade			
Suburban - Urban	1.29	0.19 σ	0.15 σ
Rural - Urban	1.45	0.20 σ	0.03 σ
Postsecondary education completed			
Some PSE, no degree - None	1.28	0.15 σ	-0.01 σ
Certificate/License - None	1.94 *	0.11 σ	-0.01 σ
Associate's degree - None	7.54 *	0.31 σ *	0.21 σ *
Bachelor's degree or higher - None	2.21 *	0.19 σ *	0.46 σ *
Engagement			
Attendance	1.03 ⁵	0.08 ^{*6}	0.07 ⁶
Classroom behavior	1.31 ^{*5}	0.04 ⁶	-0.02 ⁶
Extracurricular participation	0.94 ⁵	-0.03 ⁶	0.00 ⁶
Usefulness of school subjects	0.80 ^{*5}	-0.08 ^{*6}	0.04 ⁶

* $p < .05$ ¹Odds ratio for specific predictor variable.²0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.³Of those employed in 1999; annual income data were only available for 1999.⁴Log 1999 income in dollars.⁵Odds ratios associated with a one standard deviation increase in the specific engagement measure.⁶Standardized regression coefficient.

NOTE: Strength-of-effect measures estimated for main effects only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Behavioral Risk: Engagement/Disengagement in High School. The links between school engagement/disengagement and employment and income are the most tentative of those examined in this analysis. The elapsed time between high school and employment 8 years later is substantial, and the theory connecting employment with high school engagement is more speculative than that connecting employment with school attainments.

As a set, the four engagement measures were related to current employment in 2000 and to consistent employment. Classroom behavior was positively related to current employment (table 15). The attendance composite was positively but weakly related to consistent employment. Better attendance and coming to class on time were associated with more consistent employment as a young adult, and poorer attendance with less consistent employment, but the standardized regression coefficient was small (0.08; table 16). In the correlation analysis, which did not include student background variables, attendance was also weakly related to current employment (table 12).¹¹² Extracurricular participation was not measurably related to any employment outcome.

The perceived usefulness of school subjects (UTILITY) was related to current employment and consistent employment, but in the opposite direction than was hypothesized. Follow-up analyses were conducted omitting the UTILITY variable. These yielded nonsignificant overall tests of engagement with current employment and income. For consistent employment, no individual engagement measure was significant. With this reduced set of engagement measures, and with student demographics and postsecondary education included in the regressions, high school engagement was not discernably related to employment or income.

In the analysis of high school attainments and employment/income (question 1.2), a set of follow-up analyses were run excluding postsecondary education.¹¹³ It was found that the relationship of attainment with employment was mediated by postsecondary schooling.¹¹⁴ Likewise, follow-up analyses were conducted for question 2.2 to see if postsecondary education mediated the relationship between engagement and employment. If so, additional statistically significant relationships would emerge when postsecondary education was omitted from the analysis. In this follow-up analysis, engagement was still related to employment in 2000 and to consistent employment, and not related to income. In terms of specific engagement variables, attendance was still related to consistent employment, and classroom behavior was still related to current employment. UTILITY was inversely related to both outcomes.

In sum, among student at risk due to status characteristics, specific risk behaviors are weakly related to employment in the years following high school. Poor classroom behavior is associated with a reduced likelihood of being employed, and poor attendance with less consistent employment over three years. When behavioral risk is measured by three of the four engagement variables, these relationships become more tentative still.

¹¹² In multiple regression, correlations among the independent variables (“collinearity”) can sometimes mask their association with the dependent variables. In these particular analyses, collinearity among the engagement measures may have masked some of the association with current employment or consistent employment.

¹¹³ See “Question (1.2)” in chapter 3 of this report.

¹¹⁴ That is, the relationships of attainment and employment became nonsignificant when postsecondary schooling was included in the regressions.

Interactions. The interaction of gender with engagement was nonsignificant for every employment measure (table 15); that is, the relationships of engagement with employment did not vary discernably by gender. The overall test of the race/ethnicity-by-engagement interaction was significant for current employment. Specifically, the interactions of the Black–White difference with attendance, classroom behavior, and usefulness of school subjects were significant, as well as the Native American/Alaska Native–White difference with attendance and extracurricular participation. To investigate, respondents were classified into three equal-sized groups on each engagement measure and the percentage of employed respondents at each level was computed within racial/ethnic groups.

Two patterns emerged. First, the percentages of White participants with low, middle, and high classroom behavior who were currently employed were 86 percent, 85 percent, and 85 percent, respectively.¹¹⁵ Among Black participants, the percentages increased from 76 percent to 90 percent to 94 percent employed as classroom behavior improved from low to high. Poor classroom behavior was related to lower employment rates among Black students but not among Whites. Second, the interactions for Native American/Alaska Native students were attributable to low employment rates for Native American/Alaska Natives who were low on attendance (45 percent employed) and low on extracurricular participation (30 percent employed) compared to Native American/Alaska Native students who were mid-level on each measure (97 percent and 87 percent, respectively).¹¹⁶ No such differences were found for White students.

The overall test of the postsecondary education-by-engagement interaction was significant for consistent employment. The data were partitioned into low, middle, and high engagement groups. One result to emerge may account in part for the weak relationship between attendance and consistent employment (table 16). Among participants with a bachelor’s degree, no discernable differences in consistent employment were found among those who were low, middle, and high on the attendance composite. In the comparison group (those with no postsecondary education), as in the total sample,¹¹⁷ the consistent employment index was lower among low attendance students than among high attendance students.

Question (2.3) Behavioral and Academic Risk: Is Engagement Related to Young Adult Outcomes, Above and Beyond High School Attainment?

This portion of the analysis reexamined the relationship between behavioral risk (engagement/disengagement) and young adult outcomes with academic risk (attainment groups) also included in the regressions. Other portions of the analysis demonstrated a relationship between high school engagement and postsecondary education, and a weak relationship between high school engagement and later employment, without considering the effects of attainment.¹¹⁸ This analysis asks if the relationship of engagement with adult outcomes is explained by the fact that engagement is related to attainment which, in turn, is related to postsecondary schooling and employment. The alternative is that engagement is related to adult outcomes or some other unspecified mechanism.

¹¹⁵ Percentages not given in tables.

¹¹⁶ These percentages are based on sample sizes below 30 and may be unreliable.

¹¹⁷ That is, the test of attendance with consistent employment in the Engagement section of table 15.

¹¹⁸ Question (2.1) and question (2.2), respectively, in this chapter.

The regressions for engagement (tables 13 and 15) were re-run with both attainment and engagement as predictor variables. All other predictor variables were also included, that is, gender, race/ethnicity, school urbanicity, the type of postsecondary institution attended (for credits earned and postsecondary program completion), and postsecondary education completion (for employment and income). Strength-of-effect measures for postsecondary education outcomes are given in table 17, and for employment and income are given in table 18. The complete regression results for all predictor variables are given in tables C-5 and C-6 in appendix C.

Table 17. Strength-of-effect measures for postsecondary education outcomes, by engagement factors and attainment groups: 2000

Predictor variable	Entering a postsecondary institution ¹	For those who entered postsecondary education	
		Number of credits earned ²	Completing a program of study ¹
Engagement			
Attendance	1.06	0.13 * ³	1.17
Classroom behavior	1.29 *	0.08 * ³	1.13
Extracurricular participation	1.26 *	0.03 ³	1.05
Usefulness of school subjects	0.97	0.01 ³	1.05
Attainment group			
(A1) Successful completers - Marginal completers	2.70 *	0.40 σ *	1.31 *
(A2) Noncompleters - Marginal completers	0.30 *	-0.34 σ *	0.52 *

* $p < .05$

¹Odds ratio for specific predictor variable.

²Response rate on this variable less than 85 percent.

³Standardized regression coefficient.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Engagement/Disengagement and Young Adult Outcomes. The main purpose of this analysis was to determine if the effects of engagement (behavioral risk) on postsecondary outcomes are significant independently of high school attainments (academic risk). The answer is “yes” with respect to postsecondary education. Engagement was related to entering a postsecondary program, number of credits earned, and completing a program of study,¹¹⁹ above and beyond the effects of high school attainment (table 17). In all, engagement is related to high school attainments—grades, test scores, and graduation; and engagement is related to long-term educational outcomes in ways not explained by high school accomplishments alone.

¹¹⁹The overall test of four engagement variables was significant for completing a program of study, but no test of the individual variables was significant.

Table 18. Strength-of-effect measures for employment/income outcomes, by engagement factors and attainment groups: 2000

Predictor variable	Employed in 2000 ¹	Consistent employment ²	1999 Annual income ^{3,4}
Engagement			
Attendance	0.98	0.05 ⁵	0.05 ⁵
Classroom behavior	1.27	0.01 ⁵	-0.04 ⁵
Extracurricular participation	0.93	-0.04 ⁵	-0.01 ⁵
Usefulness of school subjects	0.81	-0.08 ^{*5}	0.04 ⁵
Attainment group			
(A1) Successful completers - Marginal completers	1.05	0.14 σ ^{*6}	0.07 σ ⁶
(A2) Noncompleters - Marginal completers	0.64	-0.30 σ ^{*6}	-0.29 σ ⁶

* $p < .05$ ¹Odds ratio for specific predictor variable.²0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.³Of those employed in 1999; annual income data were only available for 1999.⁴Log 1999 income in dollars.⁵Standardized regression coefficient.⁶Effect sizes; mean differences in standard deviation units.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Several individual measures that were significant in the first analysis of engagement were reduced to nonsignificance when attainment groups were included in the regressions.¹²⁰ Despite this, attendance and extracurricular participation remained positively related to the entering a postsecondary program, and attendance and classroom behavior remained related to the number of credits earned (table 17). Higher levels of engagement were associated with better postsecondary outcomes, and disengagement was associated with reduced outcome.

In contrast, engagement was not discernably related to current employment or income at age 26 when high school attainment was included in the regression (table 18). Only the relationship of the perceived usefulness of school subjects with consistent employment was significant, but this was in the direction opposite of that hypothesized.¹²¹

In sum, among student at risk due to status characteristics, behavioral risk (engagement/disengagement in high school) is related to high school attainments¹²² and to postsecondary schooling. Disengagement is associated with poorer outcomes in high school and

¹²⁰ The relationships of attendance with entering a postsecondary education and the relationship of attendance and classroom behavior with completing a program of study.¹²¹ A follow-up analysis with the usefulness variable deleted produced a nonsignificant overall test of engagement with consistent employment.¹²² See “Engagement/Disengagement and Attainment Groups” in this chapter.

with a reduced likelihood of entering or persevering in post-high school study. The relationship of behavioral risk with postsecondary education is not fully explained by academic risk factors (high school grades and graduation).

5. Summary of Results

The purpose of this analysis was to examine diversity in outcomes among students at risk for school failure because of traditional status characteristics. A sample of students was selected from the NELS:88 survey who were followed from eighth grade until they were 8 years beyond high school age. All members of the sample were at status risk because they came from a low-SES home (parents of limited educational attainments and/or limited incomes and/or jobs of limited status), and because they attended low-SES schools (schools serving high proportions of low-income students).

The analyses focused on two additional sets of risk factors. Behavioral risk factors are behaviors which, in their positive forms (engagement), may be related to enhanced school performance even among students at status risk. Previous research suggests that engagement behaviors serve a “protective” function, to lessen the negative impact of status risk factors such as economic disadvantage. In their negative forms (disengagement) these behaviors can further impede learning. Engagement/disengagement behaviors examined in this analysis were patterns of attendance and timeliness, participation in learning activities in the classroom, participation in extracurricular activities, and attitudes about the utility of school subjects.

Academic risk factors are less-than-successful outcomes at one point in a school career that can interfere with the chances of success at later stages. In this analysis, grades, test scores, and graduation status were viewed as high school outcomes that can be risk factors with respect to further schooling and employment. Based on these criteria, the sample was classified into one of three attainment groups: successful completers, marginal completers, or noncompleters. Modest definitions of success were used on the assumption that maintaining a reasonable grade point average and graduating from high school are noteworthy accomplishments for students who face the obstacles that accompany status risk.

The analyses focused on the relationships among behavioral risk, academic risk, and postsecondary schooling and employment for the sample of status risk students. Five questions were addressed regarding risk and post-high school outcomes.

- Question (1.1) Academic risk and postsecondary education: Are attainments in high school related to postsecondary education among status risk students?
- Question (1.2) Academic risk and employment: Are attainments in high school related to later employment and income among status risk students?
- Question (2.1) Behavioral risk and postsecondary education: Is engagement in high school related to postsecondary education among status risk students?
- Question (2.2) Behavioral risk and employment: Is engagement in high school related to later employment and income among status risk students?

- Question (2.3) Behavioral and academic risk: If engagement is related to young adult outcomes (education and employment), is the connection attributable to high school attainments?

The results of the multivariate regression analyses are summarized in Table 19, in which the asterisks (*) indicate statistically significant relationships between variables.

Table 19. Summary of regression analyses of school attainment and of school engagement on postsecondary education and employment/income: 2000

Predictor variable	Postsecondary education			Employment/income		
	Entered institution	Credits earned ¹	Completed program	Employed in 2000	Consistent employment ²	1999 income ^{3,4}
Attainment groups ⁵	*	*	*		*	
Successful - Marginal	*	*	*			
Noncompleter - Marginal	*	*	*		*	
Engagement ⁶	*	*	*	*	*	
Attendance	*	*	*		*	
Classroom behavior	*	*	*	*		
Extracurricular	*					
Usefulness of subjects						

* $p < .05$

¹Response rate on this variable less than 85 percent.

²0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.

³Of those employed in 1999; annual income data were only available for 1999.

⁴Log 1999 income in dollars.

⁵Test of all contrasts among three groups (Wald test).

⁶Overall test of set of four engagement measures (Wald test).

NOTE: Summary of separate analyses of attainment and engagement.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Academic Risk and Young Adult Outcomes

Even though all students in the analysis were at risk by virtue of poor socioeconomic conditions, there was considerable variability in high school and post-high school outcomes. Despite their risk status, a sizeable percentage of students in the sample maintained passing grades, graduated from high school,¹²³ and went on to further accomplishments in school and the work place.

¹²³ Termed successful completers and marginal completers in this analysis.

High school to post-high school connections (questions 1.1 and 1.2), were examined in a series of regression analyses that also included demographic characteristics; these are summarized in the top portion of table 19.

The analyses found relationships between academic risk, in the form of high school attainments, and all aspects of postsecondary education: entering a postsecondary program, accruing postsecondary credits, and completing a program of study. High school achievement, even at modest levels, was associated with increased postsecondary schooling, and graduating from high school was associated with continued educational attainments of status risk students. Dropping out of high school was associated with reduced chances of entering or persisting in postsecondary education.

The analyses also found an association between high school attainments and one measure of employment by age 26: consistent employment over a 3-year period. High school noncompleters had less consistent employment records than either of the other groups. Current employment and income were related to high school attainments but the relationships were explained by differences in postsecondary education.

Behavioral Risk and Young Adult Outcomes

Consistent with previous research,¹²⁴ behavioral risk was related to high school attainments. All engagement measures except perceptions of utility discriminated among the attainment groups. Measures of attendance and classroom behavior had strong relationships with attainment, with high school noncompleters being the least engaged of the three groups (tables 11 and C-4).

The relationships of engagement/disengagement with young adult outcomes (questions 2.1, 2.2, and 2.3) were examined in a series of regression analyses that also included student demographics and postsecondary education; these are summarized in the bottom portion of table 19.

Engagement was related to all postsecondary education outcomes: entering postsecondary schooling, accruing credits, and completing a program of study. In terms of specific measures, attendance and classroom behavior were positively related to all three outcomes, and extracurricular participation in high school was related to the likelihood of entering a postsecondary program. In each instance, disengagement was related to reduced postsecondary outcomes. The relationship of engagement with postsecondary education remained statistically significant when attainment groups were included in the regression analysis, although several relationships with specific variables became nonsignificant. In this follow-up analysis, attendance was still related to credits earned, classroom behavior was related to the likelihood of entering a postsecondary program and to credits earned, and extracurricular participation was related to the likelihood of entering a program.

School engagement was related to two employment outcomes, current employment in 2000 and consistent employment, but not to income. The relationships were weak and limited in

¹²⁴ See “The Connection with Academic Risk Factors” in chapter 1.

scope, however. Only one engagement measure was related to each employment measure: classroom behavior to current employment, and attendance to consistent employment. Further, these relationships described some groups of participants but not others.¹²⁵ A third engagement measure (extracurricular activities) was not discernably related to employment, and a fourth measure (perceived usefulness of school subjects) was related inversely to employment. No discernable relationships between engagement and employment were found when high school attainments were also included in the regressions.

In sum, behavioral risk in high school is related to postsecondary schooling among status risk students. Those who are more engaged in high school are more likely to undertake further education and to persist and complete a program of study. Those who are least engaged are least likely to enter postsecondary programs—even short-term career preparation programs or 2-year colleges. At the same time, there is little if any direct relationship between behavioral risk and employment or income by age 26 for individuals at risk due to status characteristics.

¹²⁵ The analysis of interactions showed that the behavior-to-current employment relationship did not hold for White students, and the attendance-to-consistent employment connections did not hold for participants with BA degrees.

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Appendixes

Appendix A. Technical Notes

Appendix B. Standard Errors Tables

Appendix C. Other Statistical Tables

Appendix D. Variables Used in This Report

Appendix A. Technical Notes

Overview of the NELS:88 Survey

The NELS:88 survey was begun in 1988 by the National Center for Education Statistics (NCES) with a nationally representative sample of eighth-grade students. Participants were followed longitudinally through the year 2000, when most were 26 years of age. Data were collected on the students and their parents, teachers, and schools as they progressed through high school and beyond.

NELS:88 focused on issues of education policy including the “identification of school attributes associated with achievement; the transition of different types of students from eighth grade to secondary school and to postsecondary institutions; the transition of secondary and postsecondary students to the workforce; the influence of ability grouping and program type on future educational experiences and achievements; ... and changes in educational practices over time” (Curtin et al. 2002, p. 10).

To accomplish these purposes, data were collected in five waves: when students were in eighth grade, tenth grade, twelfth grade, 2 years beyond high school age, and 8 years beyond high school age. In eighth, tenth, and twelfth grades, students completed extensive questionnaires and tests of academic achievement. Further, teachers and school administrators completed questionnaires in each wave; teachers provided general information about themselves and their classes as well as ratings of each student in the survey. When the students were in eighth and twelfth grades, their parents also completed questionnaires providing information about themselves, their home setting, and their children. Post-high school information was collected through computer-assisted telephone interviews.

Additionally, two rounds of transcript data were collected on the students. High school transcripts were collected for all participants in the school-age sample, including dropouts and early graduates. These made it possible to validate information in the questionnaires (e.g., grades, attendance) and to investigate other policy issues, for example, course taking patterns and their relationships to other attainments. Postsecondary transcripts were collected for students who reported attending a school beyond high school. The data included student information (e.g., courses taken; the number of credits earned; degree completion) and institutional characteristics (e.g., type of institution; location of the school).

Students who dropped out of school after eighth grade continued to be followed at subsequent time points. A dropout questionnaire was administered in 1990 and 1992, and dropouts were contacted for further information through the telephone interviews in 1994 and 2000.

Detailed information about the data collected in NELS:88 is given in *Base-Year to Fourth Follow-up Data File User’s Manual* (Curtin et al. 2002). The data are available to the public for research purposes in public and restricted use versions. To increase their accessibility,

NCES has developed an “Electronic Codebook” for each data file that allows users to scan the data variable by variable, view the original questions that were posed in the questionnaires, obtain frequency distributions for responses to any question, and create a working file with specific variables in SPSS or SAS format.

Sampling Design, Weighting, Standard Errors, and Statistical Procedures

Sampling Design

In the NELS:88 base year (1988), a two-stage stratified cluster sampling design was used to select a nationally representative sample of eighth grade schools and students (see Spencer et al. 1990). At the first stage, 1,655 public and private schools were contacted from a national pool of about 39,000 public and private schools that enrolled eighth grade students in the United States. The probability of selection was proportional to the number of eighth graders in the school. Private schools were oversampled so that the sample would include enough private schools for subset analyses. Of those selected, 1,057 (817 public and 240 private) schools agreed to participate, of which 1,052 (815 public and 237 private) schools ultimately provided eighth-grade student data.¹ At the second stage, an average of 25 eighth-grade students was selected from each school. Asian and Hispanic students were oversampled. In all, a national sample of approximately 26,000 students was identified of which 24,599 actually participated in the survey.²

The survey followed the progress of each student during the remaining years of high school, with data collection points at the end of grade 10 (first follow-up, 1990) and grade 12 (second follow-up, 1992). Students who left high school without graduating were contacted and administered survey instruments, as well as those who remained in school. The tenth and twelfth grade samples were “freshened” with new students at the same grade levels so that the sample at each grade level was representative of the population of students in that year. In addition to the freshened students, students who were found to be ineligible during the base year (due to, for example, limited English proficiency or a disability that prevented them from completing assessments), but who were later determined to be eligible in tenth or twelfth grade, were added to the sample.

Further data collection points occurred in 1994, when most participants were 2 years past high school (third follow-up), and in 2000 when most were 8 years past high school and about 26 years old (fourth follow-up). For cost reasons, participants were subsampled in both post-high school waves of data collection. The final five-wave sample included 12,144 respondents. Details of sample design, including the sampling frame, size of clusters, use of stratification, and

¹ Table 2.8-2 of the *Base Year Sample Design Report* (Spencer et al. 1990) gives a 69.7 percent school participation rate based on a subset of the 1655 schools contacted.

² The response rate for students was 93.1 percent unweighted, and 93.4 percent weighted (Spencer et al. 1990, table 2.8-1).

other technical issues are discussed in depth in *Base-Year to Fourth Follow-up Data File User's Manual* (Curtin et al. 2002).

Weighting

The general purpose of weighting is to adjust for the probabilities of unequal selection of schools and students, and to compensate for the effects of non-response by schools and students selected to participate.

The 24,599 eighth-grade participants in the base year represented the approximately 3,000,000 students who attended eighth grade in the U.S. in 1988. Each student represented about 120 students ($3,000,000/25,000 = 120$). Oversampling of Asians, Hispanics, and private school students means that they were over-represented in the data file and required smaller weighting (i.e. they each represented fewer than 120 students.)

To adjust for nonresponse, weights of nonrespondents were distributed among the respondents who had similar characteristics. The *NELS:88 Base Year to Fourth Follow-up Data File User's Manual* (Curtin et al. 2002) provides response rates for each wave of the NELS:88 data collection, both overall and by selected subgroups (e.g., gender, race/ethnicity, and high school enrollment).

In data analysis, true population estimates can only be obtained by using the appropriate weights. The estimates in this report were produced using F4PNLWT, a panel weight that generalizes to the population of spring 1988 eighth graders, and applies to survey sample members who completed questionnaires in all five waves of NELS:88.

Standard Errors

The NELS:88 data collection involved stratification, the disproportionate sampling of certain strata, and clustered (i.e., multistage) probability sampling. This results in statistics that are more variable than they would have been if a simple random sample of the same size had been drawn.

The calculation of standard errors must take these complexities into account. Standard errors obtained without these considerations will be artificially small³ and will tend to exaggerate significance levels. Indeed, some popular statistical analysis packages calculate standard errors without accounting for the sampling complexities associated with surveys like NELS:88. This can result in statistical tests erroneously being reported as significant.

The calculation of exact standard errors for survey estimates can be difficult. Several approaches to estimating population variances for complex surveys are available, among them the "Taylor series" approach (Binder 1983; Lee, Forthofer, and Lorimor 1989) incorporated in statistical packages such as SUDAAN (Research Triangle Institute 2001) and AM (Cohen et al. 2003).

³ And confidence intervals will be artificially narrow.

The AM program was used for all tests of significance in this analysis. It accepts sampling weights and performs multiple regression analysis and logistic regression, producing correct standard errors for all effects; AM accepts identifiers for the sampling stratum and the primary sampling unit (school) as input, in addition to the data.

Statistical Procedures

This analysis used two types of statistical procedures, tests of differences between means or proportions, and tests of linear relationships between numerical variables. When two or more independent variables were involved in analysis, computations were performed by the AM software (Cohen et al 2003). Multiple regression analysis and logistic multiple regression analysis were used to determine the relationship between the independent variables (predictors) and the main outcomes of the analysis: postsecondary education and employment/income.

Tests to confirm descriptive results, and follow-up tests (for example, simple main effect tests when interactions were significant in the regressions), used the t statistic:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where E_1 and E_2 are the estimates to be compared (means or proportions), and se_1 and se_2 are the corresponding standard errors, obtained from AM.

Throughout the report, a type-1 error rate of $\alpha = .05$ was used. In addition, in all tests of significance of two or more contrasts (or two or more independent variables), specific effects were only examined when the overall or “omnibus” test was significant at the .05 level.

Tests of significance reveal whether a relationship between variables is statistically reliable, but tell little about the strength of the relationship. Thus, strength-of-effect measures were obtained to accompany all statistical tests.

Particular strength-of-effect measures were chosen depending on the nature of the measurement scales involved. When the dependent variable was dichotomous (e.g., entering postsecondary education), odds ratios were computed. If the independent variable was also categorical (e.g., groups A and B), the ratio was the odds that a member of group A would enter postsecondary schooling divided by the odds that a member of group B would enter. When the independent variable was numerical (e.g., engagement variable x), the ratio was the change in odds associated with a one-standard deviation change in x .

When the dependent variable was numeric and the independent variable was categorical, effect sizes were computed. This is the estimated difference between the mean of population A and mean of population B divided by the standard deviation of the dependent variable.⁴ The effect size is interpreted as the number of standard deviations separating the means of the two groups. When the dependent variable was numeric and the independent variable was also

⁴ The standard deviation was estimated by the square root of the residual mean square from the regression analysis.

numeric, standardized regression coefficients were computed, that is, the number of standard deviations change in the dependent variable associated with a one-standard-deviation increment in x .

Response Rates for Variables Used in This Analysis

Table A-1 reports the weighted response rates for variables used in this analysis, either in the descriptive portion or the regression analyses. The rates represent the final percentage of cases having the measure after all composite and derived variables were created. The effect of item nonresponse was reduced by deriving measures from multiple sources. When the same measure was available from multiple variables within a wave, all sources of information were used to reduce missing data. For example, to determine the type of postsecondary institution a student attended, two variables from the postsecondary education transcript data and one variable from the fourth follow-up student questionnaire were used. Similarly, when the same measure was available from several waves, and a student did not have the measure in the primary wave chosen, an alternate wave was used. For example, if measures used for the engagement variables ABSTARDY, CLASSBEH, and EXTRA were not available for a student in tenth grade, twelfth-grade responses were used if they were available.

Appendix D gives detailed information about the variables used in this analysis, including constructed variables.

Data Limitations

The National Center for Education Statistics made every effort to collect complete responses, to clean the NELS:88 data, and to ensure consistency within and between responses. This work is described in detail in the *NELS:88 Base Year to Fourth Follow-up Data File User's Manual* (Curtin et al. 2002). Nevertheless, some data limitations arise in any large survey, particularly one that draws data from many sources in several stages. Several of these may have affected the data used in this analysis.

First, in the base year data collection, approximately 5 percent of the students were unable to participate in the survey due to limited English proficiency or to a physical or mental disability (Ingels 1996). Although some of these students were included in later waves of NELS:88, they were excluded from this analysis, which only included participants who participated in all five waves of data collection.

Second, the collection of similar measures at different time points and from several sources resulted in occasional conflict among the values. Specifically, measures of students' high school graduation status were collected in NELS:88 in the second, third, and fourth follow-ups, and also from the high school transcripts. All school reports of students dropping out were confirmed by contacting the student directly, but the school and student report of dropping out were not in agreement in approximately five percent of the cases. The student report was used in NELS:88 to create the composite variable F4UNI2D, used in the present analysis.

Third, missing data due to questionnaire nonresponse may have affected the results. Father's education was reported by 79 percent of eighth-grade students, and mother's education was reported by 87 percent of students. These variables were used for descriptive purposes only (table 3). Three variables more central to the analyses had response rates close to 85 percent.

Some students were not rated by their teachers either in grade 10 or in grade 12, and measures of classroom behavior could not be constructed; the response rates for variables ABSTARDY and CLASSBEH were 87 percent and 86 percent respectively. The number of credits earned in a postsecondary program of study was available for 85 percent of the participants who attended a postsecondary school; transcripts were unavailable for the remaining students. All other variables used in the analyses had response rates of 90 percent or above.⁵

These response rates are comparable to those in other national surveys.⁶ Nevertheless, cases with missing values were excluded from all analyses involving the particular variable(s), and some of the relationships given in this report may contain some bias for that reason.

⁵ The response rate for the tenth-grade achievement composite, F12XCOMP, was 89.5 percent, but this variable was used together with others to decide students' attainment classifications. It did not cause any cases to be eliminated.

⁶ See Ingels et al. (2004) for nonresponse rates in the Education Longitudinal Study of 2002.

Table A–1. Response rates of variables used in descriptive or regression analyses

Variable name	Source variable name	Description	Weighted response rate
ABSTARDY	Derived	How often student is absent or tardy	86.7
BY2XCOMP	BY2XCOMP	Standardized test composite - reading and math, grade 8	95.9
BYSES	BYSES	Socioeconomic status	100.0
CHILDREN	F4GNCH	Number of biological children	99.5
CLASSBEH	Derived	Teacher rating of student's classroom behavior	86.5
CNSTEMPL	Derived	Constancy of employment across three years, 1997-1999	93.1
COMPPSE	Derived	Completed postsecondary education; recoded from HIGHDEGR	98.9 ¹
EMPLOYED	F4AEMPL	Employed for pay at fourth follow-up	100.0
ENTERPSE	Derived	Entered postsecondary education; recoded from FRSTINST	97.1
EXTRACUR	Derived	Participation in extracurricular activities	98.7
F12XCOMP	F12XCOMP	Standardized test composite - reading and math, grade10	89.5
FREELNCH	Derived ²	Percent of students in school who receive free lunch	100.0
F4BWKSWK	F4BWKSWK	Number of weeks worked in 1999	95.3
F4RACE	F4RACE	Race of respondent	100.0
F4SEX	F4SEX	Gender of respondent	100.0
F4UNI2D	F4UNI2D	Second follow-up status of sample member	100.0
FAMCOMP	BYFCOMP	Family composition composite	98.6
FAMILYINC	BYFAMINC	Base year parent report of total family income from all sources	90.7
FATHERED	BYS34A	Student report of father's highest level of education attained	78.8 ³
FRSTINST	Derived	Type of first institution entered	97.1
FULLTIME	F4AACTF	Fourth follow-up employment is full-time	100.0
G10TYPE	G10CTRL1	School classification reported by school, grade 10	97.4
G8LUNCH	G8LUNCH	Percent of students in grade 8 school who receive free lunch	98.0
G8TYPE	G8CTRL	School classification reported by school, grade 8	100.0
G8URBAN	G8URBAN	Urbanicity of school, grade 8	100.0
HIGHDEGR	Derived	Highest postsecondary degree attained; recoded F4HHDG	98.9 ¹
HOMEOWNR	F4HHOSE	Participant's housing status at time of fourth follow-up	97.5
HRSWEEK	F4BLHPW	Hours worked per typical week in 1999	93.5 ⁴
INCOME99	F4HI99	Income in 1999	92.0
LANGMINR	BYLM	Language minority composite	99.9
LIVEPARN	F4GNGRD	Parents/guardians in participant's household in fourth follow-up	97.6
LOGINCME	Derived	Logarithm of 1999 income, respondents who worked for pay	92.0
MARRIED	F4GMRS	Marital status in fourth follow-up	99.6
MOBILITY	BYP40	Number of times eighth grader has changed schools	91.5
MOTHERED	BYS34B	Student report of mother's highest level of education attained	86.7
SIBLINGS	BYP3A	Number of eighth grader's siblings	91.9
TOTCRED	TCREDN	Total undergraduate credits earned	84.9 ⁵
UTILITY	Derived	Student rating of the usefulness of subjects	93.4
VOLNTEER	Derived	Indicator of whether participant volunteered at fourth follow-up	97.6
VOTED	F4IVPRE	Indicator of whether participant voted in 1996 election	96.6

¹Out of 2,264 cases who entered postsecondary education.

²Used G8LUNCH and F1C30A; grade 10 data used if grade 8 not available.

³An additional 18.2 percent responded 'Don't know;' total response rate was 97.0 percent.

⁴This variable was also used for consistent employment calculation; 95.2 percent of cases provided usable information.

⁵Unweighted response rate was 88.2 percent.

NOTE: See appendix D for details of measures used in this study.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Appendix B. Standard Errors Tables

Table B-A. Standard errors for table A: High school attainment groups of status risk students, by postsecondary education and employment/income outcomes: 2000

Outcome	High school attainment group		
	Successful completers ¹	Marginal completers ²	Noncompleters ³
Percent of status risk students	1.14	1.53	1.55
Percent who entered a postsecondary institution ⁴	2.66	1.80	2.80
< 2-year school	0.51 !	0.70	0.85
2-year school	2.32	1.95	2.62
4-year school	2.54	1.36	0.66 !
Mean credits earned in postsecondary institutions ^{5,6,7}	2.35	1.95	2.06
Percent completed postsecondary education ⁶	2.32	2.18	4.57
Percent currently employed (2000)	1.38	1.29	2.31
Consistent employment mean 1997–1999 ⁸	0.031	0.038	0.059

! Interpret data with caution. Unweighted $n < 30$.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Classified by type of first institution attended. Values based on total number of successful completers, marginal completers, and noncompleters in status risk sample.

⁵Credits earned from all schools attended.

⁶Values based on total number of successful completers, marginal completers, and noncompleters who entered postsecondary education.

⁷Response rate on this variable less than 85 percent.

⁸0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-1. Standard errors for table 1: Status risk sample, by demographic characteristics: 1988

Characteristic	Weighted SE ¹
All	†
Gender	
Male	1.60
Female	1.44
Race	
White, not Hispanic	1.35
Black, not Hispanic	3.41
Hispanic	3.52
Native American, Alaska Native	4.08
Asian, Pacific Islander	2.77
School urbanicity - 8th grade	
Urban	2.60
Suburban	1.77
Rural	2.36
School type - 8th grade	
Public	1.48
Catholic	2.43
Other ²	0.67

† Not applicable.

¹Standard errors weighted by F4PNLWT.

²Includes "private other religion" and "private nonreligious."

NOTE: Status risk classification based on eighth grade (base year) student and school socioeconomic status.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-2. Standard errors for table 2: Percentage distribution of status risk and non-status risk students, by selected demographic and school characteristics: 1988

Group	Percentage of status risk sample		Percentage of non-status risk students			
	Low-SES home Low-SES school		All	Low-SES home High-SES school	High-SES home Low-SES school	High-SES home High-SES school
Total		†	†	†	†	†
Gender						
Male	1.43		0.85	1.59	1.53	1.36
Female	1.43		0.85	1.59	1.53	1.36
Race/ethnicity						
White, not Hispanic	2.36		1.12	2.36	2.15	1.26
Black, not Hispanic	1.89		0.88	1.87	1.82	1.08
Hispanic	1.88		0.60	1.66	0.93	0.57
Native American, Alaska Native	0.84		0.31	0.18	1.00	0.10
Asian, Pacific Islander	0.34		0.34	0.73	0.69	0.45
School urbanicity - 8th grade						
Urban	2.57		1.61	2.35	2.83	2.25
Suburban	2.45		2.00	3.26	2.68	2.62
Rural	2.81		1.68	3.01	2.89	1.78
School type - 8th grade						
Public	0.55		0.88	1.77	0.88	1.81
Catholic	0.54		0.79	1.67	0.65	1.51
Other ¹	0.09		0.46	0.62	0.61	1.08

† Not applicable.

¹Includes 'private other religion' and 'private non-religious.'

NOTE: Status risk classification based on eighth grade (base year) student and school socioeconomic status.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-3. Standard errors for table 3: Status risk sample and non-status risk students, by selected home-related characteristics: 1988

Characteristic	Status risk sample		Non-status risk students			
	Low-SES home Low-SES school	All	Low-SES home High-SES school	High-SES home Low-SES school	High-SES home High-SES school	
Percent 1987 annual household income over \$19,999 ¹	1.63	0.77	2.01	1.06	0.36	
Percent father's education beyond high school ²	1.24	1.19	1.44	1.66	1.20	
Percent mother's education beyond high school ²	1.16	1.05	1.75	1.68	1.29	
Percent living with two biological parents ²	1.62	0.94	1.68	1.64	1.53	
Percent non-English speaking home ³	1.99	0.69	1.78	1.27	0.61	
Mean number of siblings ¹	0.05	0.03	0.05	0.05	0.05	
Mean number of times changed schools ¹	0.06	0.03	0.05	0.06	0.05	

¹Base year parent questionnaire²Base year student questionnaire³Composite of base year student and teacher questionnaire

NOTE: Status risk classification based on eighth grade (base year) student and school socioeconomic status.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-4. Standard errors for table 4: Percentage distribution of status risk students in each attainment group, by gender and race/ethnicity: 1988

Group	Percentage in each attainment group		
	Successful completers ¹	Marginal completers ²	Noncompleters ³
Total	†	†	†
Gender			
Male	2.51	1.87	3.20
Female	2.51	1.87	3.20
Race/ethnicity			
White, not Hispanic	3.02	2.67	3.76
Black, not Hispanic	2.74	2.45	2.79
Hispanic	1.65	2.28	2.76
Native American, Alaska Native	0.43 !	0.87	1.32 !
Asian, Pacific Islander	0.50	0.43	0.36 !

† Not applicable.

! Interpret data with caution. Unweighted $n < 30$.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-5. Standard errors for table 5: High school attainment groups of status risk students, by postsecondary education outcomes: 2000

Outcome	High school attainment group			
	All	Successful completers ¹	Marginal completers ²	Noncompleters ³
Percent who entered a postsecondary institution ⁴	1.56	2.66	1.80	2.80
< 2-year school	0.45	0.51	0.70	0.85
2-year school	1.53	2.32	1.95	2.62
4-year school	0.94	2.54	1.36	0.66
Mean credits earned in postsecondary institutions ^{5,6,7}	1.75	2.35	1.95	2.06
< 2-year school	2.63	8.01	3.41	3.37
2-year school	2.03	4.26	2.08	2.24
4-year school	3.08	2.76	5.09	10.88
Percent completed postsecondary education ⁶	1.67	2.32	2.18	4.57
Certificate/license	1.16	1.28	1.47	4.66
Associate's degree	0.89	1.65	1.20	1.51
Bachelor's degree or higher	1.04	2.13	1.10	0.53

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Classified by type of first institution attended. Values based on total number of successful completers, marginal completers, and noncompleters in status risk sample.

⁵Credits earned from all schools attended, classified by type of first institution attended.

⁶Values based on total number of successful completers, marginal completers, and noncompleters who entered postsecondary education.

⁷Response rate on this variable less than 85 percent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-6. Standard errors for table 6: High school attainment groups of status risk students, by employment/income outcomes: 2000

Outcome	High school attainment group			
	All	Successful completers ¹	Marginal completers ²	Noncompleters ³
Percent currently employed (2000)	0.94	1.38	1.29	2.31
Percent employed full-time (2000) ⁴	0.88	1.31	1.34	1.77
Mean number of hours worked per week (1999) ⁵	0.38	0.51	0.45	0.93
Consistent employment mean 1997-1999 (all) ⁶	0.027	0.031	0.038	0.059
No postsecondary education	0.047	0.067	0.065	0.081
Some postsecondary education, no degree	0.035	0.059	0.048	0.106
Certificate/license	0.119	0.103	0.172	0.174
Associate's degree	0.044	0.089	0.055	0.211
Bachelor's degree or higher	0.036	0.049	0.055	0.368

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Of those currently employed.

⁵Of those employed in 1999; annual income data were only available for 1999.

⁶0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table B-7. Standard errors for table 11: Mean engagement measures of high school attainment groups: 1990

Engagement measure	High school attainment group			
	All	Successful completers ¹	Marginal completers ²	Noncompleters ³
Attendance ⁴	0.019	0.025	0.023	0.052
Classroom behavior ⁵	0.044	0.048	0.056	0.078
Extracurricular participation ⁶	0.053	0.080	0.066	0.119
Usefulness of school subjects ⁷	0.018	0.033	0.025	0.036

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high-school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴How often a student is absent or tardy, range: 1-5.

⁵Teacher rating of student's behavior, range: 1-4.

⁶Participation in extracurricular activities, range: 0-6.

⁷Student rating of the usefulness of math, English, social studies and science, range: 1-4.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Appendix C. Other Statistical Tables

Table C-1. Unweighted sample sizes of attainment groups, by demographic characteristics: 1988

Group	Unweighted number in each attainment group		
	Successful completers ¹	Marginal completers ²	Noncompleters ³
Total	870	1,950	680
Gender			
Male	350	910	310
Female	530	1,040	370
Race/ethnicity			
White, not Hispanic	620	1,000	360
Black, not Hispanic	50	370	110
Hispanic	130	460	180
Native American, Alaska Native	10	40	20
Asian, Pacific Islander	70	90	20
School urbanicity - 8th grade			
Urban	170	520	200
Suburban	260	570	210
Rural	440	860	270
School type - 8th grade			
Public	820	1,900	670
Catholic	40	40	10
Other private ⁴	#	#	#

Rounds to zero.

¹In school in twelfth grade in 1992; "reasonable" scores on reading and mathematics tests; passing grades; graduated from high school.

²Test scores not "reasonable" and/or grades not passing; high school graduate.

³Dropped out by 1992, or not in twelfth grade in 1992 and did not earn diploma by age 20.

⁴Includes "private other religion" and "private nonreligious."

NOTE: Values rounded to protect data confidentiality.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table C-2. Strength-of-effect measures for table 5: High school attainment groups, by postsecondary education outcomes: 2000

Outcome	High School Attainment Group	
	Successful Completers - Marginal Completers	Noncompleters - Marginal Completers
Percent who entered a postsecondary institution ¹	2.39 *	0.20 *
< 2-year school	0.27 *	0.81
2-year school	0.67 *	0.37 *
4-year school	4.00 *	0.12 *
Mean credits earned in postsecondary institutions ^{2,3,4}	0.80 σ *	-0.68 σ *
< 2-year school	0.52 σ	-0.56 σ *
2-year school	0.68 σ *	-0.60 σ *
4-year school	0.51 σ *	-0.86 σ *
Percent completed postsecondary education ³	1.72 *	0.68
Certificate/license	0.34 *	1.79 *
Associate's degree	0.90	0.34 *
Bachelor's degree or higher	4.38 *	0.08 *

* $p < .05$ ¹Classified by type of first institution attended. Values based on total number of successful completers, marginal completers, and noncompleters in status risk sample.²Credits earned from all schools attended, classified by type of first institution attended.³Values based on total number of successful completers, marginal completers, and noncompleters who entered postsecondary education.⁴Response rate on this variable less than 85 percent.

NOTE: Strength-of-effect measures for percents are odds ratios. Strength-of-effect measures for means are mean differences in standard deviation units. Contrasts tested for significance only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table C-3. Strength-of-effect measures for table 6: High school attainment groups, by employment/income outcomes: 2000

Outcome	High school attainment group	
	Successful Completers - Marginal Completers	Noncompleters - Marginal Completers
Percent currently employed (2000)	1.23	0.53 *
Percent employed full-time (2000) ¹	0.96	1.02
Mean number of hours worked per week (1999) ²	-0.07 σ	0.12 σ
Consistent employment mean 1997-1999 (all) ³	0.12 σ *	-0.31 σ *
No postsecondary education	0.26 σ *	-0.30 σ *
Some postsecondary education, no degree	0.06 σ	-0.30 σ
Certificate/license	0.26 σ	0.08 σ
Associate's degree	0.05 σ	-0.11 σ
Bachelor's degree or higher	0.05 σ	0.05 σ
Median 1999 annual income (all) ²	0.18 σ *	-0.18 σ
No postsecondary education	0.12 σ	-0.19 σ
Some postsecondary education, no degree	0.07 σ	-0.25 σ
Certificate/license	0.36 σ	0.19 σ
Associate's degree	0.19 σ	0.16 σ
Bachelor's degree or higher	-0.03 σ	-0.52 σ

* $p < .05$ ¹Of those currently employed.²Of those employed in 1999; annual income data were only available for 1999.³0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.

NOTE: Strength-of-effect measures for percents are odds ratios. Strength-of-effect measures for means are mean differences in standard deviation units. Contrasts tested for significance only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table C-4. Strength-of-effect measures for table 11: Mean engagement measures of high school attainment groups: 1990

Outcome	High school attainment group	
	Successful completers - Marginal Completers ¹	Noncompleters - Marginal Completers ¹
Attendance ²	0.40 σ *	0.82 σ *
Classroom behavior ³	0.72 σ *	0.70 σ *
Extracurricular participation ⁴	0.24 σ *	0.29 σ *
Usefulness of school subjects ⁵	0.12 σ	-0.04 σ

* $p < .05$ ¹Effect sizes; mean differences in standard deviation units.²How often a student is absent or tardy, range: 1-5.³Teacher rating of student's behavior, range: 1-4.⁴Participation in extracurricular activities, range: 0-6.⁵Student rating of the usefulness of math, English, social studies and science, range: 1-4.

NOTE: Strength-of-effect measures estimated for main effects only. Contrasts tested for significance only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table C-5. Regression results for postsecondary education outcomes, by engagement factors and attainment groups: 2000

Predictor variable	Entering a postsecondary institution	For those who entered postsecondary education	
		Number of credits earned ¹	Completing a program of study
Gender (M - F)	-0.41 * (0.141)	-3.60 (2.580)	-0.35 * (0.129)
Race/ethnicity			
Black - White	0.49 * (0.230)	-1.24 (4.649)	-0.22 (0.205)
Hispanic - White	1.08 * (0.198)	-2.61 (3.661)	-0.27 (0.172)
Native American - White	-0.54 (0.353)	-20.45 * (4.873)	-0.68 (0.427)
Asian - White	1.17 * (0.364)	10.23 (5.723)	-0.27 (0.223)
Urbanicity			
Suburban - Urban	0.11 (0.214)	0.39 (3.729)	-0.02 (0.189)
Rural - Urban	-0.13 (0.207)	5.32 (3.497)	0.20 (0.171)
Type of postsecondary institution			
< 2-year - 2-year	†	-4.62 (3.540)	1.74 * (0.243)
4-year - 2-year	†	35.49 * (3.149)	0.45 * (0.142)
Engagement			
Attendance	0.10 0.138	11.34 * (2.817)	0.26 (0.134)
Classroom behavior	0.17 * (0.063)	2.83 * (1.089)	0.09 (0.051)
Extracurricular participation	0.14 * (0.038)	1.11 (0.813)	0 (0.034)
Usefulness of school subjects	-0.05 (0.116)	1.19 (2.083)	0.07 (0.107)
Attainment group			
(A1) Successful completers - Marginal completers	0.99 * (0.192)	17.69 * (3.400)	0.27 * (0.135)
(A2) Noncompleters - Marginal completers	-1.22 * (0.195)	-15.11 * (3.370)	-0.65 * (0.256)

† Not applicable.

* $p < .05$ ¹Response rate on this variable less than 85 percent.

NOTE: Table contains unstandardized regression coefficients. Standard errors in parentheses. Each coefficient is a contrast, group A minus group B (positive if group A has the higher value; negative if group B has the higher value). For effects with two or more contrasts, individual contrasts tested only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Table C-6. Regression results for employment/income outcomes, by engagement factors and attainment groups: 2000

Predictor variable	Employed in 2000	Consistent employment ¹	1999 Annual income ^{2,3}
Gender (M - F)	1.20 *	0.42 *	0.40 *
	(0.193)	(0.049)	(0.063)
Race/ethnicity			
Black - White	0.33	-0.06	-0.34 *
	(0.307)	(0.091)	(0.122)
Hispanic - White	0.40	0.05	0.01
	(0.213)	(0.067)	(0.059)
Native American - White	-0.60	-0.44	-0.25 *
	(0.351)	(0.189)	(0.119)
Asian - White	0.29	-0.10	-0.13
	(0.324)	(0.114)	(0.102)
Urbanicity			
Suburban - Urban	0.28	0.16	0.12
	(0.234)	(0.080)	(0.093)
Rural - Urban	0.38	0.17	0.03
	(0.230)	(0.079)	(0.085)
Postsecondary education completed			
Some PSE, no degree - None	0.16	0.07	-0.04
	(0.224)	(0.068)	(0.091)
Certificate/license - None	0.58	0.04	-0.04
	(0.325)	(0.125)	(0.133)
Associate's degree - None	1.91 *	0.18	0.11
	(0.437)	(0.067)	(0.080)
Bachelor's degree or higher - None	0.67 *	0.06	0.28 *
	(0.253)	(0.073)	(0.086)
Engagement			
Attendance	-0.03	0.08	0.07
	(0.165)	(0.049)	(0.057)
Classroom behavior	0.17	0.01	-0.02
	(0.092)	(0.023)	(0.017)
Extracurricular participation	-0.05	-0.02	-0.01
	(0.043)	(0.014)	(0.014)
Usefulness of school subjects	-0.35	-0.12 *	0.05
	(0.138)	(0.044)	(0.054)
Attainment Group			
(A1) Successful completers - Marginal completers	0.05	0.11 *	0.05
	(0.175)	(0.042)	(0.050)
(A2) Noncompleters - Marginal completers	-0.45	-0.24 *	-0.22
	(0.248)	(0.099)	(0.133)

* $p < .05$ ¹0.0 to 3.0 indicator of part-time/full-time employment 1997–1999.²Of those employed in 1999; annual income data were only available for 1999.³Log 1999 income in dollars.

NOTE: Table contains unstandardized regression coefficients. Standard errors in parentheses. Each coefficient is a contrast, group A minus group B (positive if group A has the higher value; negative if group B has the higher value). For effects with two or more contrasts, individual contrasts tested only when the overall test of differences among the groups was significant.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/2000).

Appendix D. Variables Used in This Report

This appendix provides details about how the measures used in this study were obtained from the NELS:88 data files. The data were gathered from three files:

- (1) NELS:88/2000 Public Use Data Files and Electronic Codebook: Base Year through Fourth Follow-Up
- (2) NELS:88/2000 Restricted Use Data Files and Electronic Codebook: Base Year through Fourth Follow-Up
- (3) NELS:88/2000 Restricted Use Postsecondary Education Transcript Study (PETS: 2000) Data Files and Electronic Codebook: Fourth Follow-Up

Variables are from the NELS:88/2000 Public Use Data Files unless indicated otherwise. Ranges provided are for the status risk sample used in this study. Information about each of the missing values codes is available in the National Longitudinal Study: 1988-2000 Data Files and Electronic Codebook System (NCES 2002).

Appendix D Variables Used in This Report

VARIABLE NAME	Variables Used in This Report DESCRIPTION	SOURCE VARIABLE NAME	VALUES
<u>Weight and Design Variables</u>			
F4PNLWT STRATUM PSU	Panel weight, BY, F1, F2, F3 and F4 Sampling stratum Primary sampling unit	F4PNLWT STRATUM PSU	Range = 25.8022 to 10370.88 Range = 2 to 79 Range = 0 to 999
<u>Variables Used to Choose Status Risk Sample</u>			
BYSES G8LUNCH F1C30A	Socioeconomic status composite; constructed from parents' education, parents' occupations, and household income Percent of students in grade 8 school who receive free lunch Percent of students in grade 10 school who receive free lunch	BYSES G8LUNCH ¹ F1C30A ¹	Range = -2.875 to -.072
<u>Variables Used to Assign Attainment Group</u>			
BY2XCOMP F12XCOMP F1S39A F1S39B F1S39C F1S39D F4UNI2D F3DIPLOM	Standardized achievement test composite, reading and math, grade 8 Standardized achievement test composite, reading and math, grade10 Respondent's self-reported math grades, grade 10 Respondent's self-reported English grades, grade 10 Respondent's self-reported history grades, grade 10 Respondent's self-reported science grades, grade 10 Second follow-up status of sample member Third follow-up high school diploma/GED status	BY2XCOMP F12XCOMP F1S39A F1S39B F1S39C F1S39D F4UNI2D F3DIPLOM	Range = 30.93 to 75.05 Range = 30.31 to 70.08 1 = Not taking subject 2 = Mostly A's 3 = Half A and half B 4 = Mostly B's 5 = Half B and half C 6 = Mostly C's 7 = Half C and half D 8 = Mostly D's 9 = Mostly below D 96 to 99 = Missing 1 = In school, in 12th grade 2 = In school, not in 12th grade 3 = Dropout 6 = Status unknown 1 = Rec'd a high school diploma 2 = Rec'd a GED 3 = Rec'd a certificate 4 = Currently in high school 5 = Working toward equivalency 6 = Not graduate, GED or cert. -6, -9 = Missing

D-2

¹Data source is the NELS:88 Restricted-Use Data File

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
<u>Variables Used to Assign Attainment Group (continued)</u>			
ATTNGRP	<p>Attainment group; determined by:</p> <p>1) Math, English, history and science grades in grade 10 - F1S39A, F1S39B, F1S39C, F1S39D</p> <p>2) Math and reading composite test scores in grades 8 and 10 - BY2XCOMP, F12XCOMP</p> <p>3) Student status at second follow-up - F2UNI2D</p> <p>4) Diploma status at third follow-up - F3DIPLOM</p> <p><i>Successful completer:</i> Grade 10 average grades of B's and C's or better, and grade 8 and 10 composite scores $\geq 1/4$ SD below the mean, and in school and in grade 12 at second follow-up</p> <p><i>Marginal completer:</i> Grade 10 average grades, or grade 8 or 10 composite score, do not meet successful completer criteria; or in school but not in grade 12 at second follow-up, but did receive a high school diploma by third follow-up</p> <p><i>Noncompleter:</i> Dropped out by second follow-up, or in school but not in grade 12 at second follow-up and did not receive a high school diploma by third follow-up</p>	Derived	<p>1 = Successful completer</p> <p>2 = Marginal completer</p> <p>3 = Noncompleter</p>
<u>Demographic Variables</u>			
F4SEX	Gender of respondent	F4SEX	<p>1 = Male</p> <p>2 = Female</p>
F4RACE	Race of respondent	F4RACE	<p>1 = Asian, Pacific Islander</p> <p>2 = Hispanic</p> <p>3 = Black, not Hispanic</p> <p>4 = White, not Hispanic</p> <p>5 = Native Am., Alaskan Native</p> <p>-9 = Missing</p>
G8URBAN	Urbanicity of school, grade 8	G8URBAN	<p>1 = Urban</p> <p>2 = Suburban</p> <p>3 = Rural</p> <p>9 = Missing</p>
G8TYPE	School classification reported by school, grade 8	G8CTRL	<p>1 = Public school</p> <p>2 = Catholic school</p> <p>3 = Private, other religion</p> <p>4 = Private, non-religious</p> <p>9 = Missing</p>
G10TYPE	School classification reported by school, grade 10	G10CTRL1	<p>1 = Public school</p> <p>2 = Catholic school</p> <p>3 = Private, other religion</p> <p>4 = Private, non-religious</p> <p>5 = Private, not ascertained</p> <p>98, 99 = Missing</p>

Appendix D Variables Used in This Report

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
D-4	<u>Base Year Family Characteristics</u>		
	FAMILYINC Base year parent report of total family income from all sources	BYFAMINC	1 = None 2 to 15 = 14 intervals from less than \$1,000 to \$200,000 or more 98, 99 = Missing
	FATHERED Student report of father's highest level of education attained	BYS34A	1 = Did not finish high school
	MOTHERED Student report of mother's highest level of education attained	BYS34B	2 = Graduated from high school 3 = Junior college 4 = College, less than 4 years 5 = Graduated from college 6 = Master's degree 7 = Ph.D., M.D., etc. 8, 97, 98, 99 = Missing
	FAMCOMP Family composition composite; used to determine percent living with two biological parents	BYFCOMP	1 = Mother and father 2 = Mother and male guardian 3 = Father and female guardian 4 = Mother only 5 = Father only 6 = Other relative/non-relative 98, 99 = Missing
	LANGMINR Language minority composite; used to determine percent from non-English speaking home	BYLM	0 = Not language minority 1 = Language minority 8, 9 = Missing
	SIBLINGS Number of eighth-grader's siblings	BYP3A	0 to 6 = Number of siblings, 0 to 6+ 96, 98, 99 = Missing
MOBILITY Number of times eighth grader has changed schools	BYP40	0 to 5 = Number of changes, 0 to 5+ 98, 99 = Missing	

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
<u>Adult Lifestyle Characteristics</u>			
F4IYOUTH	Youth organization volunteer	F4IYOUTH	0 = No 1 = Yes -1, -2, -7 = Missing
F4ICIVIC	Civic/community volunteer	F4ICIVIC	0 = No 1 = Yes -1, -2, -7 = Missing
VOLNTEER	Indicator of whether participant was doing volunteer work at time of fourth follow-up; composite of responses to F4IYOUTH and F4ICIVIC: if the value of either variable was 1, the value of VOLNTEER was set to 1	Derived	0 = Not a volunteer 1 = Volunteer -9 = Missing
VOTED	Indicator of whether participant voted in the 1996 presidential election	F4IVPRE	0 = No 1 = Yes -1, -2, -7 = Missing
HOMEOWNR	Participant's housing status at time of fourth follow-up; used to determine percent who own home	F4HHOSE	1 = Own/buying living quarters 2 = Rent, not from relative 3 = Rent from relative 4 = Live in residence w/out paying -1, -2, -7 = Missing
LIVEPARN	The number of parents/guardians in the participant's household in the fourth follow-up; used to determine percent who live with parents	F4GNGRD	0 = None 1 = One 2 = Two -1, -2, -3, -7 = Missing
MARRIED	Marital status in fourth follow-up; used to determine percent married	F4GMRS	1 = Single, never married 2 = Married 3 = Divorced 4 = Separated 5 = Widowed 6 = In marriage-like relationship -1, -2, -7 = Missing
CHILDREN	Number of biological children; used to determine percent with one or more children	F4GNCH	0 to 8 = Number of biological children -1, -2, -7 = Missing

D-6

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
<u>Postsecondary Education Measures</u>			
REFITYPE	Carnegie type of first institution	REFITYPE ¹	1 = Doctoral 2 = Comprehensive 3 = Baccalaureate 4 = Specialized 4-year 5 = Community college 6 = Other 2-year 7 = Sub-Associate's -1, -8, 8 = Missing
FRSTINST	Type of first institution entered; derived using REFITYPE ¹ - values 1 to 4 were coded as 4-year institutions, values 5 and 6 were coded as 2-year institutions, value 7 was coded as <2-year institution <i>Alternative data:</i> F4EFSECT - sector for first postsecondary institution entered REFINST ¹ - type of first institution; more comprehensive categories than REFITYPE ¹	Derived	0 = no postsecondary education 1 = entered a <2-year institution 2 = entered a 2-year institution 3 = entered a 4-year institution -9 = Missing
<i>ENTERPSE</i>	Entered postsecondary education; recoded from FRSTINST	Derived	0 = did not enter PSE 1 = entered PSE -9 = Missing
<i>TOTCRED</i>	Total undergraduate credits earned	TCREDN ¹	-1, -8 = Missing
F4HHDG	Highest postsecondary education degree attained as of 2000	F4HHDG	1 = Some PSE, no degree attained 2 = Certificate/license 3 = Associate's degree 4 = Bachelor's degree 5 = Master's degree/equivalent 6 = Ph.D./professional degree -3, -9 = Missing
HIGHDEGR	Highest postsecondary education degree attained; recoded F4HHDG - categories for Bachelor's degree, Master's degree and Ph.D./professional degree were collapsed into 'Bachelor's degree or higher'	Derived	1 = Some PSE, no degree attained 2 = Certificate/license 3 = Associate's degree 4 = Bachelor's degree or higher -3, -9 = Missing
<i>COMPPSE</i>	Completed postsecondary education; recoded from HIGHDEGR	Derived	0 = did not complete PSE 1 = completed PSE -9 = Missing

¹Data source is the NELS:88 Restricted-Use Transcript Study Data File

Note: Variables with names in italics were outcome measures in regression analyses

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
	<u>Employment/Income Measures</u>		
<i>EMPLOYED</i>	Employed for pay at fourth follow-up	F4AEMPL	0 = No 1 = Yes -2 = Missing
FULLTIME	Fourth follow-up employment is full-time	F4AACTF	0 = No 1 = Yes -2 = Missing
F4BWKSWK	Weeks worked in 1999	F4BWKSWK	Range = 0 to 52 -1, -2, -3, -8 = Missing
HRSWEEK	Hours worked per typical week in 1999	F4BLHPW	Range = 1 to 80 -1, -2, -3, -8 = Missing
INCOME99	Income of respondent in 1999	F4HI99	Range = 0 to 500,000 -1, -2, -3, -7 = Missing
<i>LOGINCME</i>	Logarithm of 1999 income	Derived	-9 = Missing
F4BJ97A	Employed for at least six months in 1997	F4BJ97A	0 = No 1 = Yes -1, -2, -3, -7 = Missing
F4BJ97B	Held employment full time in 1997	F4BJ97B	1 = Full time 2 = Part time -1, -2, -3, -7 = Missing
F4BJ98A	Employed for at least six months in 1998	F4BJ98A	0 = No 1 = Yes -1, -2, -3, -7 = Missing
F4BJ98B	Held employment full time in 1998	F4BJ98B	1 = Full time 2 = Part time -1, -3, -7 = Missing
<i>CNSTEMPL</i>	Constancy of employment across three years, 1997-1999; derived from six variables: F4BJ97A, F4BJ97B, F4BJ98A, F4BJ98B, F4BWKSWK, HRSWEEK <i>Score:</i> The sum of points based on amount of employment: 1 point for each year respondent worked full-time and 0.77 points for each year of part-time work. For 1999, respondents who worked at least 26 weeks were considered employed; those who typically worked 37 hours or more per week were considered full-time. <i>Minimum data:</i> If data were not available for any year, a consistent employment score was not computed.	Derived	Range = 0 to 3 -9 = Missing

D-7

Note: Variables with names in italics were outcome measures in regression analyses

Appendix D Variables Used in This Report

D-8

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
	<u>Engagement Measures</u>		
F1T1_16	How often student is absent; responses from two grade 10 teachers	F1T1_16	1 = Never
F1T5_16		F1T5_16	2 = Rarely
F1T1_17	How often student is tardy; responses from two grade 10 teachers	F1T1_17	3 = Some of the time
F1T5_17		F1T5_17	4 = Most of the time
			5 = All of the time
			6, 96, 98, 99 = Missing
ABSTARDY	<p>How often student is absent or tardy; derived from four variables: F1T1_16, F1T5_16, F1T1_17, F1T5_17</p> <p><i>Alternative data:</i> When grade 10 data were missing, grade 12 measures were used.</p> <p><i>Minimum data:</i> At least two teachers' responses from grade 10 or grade 12 were required.</p> <p><i>Score:</i> ABSTARDY is the average of the available responses. The scale was reversed so higher scores meant better attendance.</p>	Derived	Range = 1 to 5 -9 = Missing
F1T1_2	Student usually works hard; responses from two grade 10 teachers	F1T1_2	1 = Yes
F1T5_2		F1T5_2	2 = No
			3, 6, 8, 9 = Missing
F1T1_15	How often student does homework; responses from two grade 10 teachers	F1T1_15	1 = Never
F1T5_15		F1T5_15	2 = Rarely
F1T1_18	How often student is attentive in class; responses from two grade 10 teachers	F1T1_18	3 = Some of the time
F1T5_18		F1T5_18	4 = Most of the time
F1T1_20	How often student is disruptive in class; responses from two grade 10 teachers	F1T1_20	5 = All of the time
F1T5_20		F1T5_20	6, 96, 98, 99 = Missing
CLASSBEH	<p>Teacher rating of student's classroom behavior; derived from eight variables: F1T1_2, F1T5_2, F1T1_15, F1T5_15, F1T1_18, F1T5_18, F1T1_20, F1T5_20</p> <p><i>Alternative data:</i> When grade 10 data were missing, grade 12 measures were used. In grade 12, teachers were not asked if students work hard. To determine class behavior scores using grade 12 data, the mean of the grade 10 measure of working hard, for all cases with a class behavior score, was used, .54.</p> <p><i>Minimum data:</i> At least one teacher's responses to all four questions in grade 10, or all three questions in grade 12, was required.</p> <p><i>Score:</i> The CLASSBEH score was computed by summing points based on the average of two teachers' responses to each question: 1 point if 'works hard' = 1; 1 point if 'does homework' ≥ 4; 1 point if 'is attentive' ≥ 4; 1 point if 'is disruptive' ≤ 2</p>	Derived	Range = 0 to 4 -9 = Missing

VARIABLE NAME	DESCRIPTION	SOURCE VARIABLE NAME	VALUES
	<u>Engagement Measures (continued)</u>		
F1S41AA	Played baseball/softball at school	F1S41AA	1 = School does not have
F1S41AB	Played basketball at school	F1S41AB	2 = Did not participate
F1S41AC	Played football at school	F1S41AC	3 = Intramural sports
F1S41AD	Played soccer at school	F1S41AD	4 = Junior varsity team
F1S41AE	Participated on swim team at school	F1S41AE	5 = Varsity team
F1S41AF	Played other team sport	F1S41AF	6 = Captain Co-Captian
F1S41AG	Played an individual sport	F1S41AG	96, 98, 99 = Missing
F1S41AH	Participated in cheerleading	F1S41AH	
F1S41AI	Participated on pom-pom, drill team	F1S41AI	
F1S41BA	Participated in school band, orchestra	F1S41BA	1 = School does not offer
F1S41BB	Participated in school play, musical	F1S41BB	2 = Did not participate
F1S41BC	Participated in student government	F1S41BC	3 = Participated
F1S41BD	Participated in academic honor society	F1S41BD	4 = Participated officer
F1S41BE	Participated in school yearbook, newspaper	F1S41BE	6, 8, 9 = Missing
F1S41BG	Participated in school academic clubs	F1S41BG	
EXTRACUR	Participation in extracurricular activities; derived from student report of participation in 15 extracurricular activities - F1S41AA-AI, F1S41BA-BE, F1S41BG <i>Alternative data:</i> When grade 10 information was not available, grade 12 data were used <i>Minimum data:</i> At least one valid response to a question about extracurricular participation was required for the student to receive an EXTRACUR score <i>Score:</i> EXTRACUR is the number of extracurricular activities a student reported participating in	Derived	0 to 6 = Number of activities, -9 = Missing
BYS69C	Math will be useful in my future	BYS69C	1 = Strongly agree
BYS70C	English will be useful in my future	BYS70C	2 = Agree
BYS71C	Social Studies will be useful in my future	BYS71C	3 = Disagree
BYS72C	Science will be useful in my future	BYS72C	4 = Strongly disagree
UTILITY	Utility score; student rating of the usefulness of math, English, social studies and science; derived from base year student responses to BY69C, BY70C, BY71C, BY72C <i>Minimum data:</i> At least two responses were required for student to receive a UTILITY score <i>Score:</i> Average of available responses; reverse-scaled so higher value was more favorable	Derived	Range = 1 to 4 -9 = Missing

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