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High School Longitudinal Study of 2009 (HSLS:09) Second Follow-Up

A First Look at Fall 2009 Ninth-Graders in 2016

NCES 2018-139

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High School Longitudinal Study of 2009 (HSLS:09) Second Follow-Up:

A First Look at Fall 2009 Ninth-Graders in 2016

February 2018

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Introduction

Focus of this Report

This report presents selected findings from the second follow-up of the High School Longitudinal Study of 2009 (HSLS:09). HSLS:09 follows a nationally representative sample of students who were ninth-graders in fall 2009 from the beginning of high school into higher education and the workforce. Key research topics for HSLS:09 include secondary to postsecondary transition plans and the evolution of those plans; paths into and out of science, technology, engineering, and mathematics (STEM) studies and careers; and the relationships between students' school experiences (educational and social) and their academic, work, and life plans and paths.

The second follow-up data collection was conducted from March 14, 2016, through January 31, 2017, approximately 3 years after high school graduation for most of the cohort. The data collected allow researchers to examine an array of young-adulthood outcomes among fall 2009 ninth-graders, including delayed high school completion, postsecondary enrollment, early postsecondary persistence and attainment, labor market experiences, family formation, and family financial support. Analyses of these outcomes can capitalize on the large amounts of data gathered about the students in fall 2009, in 2012 (when most were spring-term 11th-graders), and in summer and fall 2013 (when most had completed high school). Analyses can also be augmented with information collected from parents, teachers, administrators, counselors, and high school transcripts.

This report highlights selected findings from the HSLS:09 second follow-up data with the goal of encouraging interested researchers to explore the data for their own analytic purposes. Therefore, the report provides information on a range of outcomes, although HSLS:09 offers much more data than those used in the analyses in this report. Readers should note that, because this report is descriptive in nature, it is not appropriate to draw causal inferences from the results presented. For example, many of the variables examined in this report may be related to one another, and complex interactions and relationships among the variables have not been explored in these analyses.

All results have been weighted to reflect the sample design and to account for nonresponse and other adjustments. Comparisons drawn in the selected findings have been tested for statistical significance at the .05 level using Student's *t* statistics to ensure that the differences are larger than those that might be expected due to

sampling variation. While the selected findings only include statistically significant findings, they do not include every statistically significant comparison. There were no adjustments for multiple comparisons. Detail may not sum to totals because of rounding.

Additional information about the HSLS:09 dataset and the methods employed in collecting and processing the data can be found in appendix C, and greater detail is available in the *HSLS:09 Base-Year to Second Follow-Up Data File Documentation* (Duprey et al. 2018), at https://nces.ed.gov/surveys/hsls09/.

Study Design

HSLS:09 is a longitudinal study of a nationally representative sample of approximately 20,000 ninth-graders. HSLS:09 used a two-stage sample design. First, high schools, defined as schools with both a ninth and an eleventh grade in fall 2009, were sampled, and then students were sampled from each school's ninth grade in the fall term. The sampled schools consist of private and public schools, including charter and magnet schools, that provided instruction in the 50 states and District of Columbia. More information about the sample design, including classification of ineligible cases, is available in appendix C.

The HSLS:09 dataset contains data, collected from several sources, on students and their school and home environments. The base-year data collection featured a student survey and mathematics assessment as well as surveys completed by school administrators, school counselors, science teachers, mathematics teachers, and parents of the sampled students. The first follow-up of HSLS:09 occurred in spring 2012, when most sample members were in the 11th grade, and included a student survey and mathematics assessment, as well as surveys completed by school administrators, school counselors, and parents of the sampled students. The 2013 Update data collection was a brief, between-round status update consisting of a short survey to be completed by either the sample member or the sample member's parent. It occurred in summer and fall 2013 and captured information on sample members' high school completion status and employment or postsecondary education plans. Transcript data were also collected in 2013 and 2014 from all high schools where sample members were known to have attended.

The second follow-up survey of HSLS:09 was conducted between March 2016 and January 2017, about 3 years after most sample members had graduated from high school, and is highlighted in this First Look. Although most of the estimates in this First Look were generated from student survey data, the report does include estimates that incorporate data collected in prior rounds from parents and high school transcripts.

The number and timing of future follow-ups are yet to be determined; however, HSLS:09 is also collecting students' postsecondary financial aid records and transcripts in 2017. A First Look report and data from the collection of students' postsecondary financial aid records and transcripts are scheduled for release in 2019.

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Selected Findings

Among all fall 2009 ninth-graders by February 2016, …

- Ninety-two percent of all fall 2009 ninth-graders had earned a high school diploma by February 2016; of those who scored in the lowest fifth on the 2012 HSLS mathematics achievement test, however, 81 percent had earned a diploma, compared with 99 percent of those who scored in the highest fifth (table 1).
- Four percent of all fall 2009 ninth-graders had not earned any type of high school credential by February 2016. Among these, 67 percent were employed, 20 percent were unemployed (not working but looking for work), and 13 percent were not in the labor force (not working and not looking for work) (figure 1).
- Seventy-two percent of all fall 2009 ninth-graders had enrolled in postsecondary education between completing or leaving high school and February 2016 (table 2). When nonenrollees were asked to select one or more reasons why they had not enrolled, 9 percent chose academic reasons, 42 percent reported financial reasons, 43 percent indicated personal or family reasons, 32 percent chose work reasons, and 14 percent chose none of these.
- In February 2016, some 7 percent of all fall 2009 ninth-graders were enrolled in postsecondary education and employed full time, 26 percent were enrolled in postsecondary education and employed part time, 5 percent were enrolled in postsecondary education and unemployed, and 13 percent were enrolled in postsecondary education but not in the labor force (table 3). Another 25 percent were not enrolled in postsecondary education but were employed full time, 11 percent were not enrolled in postsecondary education but were employed part time, 8 percent were not enrolled in postsecondary education and unemployed, and 6 percent were not enrolled in postsecondary education and not in the labor force.

Among fall 2009 ninth-graders who had not enrolled in postsecondary education after high school by February 2016, …

- The median number of hours worked per week by fall 2009 ninth-graders who had not enrolled in postsecondary education after high school but were employed in February 2016 was 40 (table 4). When asked whether their current job was related to the job they expected to have at age 30, about one-quarter (23 percent) felt that their job was closely related, 8 percent felt that their job was somewhat related, and 25 percent felt that their job was not at all related to the job they expected to have at age 30. The remaining 43 percent did not know or did not plan to work at age 30.
- Thirty-nine percent of fall 2009 ninth-graders who had not enrolled in postsecondary education after high school but were employed in February 2016 had an income of $10,000 or less in 2015 (table 4).
- Fifty-two percent of fall 2009 ninth-graders who had not enrolled in postsecondary education after high school had been unemployed for at least 1 month between leaving high school and February 2016 (table 5). Among these, the median length of their longest unemployment spell was 5 months, and the median number of unemployment spells they experienced was two.

- During 2015, three-fifths of fall 2009 ninth-graders who had not enrolled in postsecondary education after high school had worried about having enough money for regular expenses like food, clothing, housing, and transportation (table 6).
- Twenty-six percent of fall 2009 ninth-graders who had not enrolled in postsecondary education after high school regularly received help from parents for rent, room and board, or mortgage payments in 2015, and 26 percent regularly received help from parents for health care costs in 2015 (table 7). Nineteen percent regularly received help from parents with monthly bills, utilities, car payments, or credit card bills.

Among fall 2009 ninth-graders who had enrolled in postsecondary education after high school by February 2016, …

- Eighty-two percent of fall 2009 ninth-graders who had enrolled in postsecondary education between high school and February 2016 enrolled within 4 months of leaving high school (table 8). Among those who enrolled, Asians had enrolled within 4 months at a higher rate than Blacks and Hispanics had (91 percent compared with 78 percent and 76 percent, respectively).
- Thirty-six percent of fall 2009 ninth-graders who had enrolled in postsecondary education after high school first enrolled at a public 2-year college, 41 percent at a public 4-year college, and 16 percent at a private nonprofit 4-year college (table 9). The remainder (7 percent) attended a for-profit or other type of institution.
- Fall 2009 ninth-graders who had enrolled in a postsecondary degree or certificate program after high school pursued a variety of fields of study. For example, when asked what fields they studied in the postsecondary education program in which they had most recently enrolled, 17 percent first listed a health field, 14 percent first listed business, and 20 percent first listed any of a number of other applied fields (e.g., personal and consumer services; manufacturing, construction, repair, and transportation; military technology and protective services, architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations) (table 10).
- Among fall 2009 ninth-graders who had enrolled in postsecondary education after high school, 5 percent had earned an undergraduate certificate and 5 percent had earned an associate's degree as their highest credential attained at the first institution in which they enrolled as of February 2016 (table 11). Regardless of institution (i.e., first or other), 6 percent had earned an undergraduate certificate and 6 percent had earned an associate's degree as their highest credential (table 12).
- Twenty-two percent of fall 2009 ninth-graders who had enrolled in postsecondary education after high school had not attained a postsecondary credential and were not enrolled as of February 2016 (table 13). When asked to select one or more reasons for leaving without earning a credential, 24 percent chose academic reasons, 40 percent picked financial reasons, 48 percent selected personal or family reasons, 22 percent chose work reasons, and 9 percent chose none of these.

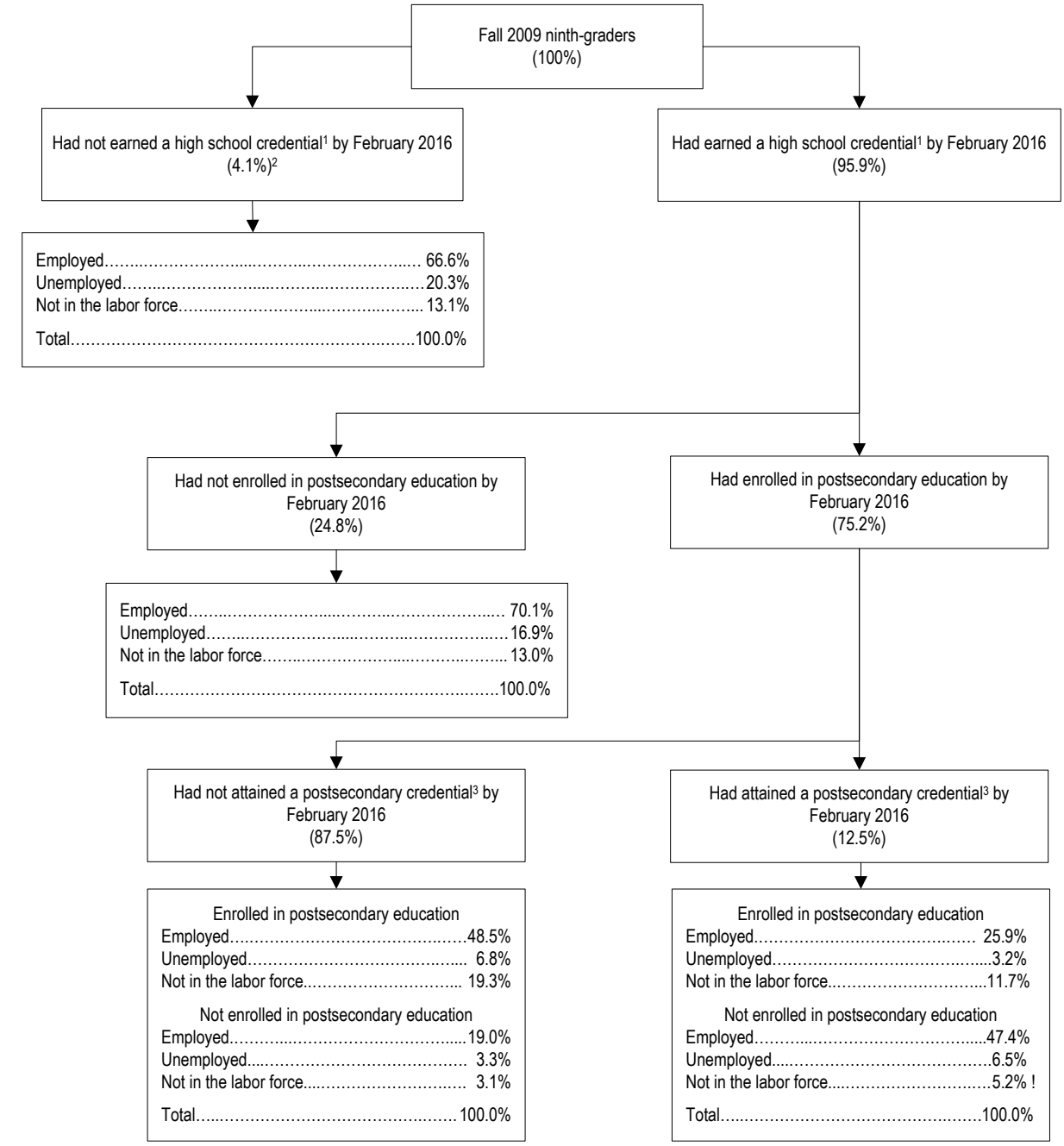
Figure and Tables

Table 1. Percentage distribution of fall 2009 ninth-graders' high school completion status as of February 2016, by student and high school characteristics: 2016

Characteristic	High school diploma	High school equivalency[1]	No high school diploma or equivalency
Total	**91.7**	**4.1**	**4.1**
Sex			
Female	93.1	3.7	3.2
Male	90.4	4.5	5.1
Race/ethnicity[2]			
White	93.3	3.6	3.0
Black	88.0	5.7	6.3
Hispanic	90.0	4.2	5.8
Asian	97.7	‡	‡
Other or Two or more races	90.2	5.0	4.7
Highest education attained by either parent			
High school credential or lower[3]	88.2	5.6	6.2
Certificate or associate's degree	91.7	4.2	4.2
Bachelor's degree or higher	95.9	2.4	1.8
Mathematics achievement quintile			
Lowest fifth	81.4	7.4	11.2
Middle three-fifths	92.2	4.4	3.4
Highest fifth	99.4	0.5	‡
Cumulative high school grade point average			
Less than 2.50	81.8	8.6	9.5
2.50–2.99	97.6	1.2 !	1.2
3.00–3.49	99.0	0.8 !	‡
3.50 or higher	99.6	0.4 !	‡
Control of high schools attended			
Only public	91.1	4.4	4.5
Only private	99.5	‡	‡
Both public and private	96.0	2.6 !	1.5 !

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Includes certificates of attendance or completion.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Figure 1. Percentage distribution of fall 2009 ninth-graders' postsecondary enrollment and labor force participation status in February 2016, by high school completion, postsecondary enrollment, and postsecondary attainment status: 2016



! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
[1] Includes high school diploma, equivalency, and certificate of attendance or completion.
[2] About 6.8 percent of those who had not earned a high school credential by February 2016 had enrolled in postsecondary education by February 2016 after leaving high school.
[3] Includes certificates, associate's degrees, and bachelor's degrees.
NOTE: Enrollment in postsecondary education refers to postsecondary enrollment that occurred after the student left high school with or without a credential and by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 2. Percentage distribution of fall 2009 ninth-graders' enrollment in postsecondary education as of February 2016, and among those who had not enrolled, percentage reporting various reasons for not enrolling, by student and high school characteristics: 2016

Characteristic	Had enrolled in postsecondary education		Among those who had not enrolled in postsecondary education, reasons for not enrolling[1]				
	Yes	No	Academic	Financial	Personal	Work-related	None of these
Total	**72.4**	**27.6**	**9.1**	**42.4**	**42.6**	**31.9**	**13.5**
Sex							
Female	76.8	23.2	7.6	43.3	48.5	22.1	15.3
Male	68.0	32.0	10.1	41.7	38.4	39.0	12.3
Race/ethnicity[2]							
White	75.7	24.3	8.1	42.7	37.4	36.6	13.9
Black	64.7	35.3	12.0	36.4	44.3	25.6	14.8
Hispanic	68.0	32.0	9.5	46.8	49.2	26.9	10.7
Asian	88.2	11.8	7.8 !	33.1	31.9	21.9 !	31.4 !
Other or Two or more races	69.4	30.6	7.4 !	41.1	48.6	35.6	14.1
Highest education attained by either parent							
High school credential or lower[3]	60.5	39.5	8.7	43.4	44.3	30.7	13.3
Certificate or associate's degree	72.0	28.0	7.8	43.7	42.1	31.9	13.2
Bachelor's degree or higher	86.5	13.5	11.7	37.3	37.6	36.0	14.6
Mathematics achievement quintile							
Lowest fifth	45.1	54.9	11.2	37.1	43.0	26.9	16.6
Middle three-fifths	73.1	26.9	7.9	45.9	42.5	34.4	11.6
Highest fifth	93.8	6.2	5.6 !	42.5	40.8	41.9	13.3
Cumulative high school grade point average							
Less than 2.50	49.7	50.3	9.7	43.0	44.4	32.4	12.6
2.50–2.99	76.3	23.7	7.1	44.1	38.6	32.3	15.7
3.00–3.49	90.1	9.9	8.5 !	41.5	34.1	28.7	15.8
3.50 or higher	96.7	3.3	‡	34.7	25.8	42.4	25.9
Control of high schools attended							
Only public	70.9	29.1	9.2	42.9	42.3	32.2	13.5
Only private	95.8	4.2	9.6 !	30.5	32.5	23.8	30.1
Both public and private	71.4	28.6	‡	‡	61.5	‡	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Respondents were able to select more than one reason for not having enrolled in postsecondary education.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Enrollment in postsecondary education refers to postsecondary enrollment that occurred after the student left high school with or without a credential and by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 3. Percentage distribution of fall 2009 ninth-graders' postsecondary enrollment and labor force participation status in February 2016, by student and high school characteristics: 2016

	Enrolled in postsecondary education					Not enrolled in postsecondary education				
Characteristic	Total	Employed full time	Employed part time	Unemployed	Not in labor force	Total	Employed full time	Employed part time	Unemployed	Not in labor force
Total	**51.0**	**6.9**	**26.2**	**4.6**	**13.2**	**49.0**	**24.9**	**10.6**	**7.5**	**6.0**
Sex										
Female	55.0	6.7	31.6	4.2	12.6	45.0	20.2	11.4	7.5	5.9
Male	46.9	7.1	20.8	5.1	13.9	53.1	29.6	9.8	7.6	6.1
Race/ethnicity[1]										
White	56.2	6.8	30.1	4.2	15.0	43.8	24.3	9.4	5.1	5.1
Black	42.0	6.0	23.7	3.7	8.5	58.0	24.1	14.5	14.3	5.2
Hispanic	43.3	7.9	19.7	4.9	10.8	56.7	28.0	10.7	9.3	8.7
Asian	75.4	6.3	32.2	9.8	27.1	24.6	8.4	5.9 !	4.3 !	6.1
Other or Two or more races	43.7	7.0	20.6	5.7 !	10.4	56.3	28.7	13.2	8.4	6.1
Highest education attained by either parent										
High school credential or lower[2]	36.5	7.0	17.5	3.8	8.3	63.5	32.1	11.8	11.4	8.2
Certificate or associate's degree	47.0	6.9	25.7	4.5	9.9	53.0	27.6	12.8	7.2	5.4
Bachelor's degree or higher	70.1	6.9	36.6	5.7	21.0	29.9	15.0	7.8	3.3	3.7
Mathematics achievement quintile										
Lowest fifth	22.4	4.7	9.4	2.6	5.7	77.6	36.1	16.5	15.5	9.6
Middle three-fifths	49.5	8.0	25.7	4.5	11.3	50.5	26.7	10.8	6.9	6.1
Highest fifth	79.3	6.0	41.6	6.7	25.0	20.7	10.6	5.1	2.3	2.7
Cumulative high school grade point average										
Less than 2.50	23.5	5.2	10.0	3.6	4.7	76.5	37.0	16.1	14.0	9.5
2.50–2.99	49.9	8.5	25.1	3.8	12.5	50.1	28.4	10.6	5.4	5.7
3.00–3.49	71.3	9.7	36.8	5.3	19.5	28.7	15.6	7.6	2.7	2.9
3.50 or higher	87.7	5.2	50.6	6.4	25.5	12.3	6.0	3.2	1.2 !	1.9
Control of high schools attended										
Only public	48.7	7.0	25.2	4.5	12.1	51.3	26.3	10.9	7.7	6.2
Only private	82.3	6.0	42.4	7.4	26.6	17.7	7.3	5.9	1.8	2.7
Both public and private	57.2	6.4 !	22.9	3.9 !	24.0	42.8	13.7	8.8 !	15.5 !	4.7 !

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
[1] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[2] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Enrollment in postsecondary education refers to postsecondary enrollment that occurred after the student left high school with or without a credential and by February 2016. Respondents working an average of 35 hours or more per week were considered to be working full time. Respondents working an average of less than 35 hours per week were considered to be working part time. Respondents who were not working but were actively looking for work were considered to be unemployed. Respondents who were not working and were not actively looking for work were considered to be out of the labor force. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 4. Among fall 2009 ninth-graders who never enrolled in postsecondary education but were employed in February 2016, median hours worked, percentage distribution of self-assessment of relationship between February job and job they expected to have at age 30, and percentage whose 2015 income was $10,000 or less, by student and high school characteristics: 2016

Characteristic	Median hours worked	Relationship between job and job expected to have at age 30				Income was $10,000 or less in 2015[1]
		Closely related	Somewhat related	Not at all related	Don't know or don't plan to work	
Total	**40**	**23.4**	**8.0**	**25.5**	**43.0**	**38.6**
Sex						
Female	38	18.3	6.6	27.9	47.3	46.4
Male	40	26.7	9.0	24.0	40.4	33.7
Race/ethnicity[2]						
White	40	25.8	7.3	21.7	45.2	32.0
Black	40	20.0 !	7.9 !	36.4	35.7	67.1
Hispanic	40	21.6	6.9 !	26.5	44.9	33.9
Asian	40	‡	‡	24.4 !	45.7 !	38.3 !
Other or Two or more races	40	22.0	14.0 !	25.0	39.1	37.8
Highest education attained by either parent						
High school credential or lower[3]	40	26.5	6.4	24.7	42.5	37.5
Certificate or associate's degree	40	18.2	13.1	28.3	40.4	41.2
Bachelor's degree or higher	40	20.6	7.0	24.6	47.8	38.9
Mathematics achievement quintile						
Lowest fifth	40	28.8	8.8	24.6	37.9	46.1
Middle three-fifths	40	20.1	7.5	26.4	46.0	35.7
Highest fifth	40	26.6	9.5 !	20.6 !	43.4	26.1
Cumulative high school grade point average						
Less than 2.50	40	23.9	7.9	25.8	42.4	40.1
2.50–2.99	40	19.6	8.0	24.2	48.1	34.2
3.00–3.49	35	20.2	8.7	30.3	40.8	40.5
3.50 or higher	37	32.4	15.2 !	16.8 !	35.6 !	35.8
Control of high schools attended						
Only public	40	23.5	7.9	25.5	43.1	38.4
Only private	32	27.3	20.9 !	12.4 !	39.4	40.7
Both public and private	39	‡	‡	31.5 !	42.5	53.1

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Includes cases with no income.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have never enrolled in postsecondary education if, after leaving high school with or without a credential, they had no postsecondary enrollment by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 5. Among fall 2009 ninth-graders who never enrolled in postsecondary education, percentage who had been unemployed for at least 1 month between leaving high school and February 2016, and among those, percentage who had received unemployment compensation, median number of months of longest unemployment spell, and median number of unemployment spells of 1 month or more, by student and high school characteristics: 2016

Characteristic	Percentage ever unemployed for at least 1 month	Ever unemployed for at least 1 month: Percentage who had received unemployment compensation	Ever unemployed for at least 1 month: Median number of months of longest unemployment spell	Ever unemployed for at least 1 month: Median number of unemployment spells of 1 month or more
Total	**51.6**	**6.0**	**5**	**2**
Sex				
Female	57.0	6.0 !	5	2
Male	47.6	6.0	4	2
Race/ethnicity[1]				
White	47.5	8.0	4	2
Black	61.0	3.6 !	5	2
Hispanic	52.2	‡	5	2
Asian	38.2	‡	‡	‡
Other or Two or more races	53.9	‡	5	2
Highest education attained by either parent				
High school credential or lower[2]	55.0	6.0	5	2
Certificate or associate's degree	46.3	7.9 !	4	2
Bachelor's degree or higher	46.4	3.6 !	3	2
Mathematics achievement quintile				
Lowest fifth	57.8	6.3 !	5	2
Middle three-fifths	48.5	6.0	5	2
Highest fifth	42.7	‡	4	2 !
Cumulative high school grade point average				
Less than 2.50	55.0	6.6	4	2
2.50–2.99	44.2	4.8 !	6	2
3.00–3.49	37.3	‡	5	2
3.50 or higher	41.7	‡	‡	‡
Control of high schools attended				
Only public	51.2	6.2	4	2
Only private	39.6	‡	4	2
Both public and private	71.4	‡	6	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[2] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have never enrolled in postsecondary education if, after leaving high school with or without a credential, they had no postsecondary enrollment by February 2016.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 6. Among fall 2009 ninth-graders who never enrolled in postsecondary education, percentage who reported experiencing various financial circumstances during 2015, by student and high school characteristics: 2016

Characteristic	Worried about having enough money for regular expenses[1]	Owed an amount on credit card bill that was carried over from a prior month	Increased borrowing or use of credit cards to pay expenses	Increased number of hours worked in order to pay expenses
Total	**60.1**	**20.0**	**14.7**	**47.1**
Sex				
Female	63.4	22.5	16.0	49.3
Male	57.6	18.2	13.7	45.4
Race/ethnicity[2]				
White	61.6	18.5	12.0	47.2
Black	54.9	15.9	15.9	45.6
Hispanic	57.2	21.5	17.5	44.5
Asian	53.0	‡	‡	29.7
Other or Two or more races	70.2	29.6	18.1 !	57.3
Highest education attained by either parent				
High school credential or lower[3]	58.6	17.9	13.9	44.6
Certificate or associate's degree	64.7	25.0	16.2	52.4
Bachelor's degree or higher	59.2	21.1	15.7	48.8
Mathematics achievement quintile				
Lowest fifth	59.7	16.6	14.7	44.0
Middle three-fifths	60.6	22.6	15.3	49.6
Highest fifth	56.5	16.9	8.6 !	42.6
Cumulative high school grade point average				
Less than 2.50	62.7	19.1	14.1	47.5
2.50–2.99	54.2	20.7	16.2	45.6
3.00–3.49	54.2	21.4	14.3	46.0
3.50 or higher	54.6	22.7 !	‡	44.8
Control of high schools attended				
Only public	60.7	20.2	14.7	47.7
Only private	42.6	25.9	10.1 !	35.2
Both public and private	38.9 !	‡	‡	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Examples of regular expenses provided included food, clothing, housing, and transportation.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have never enrolled in postsecondary education if, after leaving high school with or without a credential, they had no postsecondary enrollment by February 2016.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 7. Percentage of fall 2009 ninth-graders who never enrolled in postsecondary education reporting that their parents regularly helped cover various needs in 2015, by student and high school characteristics: 2016

Characteristic	In 2015, parents regularly helped cover		
	Rent, room and board, or mortgage	Monthly bills, utilities, car payments, or credit card bills	Health care costs
Total	**26.1**	**18.7**	**25.6**
Sex			
Female	24.5	16.6	22.6
Male	27.3	20.3	27.9
Race/ethnicity[1]			
White	22.8	16.3	25.6
Black	35.8	25.3	32.9
Hispanic	25.7	17.7	21.8
Asian	39.5 !	36.0 !	37.0
Other or Two or more races	24.1	18.2	22.1
Highest education attained by either parent			
High school credential or lower[2]	25.0	17.2	23.0
Certificate or associate's degree	22.1	17.8	26.8
Bachelor's degree or higher	34.6	24.9	32.9
Mathematics achievement quintile			
Lowest fifth	25.7	21.7	28.4
Middle three-fifths	25.8	16.8	24.1
Highest fifth	32.7	17.8	23.5
Cumulative high school grade point average			
Less than 2.50	25.7	17.9	26.2
2.50–2.99	23.8	19.1	23.4
3.00–3.49	33.2	19.3	27.3
3.50 or higher	35.9	30.6	39.0
Control of high schools attended			
Only public	26.0	18.5	25.6
Only private	54.7	37.6	54.1
Both public and private	‡	‡	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[2] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have never enrolled in postsecondary education if, after leaving high school with or without a credential, they had no postsecondary enrollment by February 2016.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 8. Percentage of fall 2009 ninth-graders who had enrolled in postsecondary education, and among them, percentage distribution of the number of months between completing or leaving high school and first entering postsecondary education, by student and high school characteristics: 2016

Characteristic	Ever enrolled in postsecondary education	Percentage distribution of the number of months between leaving high school[1] and first entering postsecondary education				
		0–4 months	5–8 months	9–12 months	13–24 months	25 months or more
Total	**72.4**	**82.5**	**5.0**	**1.5**	**8.1**	**2.9**
Sex						
Female	76.8	84.4	5.1	1.1	7.2	2.2
Male	68.0	80.3	4.8	2.0	9.2	3.6
Race/ethnicity[2]						
White	75.7	85.9	3.9	1.2	6.3	2.8
Black	64.7	77.9	7.3	2.5 !	10.2	2.1 !
Hispanic	68.0	76.1	7.0	1.7 !	12.3	2.9
Asian	88.2	90.7	2.4 !	‡	3.7 !	2.5 !
Other or Two or more races	69.4	78.5	5.2	2.4 !	9.3	4.6
Highest education attained by either parent						
High school credential or lower[3]	60.5	76.3	6.1	2.3	11.3	4.1
Certificate or associate's degree	72.0	79.5	6.1	1.2 !	9.9	3.3
Bachelor's degree or higher	86.5	89.0	3.5	1.1	4.8	1.6
Mathematics achievement quintile						
Lowest fifth	45.1	66.9	8.6	4.8	15.3	4.4
Middle three-fifths	73.1	80.0	5.9	1.4	9.3	3.3
Highest fifth	93.8	93.8	1.5	0.6 !	2.9	1.2
Cumulative high school grade point average						
Less than 2.50	49.7	62.6	9.2	3.9	18.1	6.2
2.50–2.99	76.3	81.3	6.7	1.5	7.9	2.6
3.00–3.49	90.1	91.1	2.6	0.3 !	4.4	1.5
3.50 or higher	96.7	96.0	1.4	‡	1.5	0.9 !
Control of high schools attended						
Only public	70.9	81.3	5.3	1.7	8.7	3.0
Only private	95.8	94.2	1.4 !	‡	3.2	‡
Both public and private	71.4	85.2	‡	‡	4.8 !	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Among those who had a high school diploma, high school departure date is the month and year this credential was awarded. Among those who had no high school diploma but had a high school equivalency or had a certificate of attendance or completion, high school departure date is the month and year this credential was awarded. Among those who did not have any of these credentials, high school departure is the month and year last attended high school.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have enrolled in postsecondary education if, after leaving high school with or without a credential, they had enrolled in postsecondary education by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 9. Among fall 2009 ninth-graders who had enrolled in postsecondary education, percentage distribution of control and level of institution in which they first enrolled after high school, by student and high school characteristics: 2016

Characteristic	Public 2-year	Public 4-year	Private nonprofit 4-year	For-profit 4-year	For-profit 2-year	For-profit less-than-2-year	Other[1]
Total	**35.7**	**40.6**	**16.4**	**1.8**	**1.9**	**1.6**	**2.0**
Sex							
Female	34.0	41.3	16.9	2.2	1.9	1.9	1.9
Male	37.7	39.7	15.9	1.4	1.9	1.3 !	2.1
Race/ethnicity[2]							
White	30.5	44.7	19.4	1.3	1.4	1.0	1.6
Black	35.3	42.1	14.0	2.7	1.9 !	1.4 !	2.5 !
Hispanic	50.7	26.9	12.0	2.5	3.1	3.3	1.4 !
Asian	30.7	51.3	16.7	‡	‡	0.5 !	‡
Other or Two or more races	35.8	39.8	11.7	2.7 !	2.4 !	1.8 !	5.9 !
Highest education attained by either parent							
High school credential or lower[3]	46.9	30.7	10.6	2.7	3.1	3.3	2.6
Certificate or associate's degree	41.2	37.6	13.7	1.3	1.9	1.2 !	3.2 !
Bachelor's degree or higher	24.0	50.0	22.4	1.4	0.9 !	0.4	0.9
Mathematics achievement quintile							
Lowest fifth	55.0	20.4	7.6	2.3 !	4.9	3.9	5.9
Middle three-fifths	41.2	36.9	13.7	2.2	2.1	1.8	2.0
Highest fifth	16.4	56.5	25.6	0.7 !	‡	‡	0.4 !
Cumulative high school grade point average							
Less than 2.50	60.9	15.7	6.3	3.0	4.9	3.9	5.3
2.50–2.99	41.2	38.9	12.0	2.6	1.7	1.9	1.7
3.00–3.49	27.5	50.2	19.7	1.1 !	‡	‡	0.6 !
3.50 or higher	12.9	57.9	27.9	0.6 !	‡	‡	0.4 !
Control of high schools attended							
Only public	38.2	40.3	13.8	1.9	2.0	1.7	2.1
Only private	12.9	45.5	39.3	0.9 !	‡	‡	‡
Both public and private	19.1	34.6	40.2	‡	‡	‡	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year colleges.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have enrolled in postsecondary education if, after leaving high school with or without a credential, they had enrolled in postsecondary education by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 10. Among fall 2009 ninth-graders who had enrolled in an undergraduate degree or certificate program between completing or leaving high school and February 2016, percentage distribution of major field of study in their most recent undergraduate degree or certificate program, by student and high school characteristics: 2016

Characteristic	Don't know or undecided	Computer and information sciences	Engineering and engineering technology	Biological and physical science, science technology, mathematics, and agriculture	Health fields	Business	Education	Social sciences	Humanities	Other applied[1]	Other[2]
Total	**5.9**	**4.0**	**7.6**	**9.8**	**16.7**	**13.8**	**5.8**	**9.1**	**5.4**	**19.6**	**2.3**
Sex											
Female	5.1	1.4	2.6	10.1	25.9	11.0	8.1	10.1	5.6	17.5	2.6
Male	6.9	7.0	13.1	9.5	6.4	16.9	3.2	8.0	5.2	21.8	2.0
Race/ethnicity[3]											
White	5.1	4.2	8.0	11.2	14.7	14.5	7.2	7.7	6.3	19.1	2.0
Black	7.0	3.9	3.7	6.9	20.5	15.7	3.5 !	11.5	3.1	21.5	2.9 !
Hispanic	6.9	3.1	9.6	6.1	19.6	10.4	5.3	12.0	4.6	19.2	3.2 !
Asian	7.8 !	7.3	9.6	18.0	10.6	16.3	1.6 !	9.6	6.2	11.9	‡
Other or Two or more races	7.0	3.3	4.6	9.6	20.4	12.8	3.2	7.5	4.9	24.7	2.1 !
Highest education attained by either parent											
High school credential or lower[4]	8.2	3.1	6.7	6.8	21.4	11.3	4.8	8.8	4.0	21.4	3.4
Certificate or associate's degree	6.6	3.8	6.5	8.4	17.9	12.2	6.5	8.9	4.0	23.7	1.6
Bachelor's degree or higher	3.9	4.8	8.8	12.8	12.5	16.4	6.2	9.4	7.2	16.1	1.9
Mathematics achievement quintile											
Lowest fifth	9.5	2.4	‡	4.4	23.8	11.0	5.9 !	4.1	3.0	29.1	3.1 !
Middle three-fifths	6.8	3.6	5.1	7.4	18.9	13.8	6.3	9.4	4.9	21.4	2.4
Highest fifth	2.8	5.5	14.1	16.8	9.7	14.5	4.7	10.4	7.4	12.2	1.9

See notes at end of table.

Table 10. Among fall 2009 ninth-graders who had enrolled in an undergraduate degree or certificate program between completing or leaving high school and February 2016, percentage distribution of major field of study in their most recent undergraduate degree or certificate program, by student and high school characteristics: 2016—Continued

Characteristic	Don't know or undecided	Computer and information sciences	Engineering and engineering technology	Biological and physical science, science technology, mathematics, and agriculture	Health fields	Business	Education	Social sciences	Humanities	Other applied[1]	Other[2]
Cumulative high school grade point average											
Less than 2.50	11.7	4.4	5.9	3.3	20.0	11.1	5.3	4.9	3.6	26.4	3.3
2.50–2.99	7.1	3.7	6.0	7.6	16.7	13.6	5.7	9.5	5.1	22.4	2.6 !
3.00–3.49	3.5	3.9	7.4	10.4	14.8	15.9	5.5	11.8	6.1	18.4	2.3
3.50 or higher	1.5	3.8	10.9	17.9	15.5	13.9	7.0	10.1	6.8	11.6	1.1
Control of high schools attended											
Only public	6.2	4.0	7.7	9.7	17.2	13.2	6.0	8.4	5.0	20.1	2.5
Only private	3.0	4.1	7.1	10.6	12.6	20.0	4.3	13.1	9.3	15.2	0.8 !
Both public and private	5.7 !	4.1 !	‡	9.7 !	11.8	14.2 !	‡	24.4 !	7.8 !	13.8	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Includes personal and consumer services; manufacturing, construction, repair, transportation; military technology and protective services; architecture; communications; public administration and human services; design and applied arts; law and legal studies; library sciences; and theology and religious vocations.
[2] Includes basic skills and citizenship activities; leisure and recreational activities; personal awareness and self-improvement; high school/secondary diplomas and certificate programs; and interpersonal and social skills.
[3] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[4] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: In the case of a double major, the major field is the major field the respondent reported first. Respondents were considered to have enrolled in an undergraduate degree or certificate program if they did so after leaving high school with or without a credential and by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 11. Among fall 2009 ninth-graders who ever enrolled in postsecondary education, percentage distribution of attainment and retention at first institution as of February 2016, by student and high school characteristics: 2016

Characteristic	Highest credential attained at first institution			If no credential attained at first institution, retention status at first institution		
	Undergraduate certificate	Associate's degree	Bachelor's degree	Enrolled at first institution	Enrolled at a different institution	Not enrolled at any institution[1]
Total	**4.6**	**5.0**	**0.4**	**51.7**	**14.5**	**23.6**
Sex						
Female	4.6	4.8	0.5 !	52.3	14.9	22.9
Male	4.7	5.3	0.3 !	51.1	14.1	24.5
Race/ethnicity[2]						
White	3.9	5.9	0.5	54.2	15.5	19.9
Black	4.3	3.3	‡	46.4	15.9	30.1
Hispanic	6.8	4.1	‡	48.0	11.4	29.3
Asian	2.4 !	3.2 !	‡	65.9	14.8	13.6
Other or Two or more races	5.5	5.2	‡	45.4	14.0	29.4
Highest education attained by either parent						
High school credential or lower[3]	7.6	4.6	0.4 !	43.9	12.4	31.2
Certificate or associate's degree	4.1	6.0	0.5 !	46.6	14.6	28.2
Bachelor's degree or higher	2.5	4.9	0.5 !	60.5	16.3	15.2
Mathematics achievement quintile						
Lowest fifth	10.8	3.1	‡	31.5	13.9	40.3
Middle three-fifths	5.2	5.7	0.3 !	48.4	14.8	25.6
Highest fifth	1.1	4.3	0.7 !	66.7	14.3	13.0
Cumulative high school grade point average						
Less than 2.50	10.5	3.0	‡	31.4	12.0	43.1
2.50–2.99	4.5	5.2	0.4 !	44.7	17.8	27.5
3.00–3.49	2.0	6.1	0.5 !	57.9	16.7	16.7
3.50 or higher	1.5	6.2	0.7 !	72.6	12.1	6.9
Control of high schools attended						
Only public	5.0	5.3	0.5	50.0	14.4	24.9
Only private	‡	2.9	‡	68.2	15.4	11.8
Both public and private	‡	‡	‡	59.4	18.3	16.5

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Includes respondents who attained a credential at another institution but were no longer enrolled.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have enrolled in postsecondary education if, after leaving high school with or without a credential, they had enrolled in postsecondary education by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 12. Among fall 2009 ninth-graders who ever enrolled in postsecondary education, percentage distribution of attainment and persistence at any institution as of February 2016, by student and high school characteristics: 2016

Characteristic	Highest credential attained at any institution			If no credential attained, persistence status at any institution		
	Undergraduate certificate	Associate's degree	Bachelor's degree	Enrolled at 4-year institution	Enrolled at less-than-4-year institution	Not enrolled
Total	**6.4**	**5.7**	**0.5**	**47.2**	**18.0**	**22.3**
Sex						
Female	6.8	5.4	0.6 !	49.9	16.3	21.0
Male	5.9	6.1	0.4 !	44.2	19.8	23.7
Race/ethnicity[1]						
White	5.6	6.7	0.6	54.6	13.9	18.7
Black	5.8	3.9	‡	43.5	18.1	28.7
Hispanic	9.3	4.8	0.5 !	30.3	27.9	27.2
Asian	2.6 !	3.8 !	‡	61.8	18.2	13.6
Other or Two or more races	7.1	5.6	‡	38.9	19.7	28.3
Highest education attained by either parent						
High school credential or lower[2]	9.1	5.5	0.4 !	32.0	23.2	29.8
Certificate or associate's degree	6.8	6.5	0.5 !	38.8	21.2	26.1
Bachelor's degree or higher	3.9	5.5	0.6 !	63.6	12.2	14.3
Mathematics achievement quintile						
Lowest fifth	14.6	3.7	‡	19.5	24.7	37.1
Middle three-fifths	6.8	6.6	0.4 !	40.8	21.4	24.2
Highest fifth	2.2	4.7	0.8 !	71.8	8.0	12.6
Cumulative high school grade point average						
Less than 2.50	12.8	3.4	‡	14.6	28.4	40.8
2.50–2.99	6.5	6.3	0.4 !	39.2	21.6	26.1
3.00–3.49	3.9	6.8	0.6 !	56.7	16.7	15.4
3.50 or higher	2.2	6.7	0.8 !	79.2	4.5	6.5
Control of high schools attended						
Only public	6.8	6.0	0.5	44.2	19.1	23.4
Only private	2.7 !	3.3	‡	75.9	6.8	11.0
Both public and private	‡	‡	‡	64.7	12.8 !	15.7

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[2] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have enrolled in postsecondary education if, after leaving high school with or without a credential, they had enrolled in postsecondary education by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table 13. Among fall 2009 ninth-graders who ever enrolled in postsecondary education, percentage who had not attained a postsecondary credential and were no longer enrolled as of February 2016, and among these, percentage reporting various reasons for not being enrolled, by student and high school characteristics: 2016

Characteristic	Did not attain a credential and not enrolled	Among those not enrolled, reasons for not being enrolled[1]				
		Academic	Financial	Personal or family	Work-related	None of these
Total	**22.3**	**23.7**	**40.1**	**48.3**	**21.9**	**8.7**
Sex						
Female	21.0	25.8	39.1	52.0	16.1	9.0
Male	23.7	21.6	41.2	44.6	27.8	8.3
Race/ethnicity[2]						
White	18.7	23.0	34.8	47.8	25.3	11.5
Black	28.7	24.4	45.7	56.4	16.2	5.7 !
Hispanic	27.2	24.3	45.6	46.3	18.4	4.9 !
Asian	13.6	14.1 !	23.7 !	56.2	30.5 !	‡
Other or Two or more races	28.3	26.4	45.8	41.5	21.8	10.4
Highest education attained by either parent						
High school credential or lower[3]	29.8	22.0	40.4	48.4	20.6	8.2
Certificate or associate's degree	26.1	24.9	46.6	47.0	19.8	7.6
Bachelor's degree or higher	14.3	25.6	34.0	49.3	26.0	10.4
Mathematics achievement quintile						
Lowest fifth	37.1	19.3	40.1	46.5	19.6	11.7
Middle three-fifths	24.2	23.4	40.9	48.4	22.0	6.7
Highest fifth	12.6	30.3	37.1	50.2	24.3	13.4
Cumulative high school grade point average						
Less than 2.50	40.8	24.5	40.6	46.6	21.2	8.2
2.50–2.99	26.1	24.5	44.4	46.4	24.5	8.8
3.00–3.49	15.4	22.6	36.2	58.3	17.8	6.9
3.50 or higher	6.5	14.8 !	32.5	43.6	25.6	16.5
Control of high schools attended						
Only public	23.4	24.1	40.6	48.4	22.3	8.3
Only private	11.0	15.2 !	36.0	45.8	11.5	19.1
Both public and private	15.7	‡	‡	50.5	‡	‡

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
‡ Reporting standards are not met either because the standard error was greater than 50 percent or there were too few cases for a reliable estimate.
[1] Respondents were able to select more than one reason for having left postsecondary education.
[2] Black includes African American, Hispanic includes Latino, and Other or Two or more races includes American Indian or Alaska Native, Pacific Islander or Native Hawaiian, and respondents having origins in more than one race. Race categories exclude Hispanic origin unless specified.
[3] Includes high school diplomas, high school equivalencies, and certificates of attendance or completion.
NOTE: Respondents were considered to have enrolled in postsecondary education if, after leaving high school with or without a credential, they had enrolled in postsecondary education by February 2016.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

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Appendix A—Estimates and Standard Errors for Figure 1 and Standard Errors for Tables 1–13

Table A-1. Standard errors for table 1: Percentage distribution of fall 2009 ninth-graders' high school completion status as of February 2016, by student and high school characteristics: 2016

Characteristic	High school diploma	High school equivalency	No high school diploma or equivalency
Total	**0.54**	**0.35**	**0.34**
Sex			
Female	0.62	0.43	0.40
Male	0.77	0.48	0.56
Race/ethnicity			
White	0.49	0.40	0.30
Black	1.76	1.13	1.41
Hispanic	1.05	0.75	0.75
Asian	0.97	†	†
Other or Two or more races	1.60	0.99	1.03
Highest education attained by either parent			
High school credential or lower	0.91	0.61	0.60
Certificate or associate's degree	0.99	0.59	0.72
Bachelor's degree or higher	0.51	0.37	0.31
Mathematics achievement quintile			
Lowest fifth	1.48	0.78	1.21
Middle three-fifths	0.65	0.46	0.40
Highest fifth	0.15	0.14	†
Cumulative high school grade point average			
Less than 2.50	1.20	0.82	0.84
2.50–2.99	0.51	0.39	0.31
3.00–3.49	0.31	0.29	†
3.50 or higher	0.18	0.17	†
Control of high schools attended			
Only public	0.58	0.38	0.37
Only private	0.26	†	†
Both public and private	1.32	1.14	0.59

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-2. Standard errors for table 2: Percentage distribution of fall 2009 ninth-graders' enrollment in postsecondary education as of February 2016, and among those who had not enrolled, percentage reporting various reasons for not enrolling, by student and high school characteristics: 2016

Characteristic	Had enrolled in postsecondary education		Among those who had not enrolled in postsecondary education, reasons for not enrolling				
	Yes	No	Academic	Financial	Personal	Work-related	None of these
Total	**1.03**	**1.03**	**0.87**	**1.53**	**1.75**	**1.52**	**0.98**
Sex							
Female	1.16	1.16	1.14	2.10	2.04	1.91	1.70
Male	1.29	1.29	1.30	2.22	2.42	2.11	1.18
Race/ethnicity							
White	0.87	0.87	0.78	1.87	1.88	1.64	1.25
Black	2.63	2.63	2.81	3.09	3.73	3.50	2.79
Hispanic	2.47	2.47	2.60	3.67	3.75	3.95	2.02
Asian	2.56	2.56	3.25	9.09	9.36	9.55	11.50
Other or Two or more races	2.70	2.70	2.34	4.60	6.41	5.16	3.97
Highest education attained by either parent							
High school credential or lower	1.53	1.53	1.04	2.16	2.55	2.20	1.40
Certificate or associate's degree	1.61	1.61	1.75	2.87	2.97	3.01	1.96
Bachelor's degree or higher	0.92	0.92	2.22	3.24	2.88	3.22	1.86
Mathematics achievement quintile							
Lowest fifth	2.47	2.47	1.52	2.61	2.99	2.52	1.90
Middle three-fifths	1.11	1.11	0.95	2.03	2.06	2.08	1.16
Highest fifth	0.72	0.72	2.02	6.09	6.85	6.29	3.88
Cumulative high school grade point average							
Less than 2.50	1.67	1.67	1.04	2.02	2.04	2.00	1.18
2.50–2.99	1.73	1.73	2.04	3.26	3.64	3.73	2.39
3.00–3.49	0.80	0.80	2.90	4.27	4.56	3.85	2.86
3.50 or higher	0.49	0.49	†	8.82	6.30	8.95	7.28
Control of high schools attended							
Only public	1.11	1.11	0.90	1.54	1.67	1.55	1.00
Only private	0.91	0.91	4.10	7.15	6.99	6.58	7.92
Both public and private	5.31	5.31	†	†	17.48	†	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-3. Standard errors for table 3: Percentage distribution of fall 2009 ninth-graders' postsecondary enrollment and labor force participation status in February 2016, by student and high school characteristics: 2016

	Enrolled in postsecondary education					Not enrolled in postsecondary education				
Characteristic	Total	Employed full time	Employed part time	Unemployed	Not in labor force	Total	Employed full time	Employed part time	Unemployed	Not in labor force
Total	**1.12**	**0.37**	**0.72**	**0.33**	**0.61**	**1.12**	**0.76**	**0.53**	**0.54**	**0.38**
Sex										
Female	1.41	0.54	1.03	0.48	0.72	1.41	0.93	0.75	0.78	0.45
Male	1.27	0.57	0.94	0.49	0.83	1.27	1.11	0.71	0.58	0.57
Race/ethnicity										
White	1.03	0.41	0.76	0.31	0.70	1.03	0.88	0.51	0.35	0.34
Black	2.99	0.97	2.31	0.74	1.47	2.99	1.99	1.87	2.06	0.94
Hispanic	2.31	1.30	1.80	1.04	1.29	2.31	1.79	1.31	1.44	1.28
Asian	3.57	1.76	3.36	1.91	2.63	3.57	1.88	1.95	1.66	1.69
Other or Two or more races	2.92	1.13	1.85	1.84	1.54	2.92	2.28	1.98	1.53	0.92
Highest education attained by either parent										
High school credential or lower	1.48	0.63	1.10	0.53	0.93	1.48	1.33	0.97	1.03	0.80
Certificate or associate's degree	1.76	0.74	1.46	0.79	1.12	1.76	1.60	1.07	0.86	0.70
Bachelor's degree or higher	1.21	0.65	1.07	0.46	0.97	1.21	0.77	0.64	0.40	0.38
Mathematics achievement quintile										
Lowest fifth	1.80	0.76	1.02	0.58	1.55	1.80	2.00	1.38	1.81	0.93
Middle three-fifths	1.12	0.57	0.89	0.53	0.57	1.12	0.93	0.63	0.52	0.51
Highest fifth	1.22	0.54	1.33	0.69	1.39	1.22	0.86	0.74	0.52	0.46
Cumulative high school grade point average										
Less than 2.50	1.31	0.50	1.00	0.61	0.60	1.31	1.23	1.02	1.04	0.84
2.50–2.99	1.95	1.13	1.34	0.72	1.06	1.95	1.32	0.96	0.75	0.83
3.00–3.49	1.59	0.94	1.46	0.60	1.31	1.59	1.29	0.73	0.57	0.43
3.50 or higher	1.21	0.65	1.49	0.68	1.21	1.21	0.69	0.67	0.55	0.38
Control of high schools attended										
Only public	1.21	0.40	0.78	0.37	0.68	1.21	0.84	0.55	0.56	0.41
Only private	1.95	0.97	1.61	0.64	1.75	1.95	1.16	1.04	0.52	0.52
Both public and private	4.20	2.09	5.43	1.74	5.45	4.20	3.65	3.79	6.78	1.68

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-4. Standard errors for table 4: Among fall 2009 ninth-graders who never enrolled in postsecondary education but were employed in February 2016, median hours worked, percentage distribution of self-assessment of relationship between February job and job they expected to have at age 30, and percentage whose 2015 income was $10,000 or less, by student and high school characteristics: 2016

Characteristic	Median hours worked	Relationship between job and job expected to have at age 30				Income was $10,000 or less in 2015
		Closely related	Somewhat related	Not at all related	Don't know or don't plan to work	
Total	**^**	**1.58**	**1.03**	**1.65**	**1.89**	**1.90**
Sex						
Female	2	2.43	1.20	2.44	2.99	2.81
Male	^	2.03	1.52	2.20	2.38	2.37
Race/ethnicity						
White	^	1.99	0.97	1.68	2.01	1.94
Black	2	6.52	2.82	6.19	5.86	6.27
Hispanic	^	3.53	2.44	4.28	4.83	4.08
Asian	9	†	†	8.11	14.96	11.97
Other or Two or more races	2	4.29	5.20	4.35	6.36	5.59
Highest education attained by either parent						
High school credential or lower	^	2.36	1.37	2.33	2.65	2.42
Certificate or associate's degree	#	2.30	2.18	2.89	3.45	3.87
Bachelor's degree or higher	^	2.73	1.62	3.19	3.60	3.67
Mathematics achievement quintile						
Lowest fifth	^	3.40	1.81	2.46	3.36	3.68
Middle three-fifths	^	1.83	1.30	2.11	2.51	2.29
Highest fifth	1	6.47	3.31	7.11	7.91	7.32
Cumulative high school grade point average						
Less than 2.50	^	1.88	1.44	2.15	2.18	2.53
2.50–2.99	^	3.09	1.83	2.79	3.96	3.43
3.00–3.49	3	5.15	2.61	5.59	5.85	5.62
3.50 or higher	4	8.67	5.94	6.78	11.30	10.59
Control of high schools attended						
Only public	^	1.61	1.03	1.66	1.93	1.92
Only private	6	6.23	7.39	5.97	7.85	8.51
Both public and private	5	†	†	11.68	12.12	13.48

† Not applicable.
# Rounds to zero.
^ Standard error of quantile, as estimated by Woodruff method, is zero. Use caution in hypothesis testing.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-5. Standard errors for table 5: Among fall 2009 ninth-graders who never enrolled in postsecondary education, percentage who had been unemployed for at least 1 month between leaving high school and February 2016, and among those, percentage who had received unemployment compensation, median number of months of longest unemployment spell, and median number of unemployment spells of 1 month or more, by student and high school characteristics: 2016

Characteristic	Percentage ever unemployed for at least 1 month	Ever unemployed for at least 1 month: Percentage who had received unemployment compensation	Ever unemployed for at least 1 month: Median number of months of longest unemployment spell	Ever unemployed for at least 1 month: Median number of unemployment spells of 1 month or more
Total	**1.60**	**1.26**	**1**	**^**
Sex				
Female	2.24	1.99	1	^
Male	1.88	1.37	1	^
Race/ethnicity				
White	1.77	1.55	1	^
Black	4.27	1.53	1	#
Hispanic	3.81	†	1	#
Asian	10.46	†	†	†
Other or Two or more races	5.67	†	1	#
Highest education attained by either parent				
High school credential or lower	2.26	1.58	1	^
Certificate or associate's degree	3.36	3.18	1	#
Bachelor's degree or higher	3.40	1.28	1	#
Mathematics achievement quintile				
Lowest fifth	2.74	1.99	1	^
Middle three-fifths	2.07	1.55	1	^
Highest fifth	5.75	†	1	1
Cumulative high school grade point average				
Less than 2.50	1.95	1.51	#	^
2.50–2.99	3.48	2.08	1	^
3.00–3.49	4.81	†	1	#
3.50 or higher	8.59	†	†	†
Control of high schools attended				
Only public	1.56	1.28	1	^
Only private	8.25	†	1	#
Both public and private	14.63	†	2	†

† Not applicable.
# Rounds to zero.
^ Standard error of quantile, as estimated by Woodruff method, is zero. Use caution in hypothesis testing.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-6. Standard errors for table 6: Among fall 2009 ninth-graders who never enrolled in postsecondary education, percentage who reported experiencing various financial circumstances during 2015, by student and high school characteristics: 2016

Characteristic	Worried about having enough money for regular expenses	Owed an amount on credit card bill that was carried over from a prior month	Increased borrowing or use of credit cards to pay expenses	Increased number of hours worked in order to pay expenses
Total	**1.68**	**1.37**	**1.33**	**1.82**
Sex				
Female	2.61	2.04	1.85	2.40
Male	2.10	1.72	1.68	2.43
Race/ethnicity				
White	1.92	1.51	1.27	1.94
Black	4.73	2.69	2.74	4.07
Hispanic	4.81	3.67	3.47	4.67
Asian	10.86	†	†	7.94
Other or Two or more races	4.22	5.48	5.72	5.43
Highest education attained by either parent				
High school credential or lower	2.31	1.75	1.70	2.17
Certificate or associate's degree	3.52	3.09	2.42	3.57
Bachelor's degree or higher	3.19	3.17	2.79	3.79
Mathematics achievement quintile				
Lowest fifth	2.75	1.89	2.28	2.83
Middle three-fifths	2.13	1.95	1.82	2.08
Highest fifth	6.34	3.69	2.70	5.94
Cumulative high school grade point average				
Less than 2.50	1.83	1.45	1.46	2.08
2.50–2.99	3.57	3.28	3.35	3.57
3.00–3.49	4.76	4.40	3.67	4.73
3.50 or higher	8.36	6.83	†	9.86
Control of high schools attended				
Only public	1.64	1.38	1.36	1.87
Only private	7.25	7.22	4.42	7.15
Both public and private	18.96	†	†	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-7. Standard errors for table 7: Percentage of fall 2009 ninth-graders who never enrolled in postsecondary education reporting that their parents regularly helped cover various needs in 2015, by student and high school characteristics: 2016

Characteristic	In 2015, parents regularly helped cover: Rent, room and board, or mortgage	Monthly bills, utilities, car payments, or credit card bills	Health care costs
Total	**1.90**	**1.28**	**1.55**
Sex			
Female	2.46	2.15	2.38
Male	2.51	1.62	2.19
Race/ethnicity			
White	1.65	1.22	1.84
Black	4.80	4.72	5.02
Hispanic	3.85	2.66	3.08
Asian	11.87	10.92	10.88
Other or Two or more races	3.81	3.06	3.37
Highest education attained by either parent			
High school credential or lower	2.09	1.48	1.78
Certificate or associate's degree	2.96	2.23	2.95
Bachelor's degree or higher	4.19	3.68	3.81
Mathematics achievement quintile			
Lowest fifth	2.84	2.47	2.82
Middle three-fifths	2.12	1.58	1.70
Highest fifth	5.87	4.50	4.57
Cumulative high school grade point average			
Less than 2.50	2.17	1.63	1.76
2.50–2.99	3.46	2.91	3.14
3.00–3.49	4.00	3.43	4.12
3.50 or higher	8.02	7.97	8.38
Control of high schools attended			
Only public	1.91	1.30	1.57
Only private	7.43	7.15	7.34
Both public and private	†	†	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-8. Standard errors for table 8: Percentage of fall 2009 ninth-graders who had enrolled in postsecondary education, and among them, percentage distribution of the number of months between completing or leaving high school and first entering postsecondary education, by student and high school characteristics: 2016

Characteristic	Ever enrolled in postsecondary education	Percentage distribution of the number of months between leaving high school and first entering postsecondary education				
		0–4 months	5–8 months	9–12 months	13–24 months	25 months or more
Total	**1.03**	**0.84**	**0.40**	**0.22**	**0.63**	**0.29**
Sex						
Female	1.16	0.96	0.62	0.23	0.67	0.35
Male	1.29	1.29	0.56	0.39	0.97	0.46
Race/ethnicity						
White	0.87	0.74	0.39	0.21	0.45	0.35
Black	2.63	2.49	1.46	1.01	1.67	0.70
Hispanic	2.47	2.67	1.22	0.52	2.27	0.83
Asian	2.56	2.40	1.02	†	1.56	0.99
Other or Two or more races	2.70	2.39	1.24	1.01	1.65	1.25
Highest education attained by either parent						
High school credential or lower	1.53	1.61	0.83	0.45	1.21	0.65
Certificate or associate's degree	1.61	1.58	0.76	0.37	1.34	0.71
Bachelor's degree or higher	0.92	0.79	0.50	0.28	0.50	0.25
Mathematics achievement quintile						
Lowest fifth	2.47	2.57	1.54	1.18	2.04	0.97
Middle three-fifths	1.11	1.09	0.58	0.27	0.80	0.44
Highest fifth	0.72	0.66	0.33	0.25	0.43	0.26
Cumulative high school grade point average						
Less than 2.50	1.67	2.53	1.13	0.73	1.98	1.01
2.50–2.99	1.73	1.27	0.86	0.41	0.99	0.52
3.00–3.49	0.80	0.96	0.47	0.15	0.79	0.33
3.50 or higher	0.49	0.61	0.40	†	0.41	0.31
Control of high schools attended						
Only public	1.11	0.91	0.43	0.25	0.69	0.33
Only private	0.91	0.90	0.52	†	0.63	†
Both public and private	5.31	4.50	†	†	1.73	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-9. Standard errors for table 9: Among fall 2009 ninth-graders who had enrolled in postsecondary education, percentage distribution of control and level of institution in which they first enrolled after high school, by student and high school characteristics: 2016

Characteristic	Public 2-year	Public 4-year	Private nonprofit 4-year	For-profit 4-year	For-profit 2-year	For-profit less-than-2-year	Other
Total	**1.05**	**0.96**	**0.68**	**0.23**	**0.24**	**0.27**	**0.36**
Sex							
Female	1.28	1.14	0.85	0.35	0.38	0.29	0.51
Male	1.55	1.37	0.89	0.31	0.33	0.39	0.44
Race/ethnicity							
White	1.17	1.17	0.86	0.25	0.25	0.21	0.30
Black	3.08	2.98	2.08	0.80	0.78	0.56	0.95
Hispanic	2.75	2.35	2.18	0.62	0.82	0.96	0.61
Asian	4.03	3.15	3.51	†	†	0.25	†
Other or Two or more races	2.95	3.14	1.28	0.95	1.03	0.88	2.74
Highest education attained by either parent							
High school credential or lower	1.64	1.54	1.49	0.54	0.54	0.74	0.55
Certificate or associate's degree	2.26	1.83	1.28	0.34	0.46	0.36	1.19
Bachelor's degree or higher	1.13	1.18	1.06	0.25	0.29	0.12	0.23
Mathematics achievement quintile							
Lowest fifth	3.03	2.26	1.38	0.76	1.17	0.84	1.36
Middle three-fifths	1.33	1.22	0.76	0.35	0.35	0.45	0.49
Highest fifth	1.12	1.28	1.39	0.23	†	†	0.13
Cumulative high school grade point average							
Less than 2.50	1.99	1.41	0.81	0.54	0.80	0.90	1.38
2.50–2.99	2.18	2.17	1.07	0.55	0.39	0.54	0.44
3.00–3.49	1.77	1.88	1.65	0.41	†	†	0.20
3.50 or higher	1.32	1.66	1.51	0.28	†	†	0.18
Control of high schools attended							
Only public	1.13	1.06	0.68	0.25	0.27	0.29	0.40
Only private	2.17	1.96	2.99	0.40	†	†	†
Both public and private	4.34	5.97	8.42	†	†	†	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-10. Standard errors for table 10: Among fall 2009 ninth-graders who had enrolled in an undergraduate degree or certificate program between completing or leaving high school and February 2016, percentage distribution of major field of study in their most recent undergraduate degree or certificate program, by student and high school characteristics: 2016

Characteristic	Don't know or undecided	Computer and information sciences	Engineering and engineering technology	Biological and physical science, science technology, mathematics, and agriculture	Health fields	Business	Education	Social sciences	Humanities	Other applied	Other
Total	**0.36**	**0.33**	**0.42**	**0.61**	**0.83**	**0.59**	**0.42**	**0.62**	**0.37**	**0.73**	**0.35**
Sex											
Female	0.51	0.23	0.36	0.79	1.34	0.66	0.60	0.67	0.48	0.87	0.57
Male	0.63	0.65	0.78	0.72	0.66	0.92	0.55	0.86	0.54	1.22	0.33
Race/ethnicity											
White	0.40	0.36	0.50	0.80	0.77	0.68	0.48	0.43	0.46	0.80	0.34
Black	1.65	1.06	0.98	1.37	2.24	2.39	1.08	2.55	0.79	2.39	1.01
Hispanic	1.15	0.79	1.55	1.09	2.26	1.50	1.48	1.84	1.01	2.46	1.40
Asian	3.46	1.50	2.09	3.40	2.23	2.29	0.60	2.25	1.65	3.41	†
Other or Two or more races	1.32	0.92	1.13	1.81	2.98	2.13	0.79	1.23	1.02	3.27	0.72
Highest education attained by either parent											
High school credential or lower	0.89	0.50	0.87	0.82	1.60	1.02	0.64	1.15	0.53	1.70	0.95
Certificate or associate's degree	1.04	0.74	1.45	1.15	1.45	1.47	1.06	1.39	0.63	1.79	0.43
Bachelor's degree or higher	0.52	0.51	0.65	0.85	0.82	0.72	0.54	0.58	0.60	0.80	0.35
Mathematics achievement quintile											
Lowest fifth	1.77	0.69	†	0.90	3.41	1.91	1.95	1.03	0.83	2.63	1.20
Middle three-fifths	0.55	0.41	0.58	0.56	1.12	0.85	0.52	0.73	0.43	0.94	0.38
Highest fifth	0.49	0.59	0.93	1.38	0.78	1.03	0.58	1.08	0.76	0.93	0.55

See notes at end of table.

Table A-10. Standard errors for table 10: Among fall 2009 ninth-graders who had enrolled in an undergraduate degree or certificate program between completing or leaving high school and February 2016, percentage distribution of major field of study in their most recent undergraduate degree or certificate program, by student and high school characteristics: 2016—Continued

Characteristic	Don't know or undecided	Computer and information sciences	Engineering and engineering technology	Biological and physical science, science technology, mathematics, and agriculture	Health fields	Business	Education	Social sciences	Humanities	Other applied	Other
Cumulative high school grade point average											
Less than 2.50	1.18	0.81	1.16	0.63	1.80	1.34	1.27	1.04	0.64	1.83	0.74
2.50–2.99	0.90	0.60	0.92	0.93	1.36	1.34	0.80	1.53	0.88	1.69	1.18
3.00–3.49	0.53	0.53	0.87	0.89	1.52	1.27	0.72	1.25	0.60	1.38	0.47
3.50 or higher	0.46	0.49	0.86	1.49	1.11	0.94	0.76	0.81	0.63	0.95	0.31
Control of high schools attended											
Only public	0.41	0.34	0.46	0.68	0.92	0.65	0.46	0.56	0.36	0.80	0.39
Only private	0.55	0.67	0.81	1.02	1.45	1.57	0.69	1.45	1.40	1.27	0.28
Both public and private	2.82	2.03	†	3.02	3.20	5.10	†	10.60	3.02	3.97	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-11. Standard errors for table 11: Among fall 2009 ninth-graders who ever enrolled in postsecondary education, percentage distribution of attainment and retention at first institution as of February 2016, by student and high school characteristics: 2016

	Highest credential attained at first institution			If no credential attained at first institution, retention status at first institution		
Characteristic	Undergraduate certificate	Associate's degree	Bachelor's degree	Enrolled at first institution	Enrolled at a different institution	Not enrolled at any institution
Total	**0.40**	**0.38**	**0.11**	**0.96**	**0.49**	**0.82**
Sex						
Female	0.48	0.51	0.16	1.29	0.68	1.14
Male	0.69	0.51	0.12	1.27	0.82	0.99
Race/ethnicity						
White	0.42	0.49	0.16	0.99	0.61	0.83
Black	0.91	0.90	†	3.25	2.12	2.87
Hispanic	1.44	1.06	†	2.78	1.35	2.74
Asian	1.04	1.36	†	3.29	2.22	2.97
Other or Two or more races	1.32	1.21	†	3.36	2.08	2.80
Highest education attained by either parent						
High school credential or lower	1.02	0.60	0.17	1.56	1.00	1.85
Certificate or associate's degree	0.66	0.92	0.22	1.99	1.21	1.62
Bachelor's degree or higher	0.38	0.52	0.20	1.16	0.77	0.84
Mathematics achievement quintile						
Lowest fifth	1.76	0.65	†	3.05	2.03	2.87
Middle three-fifths	0.61	0.52	0.10	1.10	0.76	1.15
Highest fifth	0.26	0.68	0.30	1.56	1.02	0.99
Cumulative high school grade point average						
Less than 2.50	1.39	0.70	†	1.66	1.19	1.86
2.50–2.99	0.72	0.82	0.16	2.00	1.17	1.72
3.00–3.49	0.39	0.71	0.19	1.58	1.03	1.51
3.50 or higher	0.36	0.91	0.29	1.71	0.91	0.97
Control of high schools attended						
Only public	0.44	0.43	0.12	1.11	0.54	0.91
Only private	†	0.81	†	2.91	1.46	1.59
Both public and private	†	†	†	6.58	4.87	3.62

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-12. Standard errors for table 12: Among fall 2009 ninth-graders who ever enrolled in postsecondary education, percentage distribution of attainment and persistence at any institution as of February 2016, by student and high school characteristics: 2016

Characteristic	Highest credential attained at any institution			If no credential attained, persistence status at any institution		
	Undergraduate certificate	Associate's degree	Bachelor's degree	Enrolled at 4-year institution	Enrolled at less-than-4-year institution	Not enrolled
Total	**0.50**	**0.42**	**0.12**	**1.03**	**0.81**	**0.80**
Sex						
Female	0.64	0.54	0.19	1.26	0.92	1.14
Male	0.76	0.56	0.12	1.33	1.41	0.95
Race/ethnicity						
White	0.48	0.53	0.16	1.11	0.64	0.74
Black	1.19	0.98	†	2.66	2.61	2.78
Hispanic	1.85	1.13	0.23	2.05	3.09	2.63
Asian	1.05	1.41	†	4.39	3.10	2.98
Other or Two or more races	1.39	1.23	†	3.40	3.08	2.73
Highest education attained by either parent						
High school credential or lower	1.22	0.67	0.17	1.54	1.77	1.80
Certificate or associate's degree	1.08	0.95	0.23	1.60	1.66	1.83
Bachelor's degree or higher	0.42	0.55	0.24	1.19	0.97	0.77
Mathematics achievement quintile						
Lowest fifth	2.45	0.75	†	2.02	2.27	2.61
Middle three-fifths	0.74	0.59	0.11	1.19	1.22	1.11
Highest fifth	0.37	0.70	0.35	1.34	0.86	0.98
Cumulative high school grade point average						
Less than 2.50	1.54	0.77	†	1.32	1.94	1.91
2.50–2.99	0.85	0.87	0.17	1.89	2.02	1.63
3.00–3.49	0.66	0.74	0.24	1.84	1.51	1.49
3.50 or higher	0.40	0.91	0.31	1.58	0.65	0.94
Control of high schools attended						
Only public	0.56	0.47	0.14	1.13	0.87	0.91
Only private	0.96	0.89	†	2.74	1.29	1.46
Both public and private	†	†	†	6.18	3.84	3.59

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-13. Standard errors for table 13: Among fall 2009 ninth-graders who ever enrolled in postsecondary education, percentage who had not attained a postsecondary credential and were no longer enrolled as of February 2016, and among these, percentage reporting various reasons for not being enrolled, by student and high school characteristics: 2016

Characteristic	Did not attain a credential and not enrolled	Among those not enrolled, reasons for not being enrolled				
		Academic	Financial	Personal or family	Work-related	None of these
Total	**0.80**	**1.82**	**2.37**	**1.99**	**1.66**	**1.08**
Sex						
Female	1.14	2.61	3.19	2.81	1.78	1.70
Male	0.95	2.05	3.20	2.63	2.99	1.21
Race/ethnicity						
White	0.74	1.74	2.66	2.15	1.96	1.42
Black	2.78	4.90	5.11	5.49	3.64	2.59
Hispanic	2.63	5.04	7.81	4.58	4.83	2.25
Asian	2.98	4.74	9.11	12.64	12.40	†
Other or Two or more races	2.73	5.32	5.55	5.33	3.46	3.05
Highest education attained by either parent						
High school credential or lower	1.80	2.86	3.49	2.88	2.64	1.69
Certificate or associate's degree	1.83	3.94	4.63	4.46	2.65	1.71
Bachelor's degree or higher	0.77	3.06	3.07	2.96	2.59	1.64
Mathematics achievement quintile						
Lowest fifth	2.61	5.02	5.21	6.00	3.74	2.66
Middle three-fifths	1.11	2.33	2.87	2.52	2.06	1.35
Highest fifth	0.98	4.15	4.32	4.00	3.80	2.26
Cumulative high school grade point average						
Less than 2.50	1.91	3.11	3.71	3.19	3.23	1.82
2.50–2.99	1.63	3.42	3.84	3.49	3.40	1.99
3.00–3.49	1.49	3.58	4.74	4.89	3.09	1.85
3.50 or higher	0.94	4.56	6.25	6.68	4.73	4.14
Control of high schools attended						
Only public	0.91	1.86	2.45	2.06	1.74	1.12
Only private	1.46	4.93	5.81	5.41	3.31	4.39
Both public and private	3.59	†	†	13.02	†	†

† Not applicable.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-14. Estimates for figure 1: Percentage distribution of fall 2009 ninth-graders' postsecondary enrollment and labor force participation status in February 2016, by high school completion, postsecondary enrollment, and postsecondary attainment status: 2016

Characteristic	Percentage
Total	**100.0**
Had not earned a high school credential by February 2016[1, 2]	4.1
Had earned a high school credential by February 2016[1]	95.9
Among those who had not earned a high school credential by February 2016[1]	
Employed	66.6
Unemployed	20.3
Not in the labor force	13.1
Among those who had earned a high school credential[1]	
Had not enrolled in postsecondary education by February 2016	24.8
Had enrolled in postsecondary education by February 2016	75.2
Among those who had not enrolled in postsecondary education by February 2016	
Employed	70.1
Unemployed	16.9
Not in the labor force	13.0
Among those who had earned a high school credential and had enrolled in postsecondary education[1]	
Had not attained a postsecondary credential by February 2016	87.5
Had attained a postsecondary credential by February 2016	12.5
Among those who had not attained a postsecondary credential by February 2016[3]	
Enrolled and employed	48.5
Enrolled and unemployed	6.8
Enrolled and not in the labor force	19.3
Not enrolled and employed	19.0
Not enrolled and unemployed	3.3
Not enrolled and not in the labor force	3.1
Among those who had attained a postsecondary credential by February 2016[3]	
Enrolled and employed	25.9
Enrolled and unemployed	3.2
Enrolled and not in the labor force	11.7
Not enrolled and employed	47.4
Not enrolled and unemployed	6.5
Not enrolled and not in the labor force	5.2 !

! Interpret data with caution. Estimate is unstable because the standard error is more than 30 percent but no greater than 50 percent of the estimate.
[1] Includes high school diploma, equivalency, and certificate of attendance or completion.
[2] About 6.8 percent of those who had not earned a high school credential by February 2016 had enrolled in postsecondary education by February 2016 after leaving high school.
[3] Includes certificates, associate's degrees, and bachelor's degrees.
NOTE: Enrollment in postsecondary education refers to postsecondary enrollment that occurred after the student left high school with or without a credential and by February 2016. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

Table A-15. Standard errors for table A-14 and figure 1: Percentage distribution of fall 2009 ninth-graders' postsecondary enrollment and labor force participation status in February 2016, by high school completion, postsecondary enrollment, and postsecondary attainment status: 2016

Characteristic	Percentage
Total	†
Had not earned a high school credential by February 2016	0.34
Had earned a high school credential by February 2016	0.34
Among those who had not earned a high school credential by February 2016	
Employed	4.07
Unemployed	3.47
Not in the labor force	2.39
Among those who had earned a high school credential	
Had not enrolled in postsecondary education by February 2016	0.94
Had enrolled in postsecondary education by February 2016	0.94
Among those who had not enrolled in postsecondary education by February 2016	
Employed	1.64
Unemployed	1.42
Not in the labor force	1.05
Among those who had earned a high school credential and had enrolled in postsecondary education	
Had not attained a postsecondary credential by February 2016	0.68
Had attained a postsecondary credential by February 2016	0.68
Among those who had not attained a postsecondary credential by February 2016	
Enrolled and employed	0.92
Enrolled and unemployed	0.51
Enrolled and not in the labor force	0.79
Not enrolled and employed	0.73
Not enrolled and unemployed	0.35
Not enrolled and not in the labor force	0.38
Among those who had attained a postsecondary credential by February 2016	
Enrolled and employed	2.10
Enrolled and unemployed	0.73
Enrolled and not in the labor force	1.46
Not enrolled and employed	2.66
Not enrolled and unemployed	1.17
Not enrolled and not in the labor force	1.68

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Second Follow-Up.

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Appendix B—Analysis Variables

Attainment and persistence at any institution (X4ATPRLVLA)
This variable indicates the highest credential that respondents had attained at any institution. If the respondent had not earned a credential, the variable indicates the level of the institution at which the respondent was enrolled in February 2016. Respondents who had attained a credential and were still enrolled in February 2016 were classified by the highest credential they had attained as of February 2016.

Attainment and retention at first institution (X4ATPRTFI)
This variable identifies respondents' attainment at the first institution attended. If the respondent had not earned a credential at the first institution, the variable indicates retention status at the first institution in February 2016. Respondents who had attained a credential at their first institution and were still enrolled in February 2016 were classified by the highest credential they had attained at their first institution as of February 2016.

Control of high schools attended (X41CONTROL)
This variable uses information from the base-year, first follow-up, 2013 Update, and second follow-up data collections to identify whether respondents attended only public high schools, only private high schools, or a mix of both public and private high schools. For a given time point, the control of the last high school attended was used when a respondent was not attending high school (e.g., dropped out, graduated) or when the respondent did not respond to the survey. Each school's control was identified using the National Center for Education Statistics (NCES) Common Core of Data (CCD) or the Private School Universe Survey (PSS).

Cumulative high school grade point average (X3TGPATOT)
This variable indicates students' high school grade point average (GPA) based on all courses recorded on their high school transcripts and adjusted to a 4.0 scale. In this report, this continuous variable was recoded to the following categories: less than 2.50, 2.50–2.99, 3.00–3.49, and 3.50 or higher.

Ever unemployed for at least 1 month (S4UNEMPEVER)
This variable indicates whether the respondent had ever been unemployed, that is, not working and actively looking for work, for at least 1 month between leaving high school with or without a credential and February 2016.

Financial circumstances (S4EVERWRYMNY, S4EVERCRDBAL, S4EVERBRWMORE, S4EVERWRKMORE)
For this set of variables respondents were asked if they experienced various financial circumstances in calendar year 2015. These included worrying about having enough money for regular expenses (S4EVERWRYMNY), owing an amount on a credit card account that was carried over from a prior month (S4EVERCRDBAL), increasing borrowing or use of credit cards to pay expenses (S4EVERBRWMORE), and working more hours to pay for expenses (S4EVERWRKMORE).

First postsecondary institution control and level (X4PS1SECTOR)
This variable indicates the control, level, and highest degree offered by the first postsecondary institution that respondents attended after high school. Public 4-year non-doctorate-granting institutions are divided into two categories: those that confer at least half of awards below the bachelor's degree and those that confer most awards at the bachelor's level or higher. Categories were aggregated to form the following categories: public 4-year institutions, private nonprofit 4-year institutions, and other institutions (including private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year colleges).

Had enrolled in postsecondary education (X4EVRATNDCLG)

This variable indicates whether students had attended college after completing or leaving high school as of February 2016. In the 2016 second follow-up questionnaire, respondents were asked if they had ever attended college or trade school after they earned a high school diploma, high school equivalency, (e.g., GED, HiSET, or TASC), or certificate of attendance, or, if they had not completed one of these credentials, after they left high school. Postsecondary attendance was defined to include enrollment in an undergraduate degree or certificate program as well as taking classes outside of such a program. College classes taken while in high school and enrollment in an adult high-school-completion program at a college were not considered postsecondary enrollment.

Highest education attained by either parent (X2PAREDU)

This variable indicates the highest level of education achieved by either parent. It is constructed from two composite variables (X2PAR1EDU and X2PAR2EDU) that are based on data collected in the first follow-up parent questionnaire, and, if missing, are imputed from the base-year parent questionnaire and the first follow-up student questionnaire. Categories for no high school credential and completion of a high school diploma or alternative credential were combined into a single category labeled "high school credential or lower." The next two categories ("certificate or diploma from a school providing occupational training" and "associate's degree") were combined into the category "certificate or associate's degree." The top three categories ("Bachelor's degree," "Master's degree" and "Ph.D./M.D./Law/other high-level professional degree") were also combined into a single category ("Bachelor's degree or higher").

High school completion status as of February 2016 (X4HSCOMPSTAT)

This variable indicates high school completion status as of February 2016. It uses data from high school transcripts, student or parent responses to the 2013 Update survey, the GED testing service, and student responses to the second follow-up survey. If data sources are inconsistent, high school diploma is selected over high school equivalency or certificate of attendance, though respondents with an early high school completion date had to meet more stringent requirements to be updated as having earned a high school diploma.

Hours worked (X4EMPHRSFB16)

This variable indicates the average number of hours that respondents worked per week at the job they held in February 2016. Respondents who held more than one job for pay in February 2016 were instructed to report on the job at which they worked the most hours.

Income was $10,000 or less in 2015 (X4INCOMECAT)

This variable reflects the respondent's 2015 calendar income. The following priority order was used to assign values: the respondent's 2015 adjusted gross income reported in the 2016–17 Free Application for Federal Student Aid (FAFSA), the respondent's 2015 adjusted gross income reported in the 2017–18 FAFSA, the respondent's responses to the student interview variable S4INCOMECAT, the respondent's 2015 income earned from work reported in the 2016–17 FAFSA, and the respondent's 2015 income earned from work reported in the 2017–18 FAFSA. The 2016–17 FAFSA used income information from the prior year (2015), but the 2017–18 FAFSA began using income information from 2 years prior (also 2015). Thus, both FAFSAs provide 2015 income information.

Major field of study in most recent undergraduate degree or certificate program (X4RFDGMJ14Y)

This variable indicates the respondent's major field of study for the degree or certificate the respondent was working on in February 2016 or most recently before February 2016. In the case of a double major, the major field is the major field the respondent reported first. This variable is based on the U.S. Department of Education's Classification of Instructional Programs (CIP 2010).[1]

[1] https://nces.ed.gov/ipeds/cipcode/

Mathematics achievement quintile (X2TXMQUINT)

This variable indicates students' achievement in algebra content and processes based on their performance during the first follow-up on the HSLS:09-specific mathematics assessment. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more on the items covered see A.11 in Dalton et al. (2016).

The variable is a norm-referenced measure of achievement. The quintile score divides the weighted (population estimate) achievement distributions into five equal groups, based on the continuous math score (X2TXMTSCOR). Quintile 1 corresponds to the lowest-achieving one-fifth of the population, and quintile 5 corresponds to the highest. For more information on the design of the assessment, the modeling of scores using IRT, and the derivation of the mathematics quintile variable see chapter 2 of the *HSLS:09 Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

Months between leaving high school and first entering postsecondary education (X4HS2PSMOS)

This variable indicates the number of months between respondents' high school departure and postsecondary entry. For respondents who received a high school diploma, high school equivalency, (e.g., GED, HiSET, or TASC), or certificate of attendance, high school departure is the month and year the respondent earned this credential. For other respondents, high school departure is the month and year the respondent last attended high school. Postsecondary entry is based on the start date for the first postsecondary institution after high school.

Number of months unemployed (S4UNEMPDUR)

This variable indicates the longest period of time, in months, the respondent was unemployed, that is, not working and actively looking for work, between leaving high school and February 2016.

Number of unemployment spells (S4UNEMPFREQ)

This variable indicates the respondent's number of unemployment spells (periods of unemployment, that is, periods when not working and actively looking for work, lasting 1 month or more) between leaving high school and February 2016.

Parents regularly helped cover various needs (S4PARHOUSING, S4PARBILLS, S4PARHEALTH)

For this set of variables respondents were asked if their parents/guardians regularly, occasionally, or never contributed to or paid for respondents' rent, room and board, or a mortgage (S4PARHOUSING); monthly bills such as utilities, car payments, or credit card bills (S4PARBILLS); and health care expenses (S4PARHEALTH).

Postsecondary enrollment and labor force participation status (X4PSLFSTFB16)

This variable indicates whether respondents were enrolled and whether they were employed full time, employed part time, unemployed, or not in the labor force in February 2016. Respondents are classified as "unemployed" if they were not working and were actively looking for work. Respondents who had never held a job after high school are classified as "unemployed" if they were actively looking for work in February 2016 and classified as "not in the labor force" if they were not actively looking for work. Full-time employment is defined as working 35 hours or more per week.

VARIABLE

Race/ethnicity (X2RACE)

This variable updates the base-year variable, X1RACE. It is a composite rendering of the racial and ethnic group to which a student belongs, based on separate questions about race and Hispanic ethnicity. Race/ethnicity is based on the base-year student questionnaire; if missing, it is based on, in order of preference, data from the school-provided sampling roster or data on biological parents from the base-year parent questionnaire. If race/ethnicity is missing from these base-year sources, it is updated with the first follow-up student questionnaire. If the student's race/ethnicity is still missing, it is updated using race/ethnicity information for biological parents from the first-follow-up parent questionnaire. The categories used in this report include White; Black; Asian; Hispanic; and other or two or more races, where "other" includes American Indian or Alaska Native and Native Hawaiian or other Pacific Islander. All Hispanic respondents were placed in the Hispanic category regardless of race.

Reasons for not enrolling in postsecondary education (S4NOENRACAD, S4NOENRFIN, S4NOENRFAM, S4NOENRWRK, S4NOENRNONE)

For this set of variables, respondents who had not attended college or trade school by the end of February 2016 were asked to select from the following reasons that described why they had not attended: academic reasons (S4NOENRACAD); financial reasons (S4NOENRFIN); personal or family reasons (S4NOENRFAM); work, military, or career-related reasons (S4NOENRWRK); or none of these reasons (S4NOENRNONE). Respondents could choose one or more among the four categories—academic; financial; personal or family; and work, military, or career-related reasons—or none of these.

Reasons for no longer being enrolled in postsecondary education (S4LEFTACAD, S4LEFTFIN, S4LEFTFAM, S4LEFTWRK, S4LEFTNONE)

For this set of variables, respondents who had not completed their most recent degree or certificate and were no longer attending the institution at which they were working on that degree or certificate were asked to select from the following reasons that described why they had left: academic reasons (S4LEFTACAD); financial reasons (S4LEFTFIN); personal or family reasons (S4LEFTFAM); work, military, or career-related reasons (S4LEFTWRK); or none of these reasons (S4LEFTNONE). Respondents could choose one or more among the four categories—academic; financial; personal or family; and work, military, or career-related reasons—or none of these.

Received unemployment compensation (S4UNEMPCOMP)

This variable indicates whether the respondent had ever received unemployment compensation between leaving high school and February 2016.

Relationship between job expected to have at age 30 and current job (X4OCC30RELATE)

This variable indicates how closely respondents' present job—that is, their February 2016 job, or if respondents were not working in that month, the job they held most recently before then—was related to the job they expected to have at age 30. All respondents were asked what job they expected to hold at age 30 and were given the option to indicate that they did not know or did not plan to work. Those who specified an expected job at age 30 and who had worked for pay between leaving high school and February 2016 were then asked how closely their present job—that is, their February 2016 job, or if respondents were not working in that month, the job they held most recently before then—was related to the job they expected to have at age 30.

Sex (X2SEX)

This variable updates the base-year variable, X1SEX. It is based on the base-year student questionnaire; if missing, it is based on the base-year parent questionnaire or school-provided sampling roster. If the sex indicated by any of these three sources is inconsistent, it is coded based on a review of student name records. If sex is missing from these base-year sources, it is updated with data from the first follow-up student questionnaire.

Appendix C—Technical Notes and Methodology

Appendix C provides information about the High School Longitudinal Study of 2009 (HSLS:09), as well as information about the statistical procedures and analysis variables used in this report. The HSLS:09 second follow-up is discussed in the first eight sections (C.1 through C.8). This discussion is followed by information on the report's statistical procedures (C.9), variance estimation (C.10), and use of PowerStats (C.11). *HSLS:09 Base-Year to Second Follow-Up Data File Documentation* (Duprey et al. 2018) provides a comprehensive discussion of the second follow-up and summary discussions of previous HSLS:09 data collections. For detailed information on the HSLS:09 base year, see *HSLS:09 Base-Year Data File Documentation* (Ingels et al. 2011); for the first follow-up, see *HSLS:09 Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014); and for the 2013 Update and High School Transcript collection, see *HSLS:09 2013 Update and High School Transcript Data File Documentation* (Ingels et al. 2015).

C.1 Design and Purposes of HSLS:09

HSLS:09 is the fifth in a series of National Center for Education Statistics (NCES) secondary education longitudinal studies. Each of these studies provides information on U.S. students' transition from high school to young adulthood, including their experiences with further education, participation in the work force, and assumption of other adult roles (e.g., marriage and family formation). The core research questions for HSLS:09 explore secondary-to-postsecondary transition plans and the evolution of those plans; the paths into and out of science, technology, engineering, and mathematics (STEM) curricula and occupations; and the educational and social experiences that affect these transitions.

The HSLS:09 base-year administration took place in the 2009–10 school year, with a randomly selected sample of fall-term ninth-graders in 944 public and private high schools with both a ninth and an eleventh grade. Students took a mathematics assessment and a survey online. In addition, students' parents, school administrators, and mathematics and science teachers, as well as the school's lead counselor, completed surveys on the phone or the Web.

The first follow-up of HSLS:09 took place in 2012, when most sample members were in the spring term of the eleventh grade. Students who transferred to another school, who became homeschooled, who completed high school, who earned a high school equivalency, and who dropped out were followed, as well as those who remained in the base-year high school. Sample members were eligible to complete both a questionnaire and a mathematics assessment. In addition to the student questionnaire and mathematics assessment, surveys were also administered to sample members' parents, administrators, and counselors.

The 2013 Update survey took place between June and December 2013. The survey, which could be completed by the sample member or a parent, was designed to gather basic information about sample members' high school completion status or plans, postsecondary education and work plans, and the college application and financing process. Questions were designed so that sample members could provide information about themselves, or parent respondents could provide information about their child's activities and plans. Some of these questions were subjective (e.g., reasons for choosing a college), and parents' and students' responses to these questions may differ systematically. The survey was administered over the course of several months that preceded and overlapped with the traditional start of college classes in the fall; therefore, a number of questions were anchored to November 1, 2013 to ensure that respondents had a common reference point.

Between fall 2013 and spring 2014, high school transcripts were gathered from all high schools that students had attended, including schools known from prior data collection rounds, schools identified by the student or parent during the 2013 Update survey, and schools identified during the request for transcripts from already known schools. Coursetaking records from transcripts were keyed and coded using the School Courses for the Exchange of Data (SCED), a system for classifying elementary and secondary school courses into standard 12-digit codes reflecting their course content and placement within subjects. HSLS:09's use of SCED marked NCES's first use of SCED on any of its transcript studies. Course credits, course grades, and other measures derived from transcripts were standardized to ensure comparability across schools.[2] In addition, student records were matched to external data sources to obtain SAT and ACT scores, Free Application for Federal Student Aid (FAFSA) data, and GED completion data.

The second follow-up, conducted between March 2016 and January 2017, was designed to collect information from the cohort approximately 3 years after the modal high school completion date. The second follow-up survey explored a variety of

[2] See chapter 5 of *HSLS:09 2013 Update and High School Transcript File Documentation* (Ingels et al. 2015) for details on transcript keying and coding systems and protocols used in the high school transcript data collection.

academic and employment-related topics that include, but are not limited to, high school completion and experiences, college enrollment history and future enrollment plans, and employment and unemployment history. The second follow-up survey collected information on each of these diverse activities while continuing to capture information on students' experiences and the influences and constraints on their decision-making about postsecondary education, fields of study, and occupations. Selected survey items paid particular attention to students' experience with and choices related to STEM fields. Respondents were asked to anchor their responses for a number of questions to the end of February 2016 (the month before data collection began), and many questions asked specifically about the respondent's activities and status in that month.

The second follow-up also covered a range of topics related to family, community, and personal characteristics including marital and parental status, household composition, financial well-being, community engagement (e.g., citizenship, voting registration, volunteering), personal characteristics and values (e.g., disabilities, sexual orientation and gender identity, experiences of discrimination, life values), and significant life events (e.g., job loss, death, serious injury or illness).

In addition to information obtained from sample members who participated in the second follow-up survey, data were obtained in 2017 from postsecondary institutions as part of the student financial aid records and postsecondary transcript collection. Financial aid data records include data collected from the institutions sample that members attended, and federal student loan records from the Department of Education's Office of Federal Student Aid. Records collected from the institutions attended by HSLS:09 sample members provide detailed information about students' enrollment patterns, degree programs or other programs of study, progress toward degree, and costs of attendance. The postsecondary transcript data[3] cover postsecondary coursetaking through 2016 and provide detailed information on students' academic experience, including coursetaking, academic performance, credit accumulation, enrollment periods, and transfer between institutions. These data are scheduled for release in 2019.

C.2 Instrumentation

The goal for developing the content of the second follow-up instrument was to design a web survey that, in conjunction with data collected in previous rounds of the study, could provide information on sample member's choices related to secondary education completion, postsecondary education, entry into the workforce,

[3] Coursetaking records from postsecondary transcripts were keyed and coded using the Classification of Instructional Programs (CIP) taxonomic scheme.

and family formation. The second follow-up survey not only collected new information about sample members' activities, but also updated information obtained in previous data collections and gathered information that was missing in prior rounds of the study (either from item- or unit-level nonresponse).

The survey was designed for self-administration on the Web as well as interviewer administration via telephone or in-person interviews. The web instrument could be completed on a desktop or laptop computer or a mobile device such as a tablet or smartphone. The survey did not have to be completed in a single session or in a single mode. Respondents could begin the survey, log out, and resume where they left off at a later time. Moreover, respondents could switch modes across survey sessions. For example, they could begin the survey on their own and later complete the survey with an interviewer. For sample members who decided to complete the survey over the phone or in-person, trained interviewers administered the survey, following instructions on each screen that indicated how each question was to be administered (e.g., whether the response options were to be read aloud, and when to probe for more information).

In developing the survey instrument, a primary challenge was to minimize respondent burden while collecting as much information as possible. One way to do this was by routing the survey around questions when the answer could be logically inferred from the answer provided to an earlier question. Additionally, the full-length survey instrument was used from the beginning of data collection through December 11, 2016, at which time it was replaced by an abbreviated instrument to encourage the remaining nonrespondents to participate. Survey respondents who partially completed the full-length instrument before that date and resumed after that date were automatically switched from the full-length to the abbreviated survey.

C.3 Sample Design

In the base year of HSLS:09, students were sampled through a two-stage process. First, stratified probability proportional to size (PPS) sampling was used to select schools. Sampling and school recruitment resulted in the identification and contacting of 1,889 eligible base-year schools. A total of 944 of these schools participated in the study, resulting in a 56 percent weighted (50 percent unweighted) school response rate. The target population at the school level was defined as regular public schools, including public charter schools, and private schools[4] in the 50

[4] The term "regular" refers to the setting and mode of instruction. Some examples of schools not considered regular are those that offer instruction in juvenile detention centers, schools that instruct only special education students, and schools where all the students may be homeschooled or where a mix of instructional modes is used (e.g., some students are homeschooled, some receive remote instruction, and some are in a common physical location).

United States and the District of Columbia, that provided instruction in both ninth and eleventh grades. HSLS:09 base-year school and student samples are nationally representative and state representative for 10 states.

The target population of students was defined to include all ninth-grade students who attended study-eligible schools in the fall 2009 term. In the second stage of sampling, students were randomly selected from school enrollment rosters, and 25,206 students (or about 27 students per school) were determined to be eligible. Of the 25,206 base-year sample members, 25,184 were eligible for the first follow-up (22 were deceased or ineligible[5]), 25,168 were eligible for the 2013 Update (a cumulative total of 38 were deceased or ineligible), and 25,167 were eligible for the High School Transcript Study (a cumulative total of 39 were deceased or ineligible). By the time of the second follow-up, 25,123 sample members were eligible because a cumulative total of 83 were found to be deceased or ineligible.

C.4 Response Rates

Table C-1 provides a summary of the weighted student unit response rates for each round of data collection. The second follow-up data collection ended with a 68 percent weighted response rate. Unweighted participation rates for the fielded sample may be found in *HSLS:09 Base-Year to Second Follow-Up Data File Documentation* (Duprey et al. 2018).

[5] Sample members were classified as study ineligible if they were not in ninth grade during the base-year data collection, they were not enrolled at the sampled high school during the base year, or if they were foreign exchange students. Study eligibility was confirmed during each round for sample members who had not yet been interviewed.

Table C-1. Summary of HSLS:09 response rates by data collection round and instrument

HSLS:09 round	Instrument	Eligible	Responded	Weighted response rate[1]
Base year	Student questionnaire	25,206	21,444	85.7
	Student assessment	25,206	20,781	83.0
	Parent questionnaire[2]	25,206	16,995	67.5
	School administrator[2]	25,206	23,800	94.5
	School counselor[2]	25,206	22,790	90.0
	Teacher questionnaires			
	Math teacher[2]	23,621	17,882	71.9
	Science teacher[2]	22,597	16,269	70.2
First follow-up	Student questionnaire	25,184	20,594	82.0
	Student assessment	25,184	18,507	73.0
	Parent questionnaire[3]	11,952	8,651	72.5
2013 Update	Questionnaire	25,168	18,558	73.1
High school transcript	High school transcript	25,167	21,928	87.7
Second follow-up	Questionnaire	25,123	17,335	67.9

[1] All weighted percentages are calculated with the student base weight.
[2] Note that, in *High School Longitudinal Study of 2009 (HSLS:09) 2013 Update and High School Transcript Study: A First Look at Fall 2009 Ninth-Graders in 2013*, weighted response rates were calculated using the analytic weight, rather than the student base weight, for these five instruments. Therefore, for these five instruments, the counts of eligible and responding sample members and weighted response rates differ between those reported in the 2013 Update First Look report and those reported here, which were calculated using the student base weight.
[3] A subsample of parents was selected to receive the parent survey in the first follow-up. Further details on the parent subsample design are provided in section 3.3.4 of the *High School Longitudinal Study of 2009 (HSLS:09) Base Year to First Follow-Up Data File Documentation*.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09), Base Year, First Follow-Up, 2013 Update, High School Transcript Study, and Second Follow-Up.

C.5 Weighting

Analytic weights are used in combination with software that accounts for the HSLS:09 complex survey design to produce estimates for the target population, with appropriate standard errors. When appropriately weighted, estimates from the HSLS:09 are generalizable to the U.S. population of ninth-graders who were attending schools with both a ninth and eleventh grade in fall 2009. Estimates in this report were produced using the base-year to first follow-up to 2013 Update to second follow-up weight (W4W1W2W3STU). This weight is appropriate for analyses involving base-year, first follow-up, 2013 Update, and second follow-up data; nonrespondents to one or more of these survey components are given a zero weight and do not count toward estimates. The weight's corresponding balanced repeated replicate (BRR) weights were used to compute standard errors. All estimates were computed in PowerStats.

C.6 Nonresponse Bias Analysis

The weighted response rate for the second follow-up fell below 85 percent (see table C-1). Therefore, in accordance with NCES statistical standards, the data were subjected to bias analysis. Unit nonresponse bias analyses were conducted for each set of respondents that corresponded to one of the seven analytic weights: the five second follow-up weights and the two supplemental teacher weights for the 2013 Update. The following 15 categorical variables were used to assess unit nonresponse bias: school type, charter school status, ninth-grade enrollment by race, total school enrollment, ninth-grade enrollment, number of full-time teachers, student-to-teacher ratio, census region, school urbanicity, school grade range, religious affiliation of school, secondary status of school, state of school, sex, and race. (Note that several of the 15 variables are derived from sampling frame data and are therefore not available in either restricted-use or public-use files.) These 15 variables in total comprise 67 categories. For each category, estimates of bias were calculated and statistical significance tests conducted. Table C-2 provides a summary of findings for the data components included in this report before and after the base weights were adjusted for nonresponse. Bias estimates for each of the 15 items above (with their corresponding categorizations), before and after weight adjustments, are provided in appendix G of *HSLS:09 Base-Year to Second Follow-Up Data File Documentation* (Duprey et al. 2018). Further information on the procedures for evaluating nonresponse bias and for their results can be found in chapter 6 of the same.

Table C-2. Summary statistics for unit nonresponse bias analyses before and after weight adjustments for nonresponse, by HSLS:09 second follow-up and supplemental 2013 update analytic weights

Analytic weight	Significant bias tests at 0.05 level[1]		Median absolute relative bias[2]		
	Percent before weight adjustment	Percent after weight adjustment	Percent before weight adjustment	Percent after weight adjustment	Percent relative change[3]
[W4STUDENT] Second follow-up	23.9	0	1.8	0	-100.0
[W4W1STU] Base-year to second follow-up	25.4	0	2.2	0	-100.0
[W4W1W2W3STU] Base-year to first follow-up to 2013 Update to second follow-up	37.3	0	2.8	0	-100.0
[W4W1STUP1] Base-year to second follow-up with base-year parent	38.8	1.5	2.9	0	-100.0
[W4W1STUP1P2] Base-year to second follow-up with base-year and first follow-up parent	38.8	1.5	4.9	0	-100.0
[W3W1STUA] Base-year to 2013 Update with base-year math teacher	52.2	16.4	7.4	3.3	-55.4
[W3W1STUB] Base-year to 2013 Update with base-year science teacher	41.8	7.5	7.2	2.6	-63.9

[1] "Before" and "after" are in reference to the nonresponse weight adjustment. A total of 67 statistical tests were performed; the number 67 was used as the basis for the reported percentages.
[2] The percent relative bias is calculated as 100 multiplied by the estimated bias divided by the estimated value. The absolute relative bias is the absolute value of the (percent) relative bias.
[3] The percent relative change is calculated as 100 multiplied by the median value after adjustment minus the median value before adjustment divided by the median value before adjustment.
NOTE: The percent relative change is the percentage decrease in median bias after weight adjustment. The formula for this was 100 * (median value after adjustment – median value before adjustment) / median value before adjustment.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09) Second Follow-Up.

C.7 Imputation

Imputation addresses the potential concern related to missing values in the data supplied by respondents. Advantages of using imputed values include the ability to use all study respondent records in an analysis (complete-case analysis), which affords more power for statistical tests. Additionally, if the imputation procedure is effective (i.e., the imputed value is equal to, or close to, the true value), the analysis results are likely less biased than those produced with the incomplete data file. (On both the benefits and techniques of imputation, see, for example, Little and Rubin 2002.)

To alleviate the problem of missing data from a respondent record, statistical imputation methods were employed for the second follow-up that were similar to those used for the HSLS:09 base year, first follow-up, and 2013 Update. Ten key

analysis variables were identified for single-value imputation from the second follow-up data: the respondent's high school credential status and type, as of February 2016 (X4HSCOMPSTAT); the date the respondent was awarded a high school credential (X4HSCOMPDATE); whether the respondent ever attended college, by the end of February 2016 (X4EVRATNDCLG); whether the respondent was attending college in February 2016 (X4ATNDCLG16FB); whether the respondent had any paid jobs since high school (X4ANYJOB); whether the respondent was working for pay in any job in February 2016 (X4WORKING16FB); what hours the respondent worked, on average, in February 2016 (X4EMPHRSFB16); whether the respondent was actively looking for work in February 2016 (X4UNEMP16FB); what the respondent's income was in 2015 (X4INCOMECAT); and whether the respondent had children (X4CHILDREN).

Stochastic methods were used to impute the missing values. Specifically, a weighted sequential hot-deck (WSHD; statistical) imputation procedure (Cox 1980; Iannacchione 1982) using the final second follow-up student analysis weight (W4STUDENT) was applied to the missing values for the variables listed above. The WSHD procedure replaces missing data with valid data from a donor record (i.e., item respondent) within an imputation class. In general, variables with lower item nonresponse rates were imputed earlier in the process. Regardless of the method, indicator variables (flags) were created to allow users to easily identify the imputed values. Further information on imputation procedures and quality checks can be found in chapter 6 of the *HSLS:09 Base-Year to Second Follow-Up Data File Documentation* (Duprey et al. 2018).

C.8 Disclosure Risk Analysis and Protections

The disclosure treatment methods used to produce the HSLS:09 second follow-up restricted-use and public-use data files include variable recoding, suppression, and swapping. Swapping was applied to both restricted-use and public-use data files, while variable suppression and recoding were used to create recoded versions of restricted-use variables that were suitable for inclusion in public-use data files.

Restricted-use variables were reviewed for their suitability for inclusion in public-use data files. Some restricted-use variables were classified as high risk and their values were not provided in the public-use data files; rather, recoded versions of these variables were provided in the public-use data files where all values of these variables were suppressed. (i.e., all values of these variables were set to a "data suppressed" reserve code[6]). Other restricted-use variables were included in the public-use data

[6] See section 3.10 of *HSLS:09 Base-Year to Second Follow-Up Data File Documentation* (Duprey et al. 2018) for details on reserve code values used in the second follow-up data files.

files but in a recoded form such that the recoded values represented at least 30 respondents. Note that a result of this recoding is that no continuous, restricted-use variables are included in the public-use data files.

C.9 Statistical Procedures in This Report

Comparisons that appear in the selected findings have been tested for statistical significance (set at a probability of 0.05) to ensure that the differences are larger than those that might be expected due to sampling variation. There were no adjustments for multiple comparisons. The conclusions stated in this report are supported by a two-tailed test of statistical significance, specifically, Student's *t* test. Whether the statistical test is considered significant is determined by calculating a *t* value for the difference between a pair of means or percentages and comparing this value to published tables of values, called critical values. The alpha level is an *a priori* statement of the probability that a difference exists in fact rather than by chance.

The *t* statistic between estimates from various subgroups presented in the tables can be computed by using the following formula:

$$t = \frac{x_1 - x_2}{\sqrt{SE_1^2 + SE_2^2}}$$

where x_1 and x_2 are the estimates to be compared (e.g., the means of sample members in two groups), and SE_1 and SE_2 are their corresponding standard errors. This formula is valid only for independent estimates.

C.10 Variance Estimation

The HSLS:09 sample design included stratification, disproportionate sampling of certain strata, and clustered (i.e., multistage) probability sampling. Therefore, the statistics generated from HSLS:09 data are more variable than they would have been if they had been based on data from a simple random sample of the same size.

Analysts can use any of several procedures to calculate estimates of sampling errors for complex samples such as HSLS:09. These procedures include both Taylor Series approximations and replication techniques (i.e., balanced repeated replicate [BRR], jackknife repeated replication, and bootstrapping), which can be found in advanced statistical programs such as Stata, SAS, SUDAAN®, AM, or WesVar. The standard errors for estimates in this report were calculated using replicate weights generated with a bootstrap technique.

C.11 PowerStats

The estimates in this report were produced using PowerStats, a web-based software application that enables users to generate estimates from data from many NCES studies. PowerStats can use replicate weights produced with BRR, jackknifing, or bootstrapping to generate the design-adjusted standard errors necessary for testing the statistical significance of differences in the estimates. PowerStats also describes how each variable was created and includes question wording for variables based on specific survey items. With PowerStats, users can replicate or expand upon the tables presented in this report.

The output from PowerStats includes the estimates (e.g., percentages, centiles, or means), their design-adjusted standard errors, and their weighted sample sizes. If the number of valid cases is too small to produce a reliable estimate (i.e., fewer than 30 cases, unweighted), PowerStats produces the double dagger symbol (‡) instead of the estimate.

In addition to producing percentages, centiles, or means, PowerStats users may conduct linear or logistic regressions. Many options for output of regression results are available. For a description of these options, visit the PowerStats website at https://nces.ed.gov/datalab/index.aspx. For more information, contact nces.info@ed.gov.