

High School Longitudinal Study of 2009 (HSLS:09)

A First Look at the Postsecondary Transcripts and
Student Financial Aid Records of Fall 2009 Ninth-Graders



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Introduction

This First Look report presents selected findings from the Postsecondary Education Transcript Study and Student Financial Aid Records Collection (PETS-SR) 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 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' educational and social experiences in high school and their plans for and experiences in postsecondary education, work, and life.

The HSLs:09 base-year data collection occurred in 2009, with follow-up surveys in 2012, 2013, and 2016, including a high school transcript collection in 2013. Between spring 2017 and fall 2018, as part of PETS-SR, all postsecondary institutions that sample members had attended were asked to provide transcripts for the sample members and complete the Student Records instrument. The postsecondary transcript data provide coursetaking information for the 2009 ninth-grade cohort members who enrolled in postsecondary education, allowing for detailed analyses of students' postsecondary coursetaking, credit accumulation (including college credits earned through dual or concurrent enrollment while in high school), academic performance, and degree completion. The student records data provide financial aid information for the 2009 ninth-grade cohort members who enrolled in postsecondary education after high school, allowing researchers to analyze price of attendance, tuition and fees, and various types of financial aid students received from their first academic year in postsecondary education through the 2016–17 academic year.

The purpose of this report is to illustrate the range of information available in the PETS-SR data. The selected findings present examples of the estimates that can be obtained from the data and are not intended to address any particular issue. Tables 1a–3b of this report present results from the PETS collection, focusing on students' coursetaking experiences through June 2016 using the subsample of fall 2009 ninth-graders whose first postsecondary enrollment after high school was in the 2013–14 academic year. Limiting the estimates to students who began their postsecondary education in the same academic year ensures that outcomes are observed over the

same time frame across the sample.¹ Tables 4a–6 present results from student records collected for fall 2009 ninth-graders who enrolled in postsecondary education after high school. These tables focus on tuition and fees students were charged and the various types of financial aid they received while enrolled at their first primary institution during their first academic year.² Although most (80 percent) of fall 2009 ninth-graders with postsecondary enrollment after high school began their postsecondary education in the 2013–14 academic year (see the distribution of students by first academic year enrolled in postsecondary education in table C-1 in appendix C), tables 4a–6 include all those who started in academic years 2011–12 through 2016–17.

The report provides estimates for the total population and by selected demographic and enrollment characteristics. All estimates have been weighted to reflect the sample design and to account for nonresponse. This report is descriptive in nature; therefore, causal inferences should not be drawn from the results presented. Many of the variables examined in this report may be related to one another, but these analyses do not account for such relationships.

Appendix A contains standard errors for all estimates in this report. Appendix B describes the variables used to generate these estimates. Appendix C provides detailed technical information on such aspects of HSLs:09 as its data collection instruments, sample design, and response rates. Readers may find additional information about the HSLs:09 dataset and the methods employed in collecting and processing the data in *High School Longitudinal Study of 2009 (HSLs:09) Postsecondary Education Transcript Study and Student Financial Aid Records Collection Data File Documentation* (Duprey et al. forthcoming).

¹ Tables 1a–3b include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

² Unlike the PETS outcomes, which are measured over time, the SR outcomes are measured within one academic year. This report focuses on students' financial aid awards in their first academic year, regardless of the calendar year in which they started their postsecondary education. The first primary institution is generally the institution in which a student first enrolled at the postsecondary level. For students who enrolled at one institution during the summer immediately after high school and enrolled at another institution during the fall, their first primary institution is the institution with the fall enrollment. Students' first primary institutions in SR tables were determined based on enrollment data in both transcripts and student records. These institutions may differ from students' first known institutions shown in PETS tables, which were determined based only on enrollment data in transcripts. Academic years are defined as running from July 1 through June 30. The first academic year is generally the earliest academic year in which a student was enrolled at his or her first primary institution. For students who first enrolled in a postsecondary institution in the last 2 months of an academic year and then enrolled the following fall, their first academic year is the academic year of the fall enrollment.

Selected Findings

For fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, postsecondary transcript data indicate that...

- 41 percent had taken one or more remedial courses as of June 2016 (table 1a). These students took an average of three remedial courses and passed an average of two of them during this period.
- they had attempted an average of 69 undergraduate credits and earned an average of 62 undergraduate credits as of June 2016 (table 2a). Their mean overall grade point average (GPA) was 2.7.
- 91 percent had attempted some STEM credits as of June 2016 (table 3a).³ Students who had attempted any STEM credits attempted an average of 22 STEM credits, earned an average of 19 STEM credits, and had a mean STEM GPA of 2.4.

For fall 2009 ninth-graders who enrolled in postsecondary education after high school, student records data indicate that, during their first academic year in postsecondary education,...

- 70 percent received an average of \$8,100 in federal Title IV aid, 34 percent received an average of \$2,900 in state aid, and 40 percent received an average of \$9,500 in institutional aid at their primary institution (table 4a).
- 59 percent received an average of \$6,500 in need-based grants at their primary institution, including 46 percent who received an average of \$4,000 through the federal Pell Grant program⁴ (table 5). Twenty-eight percent received an average of \$7,300 in merit-based grant aid from state and/or institutional sources. Thirty-three percent received an average of \$2,900 in state grants (need- and non-need-based), and 40 percent received an average of \$9,400 in institutional grants (need- and non-need-based).
- 45 percent took out federal, state, or institutional loans to pay for their education at their primary institution (table 6). These student borrowers took out an average of \$5,600 in loans to attend that institution that year.

³ In this report, STEM classification is based on the National Science and Mathematics Access to Retain Talent (SMART) Grant Program. More information about SMART is available at <https://www2.ed.gov/programs/smart/index.html>.

⁴ The federal Pell Grant program is the largest federal need-based grant program available to undergraduate students.

Tables

Table 1a. REMEDIAL COURSEWORK: Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who took one or more remedial courses and, among those students, average number of remedial courses taken and passed, by demographic and high school characteristics: June 2016

Demographic and high school characteristics	Percent who took one or more remedial courses	Among those who took one or more remedial courses	
		Average number of courses taken	Average number of courses passed
Total	40.9	2.5	1.7
Sex			
Female	41.2	2.5	1.7
Male	40.6	2.5	1.6
Race/ethnicity ¹			
White	34.0	2.1	1.5
Black	57.3	2.9	1.8
Hispanic	52.5	3.0	2.0
Asian	32.3	2.5	1.7
Other or Two or more races	39.6	2.4	1.5
Highest education attained by either parent			
High school credential or lower ²	49.0	2.7	1.8
Certificate or associate's degree ³	47.3	2.5	1.6
Bachelor's or higher degree	31.7	2.3	1.6
Mathematics achievement quintile in 11th grade ⁴			
Lowest fifth	67.1	3.2	1.8
Middle three-fifths	46.8	2.5	1.7
Highest fifth	16.5	1.6	1.2
Cumulative high school grade point average			
Lower than 2.50	62.5	3.0	1.7
2.50–2.99	48.5	2.5	1.8
3.00–3.49	34.2	2.0	1.5
3.50 or higher	17.7	1.5	1.2

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 persons having origins in more than one race. Race categories exclude persons of Hispanic origin.

² High school credential includes high school diploma, GED certificate, certificate of attendance or completion, or other high school equivalency credential.

³ Certificate or associate's degree includes certificate/diploma from school providing occupational training or associate's degree programs.

⁴ The mathematics assessment was designed to provide a measure of student achievement in algebraic reasoning. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HSL:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

NOTE: Remedial courses are precollege-level courses provided by postsecondary institutions to help academically underprepared students succeed in college-level courses. Estimates include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 1b. REMEDIAL COURSEWORK: Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who took one or more remedial courses and, among those students, average number of remedial courses taken and passed, by postsecondary enrollment characteristics: June 2016

Postsecondary enrollment characteristics	Percent who took one or more remedial courses	Among those who took one or more remedial courses	
		Average number of courses taken	Average number of courses passed
Total	40.9	2.5	1.7
Control and level of first institution ¹			
Public 2-year	59.8	2.9	1.8
Public 4-year	32.1	2.0	1.5
Private nonprofit 4-year	23.8	1.8	1.2
Private for-profit less-than-2-year	‡	‡	‡
Private for-profit 2-year	24.9 !	‡	‡
Private for-profit 4-year	34.3	2.9	1.4
Other ²	29.3 !	‡	‡
Selectivity and level of first institution ¹			
Highly selective, 4-year	11.9	1.5	1.2
Moderately selective, 4-year	29.6	1.9	1.4
Inclusive, 4-year	47.3	2.0	1.4
Selectivity not classified, less-than-2-year	‡	‡	‡
Selectivity not classified, 2-year	58.7	2.9	1.8
Selectivity not classified, 4-year	50.0	2.6	1.7
Highest postsecondary attainment and persistence status as of June 2016			
No credential, not enrolled	50.7	2.5	1.3
No credential, enrolled at less-than-4-year institution	66.9	3.7	2.5
No credential, enrolled at 4-year institution	26.7	2.0	1.5
Attained undergraduate certificate	29.3	2.3	1.4
Attained associate's degree	51.0	1.9	1.7
Attained bachelor's degree	26.5	‡	‡

! Interpret data with caution. Estimate is unstable because the standard error is between 30 and 50 percent of the estimate.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate, or the standard error is greater than 50 percent of the estimate.

¹ First institution is the first known postsecondary institution attended based on postsecondary transcripts. If a student enrolled in a postsecondary institution exclusively while in high school, that institution was not counted as the first institution.

² Includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year institutions.

NOTE: Remedial courses are precollege-level courses provided by postsecondary institutions to help academically underprepared students succeed in college-level courses. Estimates include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 2a. UNDERGRADUATE CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, average number of undergraduate credits attempted, average number of undergraduate credits earned, and average undergraduate GPA, by demographic and high school characteristics: June 2016

Demographic and high school characteristics	Average number of undergraduate credits attempted	Average number of undergraduate credits earned	Average undergraduate GPA ¹
Total	68.6	61.8	2.7
Sex			
Female	71.2	65.0	2.8
Male	65.7	58.2	2.5
Race/ethnicity ²			
White	73.4	68.3	2.8
Black	57.6	46.1	2.2
Hispanic	61.1	51.8	2.4
Asian	81.0	77.3	2.9
Other or Two or more races	63.1	55.9	2.5
Highest education attained by either parent			
High school credential or lower ³	60.9	52.2	2.5
Certificate or associate's degree ⁴	61.6	53.1	2.5
Bachelor's or higher degree	78.2	73.4	2.9
Mathematics achievement quintile in 11th grade ⁵			
Lowest fifth	45.8	35.1	2.1
Middle three-fifths	65.4	56.9	2.6
Highest fifth	86.0	84.1	3.1
Cumulative high school grade point average			
Lower than 2.50	43.3	31.3	1.9
2.50–2.99	63.5	53.5	2.4
3.00–3.49	77.3	71.6	2.8
3.50 or higher	90.3	90.7	3.3

¹ Estimates based on students with credits earned through June 2016.

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 persons having origins in more than one race. Race categories exclude persons of Hispanic origin.

³ High school credential includes high school diploma, GED certificate, certificate of attendance or completion, or other high school equivalency credential.

⁴ Certificate or associate's degree includes certificate/diploma from school providing occupational training or associate's degree programs.

⁵ The mathematics assessment was designed to provide a measure of student achievement in algebraic reasoning. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HSLs:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

NOTE: The number of credits earned may be higher than the number of credits attempted because Advanced Placement credits were counted as credits earned but not as credits attempted. Estimates include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLs:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 2b. UNDERGRADUATE CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, average number of undergraduate credits attempted, average number of undergraduate credits earned, and average undergraduate GPA, by postsecondary enrollment characteristics: June 2016

Postsecondary enrollment characteristics	Average number of undergraduate credits attempted	Average number of undergraduate credits earned	Average undergraduate GPA ¹
Total	68.6	61.8	2.7
Control and level of first institution ²			
Public 2-year	53.8	43.9	2.3
Public 4-year	79.5	74.0	2.8
Private nonprofit 4-year	80.6	77.1	3.0
Private for-profit less-than-2-year	31.3	30.0	3.0
Private for-profit 2-year	48.8	43.2	2.8
Private for-profit 4-year	51.9	44.5	2.4
Other ³	47.9	45.2	2.9
Selectivity and level of first institution ²			
Highly selective, 4-year	89.9	90.0	3.1
Moderately selective, 4-year	80.7	74.7	2.8
Inclusive, 4-year	69.5	60.8	2.5
Selectivity not classified, less-than-2-year	31.1	29.8	3.0
Selectivity not classified, 2-year	53.7	44.0	2.4
Selectivity not classified, 4-year	59.7	51.6	2.6
Highest postsecondary attainment and persistence status as of June 2016			
No credential, not enrolled	31.9	21.8	2.0
No credential, enrolled at less-than-4-year institution	62.2	47.6	2.3
No credential, enrolled at 4-year institution	94.2	90.8	3.0
Attained undergraduate certificate	50.9	47.2	3.0
Attained associate's degree	87.8	84.3	3.1
Attained bachelor's degree	131.7	134.3	3.5

¹ Estimates based on students with credits earned through June 2016.

² First institution is the first known postsecondary institution attended based on postsecondary transcripts. If a student enrolled in a postsecondary institution exclusively while in high school, that institution was not counted as the first institution.

³ Includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year institutions.

NOTE: The number of credits earned may be higher than the number of credits attempted because Advanced Placement credits were counted as credits earned but not as credits attempted. Estimates include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 3a. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who attempted any STEM credits and, among those students, average number of STEM credits attempted, average number of STEM credits earned, and average STEM GPA, by demographic and high school characteristics: June 2016

Demographic and high school characteristics	Among those who attempted any STEM credits			
	Percent who attempted any STEM credits	Average number of STEM credits attempted	Average number of STEM credits earned	Average STEM GPA
Total	91.0	22.2	18.9	2.4
Sex				
Female	90.4	21.3	18.3	2.5
Male	91.7	23.2	19.5	2.3
Race/ethnicity ¹				
White	92.6	23.4	20.8	2.6
Black	88.2	18.3	13.2	1.8
Hispanic	88.4	19.3	14.7	2.2
Asian	93.9	33.9	30.9	2.7
Other or Two or more races	89.3	19.9	16.7	2.3
Highest education attained by either parent				
High school credential or lower ²	89.5	19.3	15.3	2.2
Certificate or associate's degree ³	88.8	19.3	15.7	2.2
Bachelor's degree or higher	93.6	25.7	22.9	2.6
Mathematics achievement quintile in 11th grade ⁴				
Lowest fifth	84.5	12.9	8.4	1.7
Middle three-fifths	90.6	18.7	14.9	2.2
Highest fifth	95.0	32.9	30.9	2.9
Cumulative high school grade point average				
Lower than 2.50	82.6	13.0	8.0	1.6
2.50–2.99	92.3	18.7	14.3	2.1
3.00–3.49	94.3	23.5	20.3	2.5
3.50 or higher	94.8	32.4	31.5	3.1
Saw self as a math person (2016)				
Agree or strongly agree	91.4	26.8	24.0	2.6
Disagree or strongly disagree	89.9	18.1	14.6	2.3
Saw self as a science person (2016)				
Agree or strongly agree	91.6	28.4	25.2	2.5
Disagree or strongly disagree	89.7	15.5	12.6	2.4

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 persons having origins in more than one race. Race categories exclude persons of Hispanic origin.

² High school credential includes high school diploma, GED certificate, certificate of attendance or completion, or other high school equivalency credential.

³ Certificate or associate's degree includes certificate/diploma from school providing occupational training or associate's degree programs.

⁴ The mathematics assessment was designed to provide a measure of student achievement in algebraic reasoning. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HSL:09) Base-Year to First Follow-Up Data File Documentation (Ingels et al. 2014)*.

NOTE: STEM classification is based on the National Science and Mathematics Access to Retain Talent Grant (National SMART Grant) Program, 34 C.F.R. 691.17(d). Estimates include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Base Year, First Follow-Up, Second Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 3b. SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who attempted any STEM credits and, among those students, average number of STEM credits attempted, average number of STEM credits earned, and average STEM GPA, by postsecondary enrollment characteristics: June 2016

Postsecondary enrollment characteristics	Among those who attempted any STEM credits			
	Percent who attempted any STEM credits	Average number of STEM credits attempted	Average number of STEM credits earned	Average STEM GPA
Total	91.0	22.2	18.9	2.4
Control and level of first institution ¹				
Public 2-year	88.2	17.5	13.1	2.0
Public 4-year	95.7	27.2	24.0	2.5
Private nonprofit 4-year	92.7	21.7	20.1	2.8
Private for-profit less-than-2-year	37.9	‡	‡	‡
Private for-profit 2-year	58.0	11.8	10.4	2.4
Private for-profit 4-year	82.2	11.9	10.0	2.1
Other ²	61.5	‡	‡	‡
Selectivity and level of first institution ¹				
Highly selective, 4-year	96.1	32.9	31.7	2.9
Moderately selective, 4-year	94.8	24.0	21.0	2.5
Inclusive, 4-year	93.2	19.8	15.8	2.3
Selectivity not classified, less-than-2-year	35.2	‡	‡	‡
Selectivity not classified, 2-year	87.4	17.4	13.0	2.1
Selectivity not classified, 4-year	91.1	18.1	14.5	2.3
Major field of study ³				
Computer and information sciences	98.8	41.1	35.6	2.5
Engineering and engineering technology	96.1	55.1	51.8	2.8
Biology and physical science, science technology, mathematics, agriculture, and natural resources	96.2	44.2	40.5	2.7
Health care	92.6	22.5	18.8	2.5
Business	93.1	15.5	13.0	2.6
Education	93.0	14.3	11.7	2.4
Social sciences	95.1	16.2	14.1	2.5
Humanities	90.6	13.0	10.6	2.6
Other ⁴	86.6	14.9	12.4	2.4

‡ Reporting standards not met. Either there are too few cases for a reliable estimate, or the standard error is greater than 50 percent of the estimate.

¹ First institution is the first known postsecondary institution attended based on postsecondary transcripts. If a student enrolled in a postsecondary institution exclusively while in high school, that institution was not counted as the first institution.

² Includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year institutions.

³ Major field of study is self-reported by students and describes the most recent undergraduate degree or certificate program as of February 2016. For respondents with multiple majors, the first-reported major field of study is used.

⁴ "Other" includes basic skills and citizenship activities; leisure and recreational activities; personal awareness and self-improvement; high school/secondary diplomas and certificate programs; interpersonal and social skills; 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.

NOTE: STEM classification is based on the National Science and Mathematics Access to Retain Talent (SMART) Grant Program, 34 C.F.R. 691.17(d). Not all students who declared a major in computer and information sciences; engineering and engineering technology; or biology and physical science, science technology, mathematics, agriculture, and natural resources have attempted STEM credits because the data in the table only capture coursetaking within the first 3 years in college. Estimates include students who took postsecondary courses while still in high school (known as dual or concurrent enrollment) if they also enrolled in postsecondary education after high school and their first postsecondary enrollment after high school was in 2013–14.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HLS:09), Second Follow-Up, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 4a. TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by demographic and high school characteristics

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid ¹		State aid ²		Institutional aid ³	
			Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴
Total	\$11,100	\$3,400	70.1	\$8,100	33.6	\$2,900	40.3	\$9,500
Sex								
Female	11,100	3,300	72.4	8,000	33.5	3,000	41.2	9,400
Male	11,100	3,500	67.5	8,100	33.7	2,800	39.3	9,600
Race/ethnicity ⁵								
White	12,600	4,500	64.2	8,100	30.3	3,000	45.1	9,700
Black	8,800	1,300	86.5	8,900	35.6	3,000	34.7	8,500
Hispanic	8,600	1,900	74.4	7,600	41.3	2,500	32.2	9,200
Asian	13,300	4,600	61.2	7,300	40.0	3,800	43.0	11,900
Other or Two or more races	10,200	2,700	75.7	8,200	28.6	3,400	37.5	8,400
Highest education attained by either parent								
High school credential or lower ⁶	8,400	1,700	80.2	7,400	39.4	2,800	35.8	7,800
Certificate or associate's degree ⁷	9,400	2,100	75.0	8,000	37.4	2,900	35.9	9,200
Bachelor's degree or higher	14,200	5,400	59.0	8,900	28.0	3,200	47.5	10,500
Mathematics achievement quintile in 11th grade ⁸								
Lowest fifth	7,200	2,500	77.0	7,000	29.0	2,300	19.1	5,400
Middle three-fifths	10,000	2,700	72.3	8,300	35.5	2,800	38.2	8,400
Highest fifth	15,800	5,500	60.0	8,400	32.4	3,500	57.4	11,700

See notes at end of table.

Table 4a. TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by demographic and high school characteristics—Continued

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid ¹		State aid ²		Institutional aid ³	
			Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴
Cumulative high school grade point average								
Lower than 2.50	6,300	1,900	77.3	6,700	27.8	2,000	19.2	5,200
2.50–2.99	10,000	2,900	71.0	8,800	35.3	2,600	32.2	8,300
3.00–3.49	12,500	3,700	68.4	8,700	36.2	3,300	47.3	9,900
3.50 or higher	16,400	5,100	63.2	8,600	35.2	3,900	66.0	11,100

¹ Federal Title IV aid includes federal Title IV loans (including federal Direct PLUS Loans to parents), federal Title IV grants, and federal college work-study. It does not include non-Title IV aid from other federal sources such as Public Health Service Loans, Bureau of Indian Affairs Grants, District of Columbia Tuition Assistance Grants, and Iraq and Afghanistan Service Grants. Federal veterans' education benefits and education tax credit and tax deduction benefits are not included either.

² State aid includes state grants; state loans; state-sponsored work-study; and vocational rehabilitation and job training grants, including federal Workforce Investment Act funds. The grants at California public institutions funded by the state but allocated by the institutions (Community College Board of Governors Grants, California State University Grants, and Educational Opportunity Program grants) are also included as state aid.

³ Institutional aid includes institutional grants and fellowships, loans, and work-study assistance funded by the institution attended.

⁴ The amount of selected types of aid received is calculated only for students who received such aid.

⁵ 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 persons having origins in more than one race. Race categories exclude persons of Hispanic origin.

⁶ High school credential includes high school diploma, GED certificate, certificate of attendance or completion, or other high school equivalency credential.

⁷ Certificate or associate's degree includes certificate/diploma from school providing occupational training or associate's degree programs.

⁸ The mathematics assessment was designed to provide a measure of student achievement in algebraic reasoning. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HSL:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

NOTE: The first primary institution is generally the institution in which a student first enrolled at the postsecondary level, according to enrollment data in both transcripts and student records. For students who enrolled at one institution during the summer immediately after high school and enrolled at another institution during the fall, their first primary institution is the institution with the fall enrollment. Academic years are defined as running from July 1 through June 30. The first academic year is generally the earliest academic year in which a student was enrolled at his or her first primary institution. For students who first enrolled in a postsecondary institution in the last 2 months of an academic year and then enrolled the following fall, their first academic year is the academic year of the fall enrollment. The academic year in which fall 2009 ninth-graders first enrolled in postsecondary education after high school varies, ranging from 2011–12 to 2016–17. The estimates pertain to students' first academic year during this time frame.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 4b. TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by postsecondary enrollment characteristics

Postsecondary enrollment characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid ¹		State aid ²		Institutional aid ³	
			Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴
Total	\$11,100	\$3,400	70.1	\$8,100	33.6	\$2,900	40.3	\$9,500
Degree program at first primary institution ⁵								
No certificate or degree	5,600	2,100	36.7	6,300	32.4	2,600	22.9	12,300 !
Undergraduate certificate	7,700	3,800	65.3	6,800	17.0	2,100	12.6	2,600
Associate's degree	3,700	1,000	71.1	5,400	32.5	1,900	16.6	2,700
Bachelor's degree	16,800	4,900	73.8	10,000	36.9	3,600	61.4	10,700
Control and level of first primary institution								
Public 2-year	2,700	800	63.2	4,500	32.1	1,700	11.4	2,000
Public 4-year	9,900	3,400	68.7	8,900	38.9	3,500	47.2	5,700
Private nonprofit 4-year	28,000	7,500	81.8	10,600	31.2	3,700	82.3	16,500
Private for-profit less-than-2-year	14,500	7,100	77.0	9,400	‡	‡	15.5	‡
Private for-profit 2-year	15,400	6,400	79.9	11,400	10.9 !	‡	19.7	‡
Private for-profit 4-year	14,900	2,600	92.6	12,900	21.2 !	‡	57.9	5,300
Other ⁶	7,600	2,100 !	61.8	‡	‡	‡	‡	‡
Selectivity and level of first primary institution								
Highly selective, 4-year	21,600	8,300	62.2	10,100	28.1	4,500	62.7	14,600
Moderately selective, 4-year	14,700	3,700	77.2	9,700	42.0	3,400	61.7	9,200
Inclusive, 4-year	12,000	2,300	81.7	9,800	43.9	3,300	52.5	7,800
Selectivity not classified, less-than-2-year	12,600	6,200	69.2	9,100	‡	‡	13.2	‡
Selectivity not classified, 2-year	3,300	1,100	64.3	5,000	31.3	1,800	12.2	2,500
Selectivity not classified, 4-year	9,700	2,600	76.4	8,700	20.5	2,900	41.9	6,400

See notes at end of table.

Table 4b. TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by postsecondary enrollment characteristics—Continued

Postsecondary enrollment characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid ¹		State aid ²		Institutional aid ³	
			Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴	Percent who received aid	Average amount of aid received ⁴
Attendance intensity at first primary institution ⁷								
Exclusively full time	13,700	4,000	74.4	8,700	34.8	3,200	48.6	10,300
Mixed full time and part time	8,600	2,800	67.0	7,400	35.6	2,700	32.0	8,400
Exclusively part time	2,000	700	51.6	3,900	22.3	1,400	8.1	1,800

! Interpret data with caution. Estimate is unstable because the standard error is between 30 and 50 percent of the estimate.

‡ Reporting standards not met. Either there are too few cases for a reliable estimate, or the standard error is greater than 50 percent of the estimate.

¹ Federal Title IV aid includes federal Title IV loans (including federal Direct PLUS Loans to parents), federal Title IV grants, and federal college work-study. It does not include non-Title IV aid from other federal sources such as Public Health Service Loans, Bureau of Indian Affairs Grants, District of Columbia Tuition Assistance Grants, and Iraq and Afghanistan Service Grants. Federal veterans' education benefits and education tax credit and tax deduction benefits are not included either.

² State aid includes state grants; state loans; state-sponsored work-study; and vocational rehabilitation and job training grants, including federal Workforce Investment Act funds. The grants at California public institutions funded by the state but allocated by the institutions (Community College Board of Governors Grants, California State University Grants, and Educational Opportunity Program grants) are also included as state aid.

³ Institutional aid includes institutional grants and fellowships, loans, and work-study assistance funded by the institution attended.

⁴ The amount of selected types of aid received is calculated only for students who received such aid.

⁵ If a student was enrolled in more than one degree program at the primary institution simultaneously, the highest degree program was used.

⁶ Includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year institutions.

⁷ "Exclusively full time" refers to students who were enrolled full time for all months enrolled at their first primary institution in the first academic year. "Exclusively part time" refers to students who were enrolled part time for all months enrolled at their first primary institution in the first academic year. "Mixed full time and part time" refers to students who were enrolled full time in some months and part time in other months at their first primary institution in the first academic year.

NOTE: The first primary institution is generally the institution in which a student first enrolled at the postsecondary level, according to enrollment data in both transcripts and student records. For students who enrolled at one institution during the summer immediately after high school and enrolled at another institution during the fall, their first primary institution is the institution with the fall enrollment. Academic years are defined as running from July 1 through June 30. The first academic year is generally the earliest academic year in which a student was enrolled at his or her first primary institution. For students who first enrolled in a postsecondary institution in the last 2 months of an academic year and then enrolled the following fall, their first academic year is the academic year of the fall enrollment. The academic year in which fall 2009 ninth-graders first enrolled in postsecondary education after high school varies, ranging from 2011–12 to 2016–17. The estimates pertain to students' first academic year during this time frame.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 5. TUITION AND GRANTS AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional grant aid; percentage receiving various types of grants; and among those students receiving each type of grant, average amount received at first primary institution in first academic year, by demographic and high school characteristics

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional grant aid	Merit-based grants ¹		Need-based grants ²		Federal Pell Grants		State grants ³		Institutional grants ⁴	
			Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵
Total	\$11,100	\$5,500	28.2	\$7,300	59.3	\$6,500	46.2	\$4,000	33.2	\$2,900	40.1	\$9,400
Sex												
Female	11,100	5,400	29.2	7,000	62.0	6,600	48.6	4,000	33.0	2,900	41.1	9,300
Male	11,100	5,600	27.3	7,600	56.2	6,500	43.5	3,900	33.4	2,800	39.1	9,500
Race/ethnicity ⁶												
White	12,600	6,800	34.6	7,300	49.3	6,600	32.9	3,800	30.0	2,900	44.8	9,700
Black	8,800	3,300	24.9	6,800	79.0	6,200	72.8	4,000	35.1	2,900	34.7	8,300
Hispanic	8,600	3,600	18.3	7,500	70.7	6,100	61.0	4,000	40.9	2,500	32.2	9,200
Asian	13,300	5,800	19.9	7,200	57.5	10,900	42.7	4,400	39.9	3,800	42.7	11,800
Other or Two or more races	10,200	4,900	22.0	6,900	64.3	6,500	54.4	4,000	28.5	3,400	37.5	8,400
Highest education attained by either parent												
High school credential or lower ⁷	8,400	3,400	23.5	6,600	71.3	6,000	62.8	4,100	39.0	2,800	35.7	7,800
Certificate or associate's degree ⁸	9,400	4,100	26.0	6,700	64.4	6,400	53.5	3,900	37.2	2,800	35.7	9,100
Bachelor's degree or higher	14,200	7,900	34.1	7,800	46.2	7,500	27.8	3,900	27.6	3,100	47.2	10,500
Mathematics achievement quintile in 11th grade ⁹												
Lowest fifth	7,200	4,200	11.8	4,400	68.4	4,700	60.2	3,800	28.7	2,200	19.1	5,400
Middle three-fifths	10,000	4,900	27.0	6,500	61.2	6,200	49.4	4,000	35.1	2,800	38.0	8,400
Highest fifth	15,800	7,700	40.7	8,700	48.2	9,100	28.4	4,100	32.1	3,500	57.0	11,600

See notes at end of table.

Table 5. TUITION AND GRANTS AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional grant aid; percentage receiving various types of grants; and among those students receiving each type of grant, average amount received at first primary institution in first academic year, by demographic and high school characteristics—Continued

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional grant aid	Merit-based grants ¹		Need-based grants ²		Federal Pell Grants		State grants ³		Institutional grants ⁴	
			Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵	Percent who received grants	Average amount of grants received ⁵
Cumulative high school grade point average												
Lower than 2.50	6,300	3,600	9.5	4,900	69.5	4,300	63.0	3,500	27.5	1,900	19.1	5,100
2.50–2.99	10,000	5,300	23.3	7,000	58.0	6,100	47.7	4,200	35.2	2,600	32.2	8,300
3.00–3.49	12,500	6,000	35.9	6,900	55.4	7,600	39.3	4,300	35.9	3,200	47.0	9,900
3.50 or higher	16,400	7,400	48.7	8,200	52.5	9,200	31.9	4,200	34.5	3,700	65.6	11,100

¹ Merit-based grants include state merit-only grants and scholarships and institutional merit-only grants and scholarships, including athletic scholarships.

² Need-based grants include federal Pell Grants, federal Supplemental Educational Opportunity Grants, state need-based grants, and institutional need-based grants. The state and institutional need-based grants may include need-based grants that have a merit consideration.

³ State grants include state need- and non-need-based grants and the federal matching funds to states through the Leveraging Education Assistance Partnership program.

⁴ Institutional grants include need- and non-need-based grants funded by the institution attended.

⁵ The amount of selected types of grants received is calculated only for students who received such grants.

⁶ 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 persons having origins in more than one race. Race categories exclude persons of Hispanic origin.

⁷ High school credential includes high school diploma, GED certificate, certificate of attendance or completion, or other high school equivalency credential.

⁸ Certificate or associate's degree includes certificate/diploma from school providing occupational training or associate's degree programs.

⁹ The mathematics assessment was designed to provide a measure of student achievement in algebraic reasoning. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HLS:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

NOTE: The first primary institution is generally the institution in which a student first enrolled at the postsecondary level, according to enrollment data in both transcripts and student records. For students who enrolled at one institution during the summer immediately after high school and enrolled at another institution during the fall, their first primary institution is the institution with the fall enrollment. Academic years are defined as running from July 1 through June 30. The first academic year is generally the earliest academic year in which a student was enrolled at his or her first primary institution. For students who first enrolled in a postsecondary institution in the last 2 months of an academic year and then enrolled the following fall, their first academic year is the academic year of the fall enrollment. The academic year in which fall 2009 ninth-graders first enrolled in postsecondary education after high school varies, ranging from 2011–12 to 2016–17. The estimates pertain to students' first academic year during this time frame.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HLS:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table 6. LOANS AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, percentage receiving various types of loans and, among those students receiving each type of loan, average amount received at first primary institution in first academic year, by demographic and high school characteristics

Demographic and high school characteristics	Federal, state, and institutional loans ¹		Federal Direct Loans ²		Federal Direct PLUS Loans to parents ³	
	Percent who received loans	Average amount of loans received ⁴	Percent who received loans	Average amount of loans received ⁴	Percent who received loans	Average amount of loans received ⁴
Total	45.2	\$5,600	44.9	\$5,400	7.7	\$13,300
Sex						
Female	46.8	5,700	46.5	5,400	7.7	12,100
Male	43.5	5,600	43.1	5,400	7.6	14,700
Race/ethnicity ⁵						
White	46.6	5,500	46.2	5,200	8.2	13,600
Black	57.4	5,900	57.3	5,700	7.1	13,400
Hispanic	38.3	5,800	38.0	5,500	5.8	12,900
Asian	27.4	5,000	27.2	4,600	6.9	12,700
Other or Two or more races	43.6	5,800	43.3	5,600	9.9	12,300
Highest education attained by either parent						
High school credential or lower ⁶	44.3	5,600	44.2	5,400	6.2	10,900
Certificate or associate's degree ⁷	46.4	5,800	46.2	5,600	7.2	12,800
Bachelor's degree or higher	45.4	5,700	44.9	5,400	9.2	14,500
Mathematics achievement quintile in 11th grade ⁸						
Lowest fifth	38.5	6,200	38.5	6,100	3.9	14,200
Middle three-fifths	46.9	5,700	46.6	5,400	8.4	12,900
Highest fifth	44.5	5,600	43.9	5,200	8.0	13,600
Cumulative high school grade point average						
Lower than 2.50	38.7	5,300	38.5	5,200	5.4	13,900
2.50–2.99	47.7	6,000	47.7	5,800	8.4	13,200
3.00–3.49	48.8	5,700	48.6	5,400	9.0	13,300
3.50 or higher	47.5	5,500	46.7	5,100	8.2	13,500

¹ Private commercial or alternative loans and federal Direct PLUS Loans to parents are not included.

² Federal Direct Loans includes federal Direct Subsidized and Unsubsidized Loans. Students may receive both subsidized and unsubsidized loans. Subsidized loans are awarded on the basis of need, and students are not charged interest on such loans while they are enrolled.

³ Federal Direct PLUS Loans to parents are available to the parents of dependent students and are not based on need.

⁴ The amount of selected types of loans received is calculated only for students who received such loans.

⁵ 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 persons having origins in more than one race. Race categories exclude persons of Hispanic origin.

⁶ High school credential includes high school diploma, GED certificate, certificate of attendance or completion, or other high school equivalency credential.

⁷ Certificate or associate's degree includes certificate/diploma from school providing occupational training or associate's degree programs.

⁸ The mathematics assessment was designed to provide a measure of student achievement in algebraic reasoning. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HSL:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

NOTE: The first primary institution is generally the institution in which a student first enrolled at the postsecondary level, according to enrollment data in both transcripts and student records. For students who enrolled at one institution during the summer immediately after high school and enrolled at another institution during the fall, their first primary institution is the institution with the fall enrollment. Academic years are defined as running from July 1 through June 30. The first academic year is generally the earliest academic year in which a student was enrolled at his or her first primary institution. For students who first enrolled in a postsecondary institution in the last 2 months of an academic year and then enrolled the following fall, their first academic year is the academic year of the fall enrollment. The academic year in which fall 2009 ninth-graders first enrolled in postsecondary education after high school varies, ranging from 2011–12 to 2016–17. The estimates pertain to students' first academic year during this time frame.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

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Appendix A—Standard Error Tables

Table A-1a. Standard errors for table 1a: REMEDIAL COURSEWORK: Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who took one or more remedial courses and, among those students, average number of remedial courses taken and passed, by demographic and high school characteristics: June 2016

Demographic and high school characteristics	Percent who took one or more remedial courses	Among those who took one or more remedial courses	
		Average number of courses taken	Average number of courses passed
Total	1.32	0.07	0.06
Sex			
Female	1.45	0.08	0.06
Male	1.71	0.12	0.09
Race/ethnicity			
White	1.18	0.07	0.05
Black	2.97	0.15	0.11
Hispanic	3.58	0.18	0.15
Asian	4.04	0.24	0.17
Other or Two or more races	2.42	0.15	0.11
Highest education attained by either parent			
High school credential or lower	2.42	0.14	0.10
Certificate or associate's degree	1.90	0.14	0.13
Bachelor's or higher degree	1.40	0.11	0.08
Mathematics achievement quintile in 11th grade			
Lowest fifth	3.06	0.23	0.15
Middle three-fifths	1.55	0.09	0.07
Highest fifth	1.45	0.08	0.07
Cumulative high school grade point average			
Lower than 2.50	2.64	0.16	0.11
2.50–2.99	2.36	0.12	0.11
3.00–3.49	1.79	0.09	0.07
3.50 or higher	1.64	0.07	0.06

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-1b. Standard errors for table 1b: REMEDIAL COURSEWORK: Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who took one or more remedial courses and, among those students, average number of remedial courses taken and passed, by postsecondary enrollment characteristics: June 2016

Postsecondary enrollment characteristics	Percent who took one or more remedial courses	Among those who took one or more remedial courses	
		Average number of courses taken	Average number of courses passed
Total	1.32	0.07	0.06
Control and level of first institution			
Public 2-year	2.24	0.12	0.09
Public 4-year	1.48	0.07	0.05
Private nonprofit 4-year	1.92	0.11	0.09
Private for-profit less-than-2-year	†	†	†
Private for-profit 2-year	8.43	†	†
Private for-profit 4-year	7.11	0.43	0.19
Other	14.21	†	†
Selectivity and level of first institution			
Highly selective, 4-year	1.48	0.09	0.09
Moderately selective, 4-year	1.51	0.08	0.07
Inclusive, 4-year	2.74	0.12	0.11
Selectivity not classified, less-than-2-year	†	†	†
Selectivity not classified, 2-year	2.16	0.11	0.09
Selectivity not classified, 4-year	3.40	0.14	0.10
Highest postsecondary attainment and persistence status as of June 2016			
No credential, not enrolled	2.04	0.11	0.08
No credential, enrolled at less-than-4-year institution	2.91	0.25	0.21
No credential, enrolled at 4-year institution	1.12	0.06	0.05
Attained undergraduate certificate	4.39	0.30	0.16
Attained associate's degree	3.73	0.11	0.11
Attained bachelor's degree	6.48	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLs:09), Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-2a. Standard errors for table 2a: UNDERGRADUATE CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, average number of undergraduate credits attempted, average number of undergraduate credits earned, and average undergraduate GPA, by demographic and high school characteristics: June 2016

Demographic and high school characteristics	Average number of undergraduate credits attempted	Average number of undergraduate credits earned	Average undergraduate GPA
Total	0.85	0.92	0.02
Sex			
Female	1.01	1.10	0.02
Male	1.19	1.27	0.03
Race/ethnicity			
White	0.86	0.94	0.02
Black	2.48	2.39	0.05
Hispanic	2.05	2.11	0.05
Asian	2.32	2.71	0.04
Other or Two or more races	2.25	2.42	0.06
Highest education attained by either parent			
High school credential or lower	1.45	1.55	0.04
Certificate or associate's degree	1.32	1.42	0.04
Bachelor's or higher degree	1.00	1.09	0.02
Mathematics achievement quintile in 11th grade			
Lowest fifth	1.95	2.07	0.07
Middle three-fifths	0.91	0.97	0.02
Highest fifth	1.15	1.19	0.02
Cumulative high school grade point average			
Lower than 2.50	1.36	1.33	0.04
2.50–2.99	1.17	1.23	0.03
3.00–3.49	1.23	1.41	0.03
3.50 or higher	1.17	1.28	0.02

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLs:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-2b. Standard errors for table 2b: UNDERGRADUATE CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, average number of undergraduate credits attempted, average number of undergraduate credits earned, and average undergraduate GPA, by postsecondary enrollment characteristics: June 2016

Postsecondary enrollment characteristics	Average number of undergraduate credits attempted	Average number of undergraduate credits earned	Average undergraduate GPA
Total	0.85	0.92	0.02
Control and level of first institution			
Public 2-year	1.13	1.16	0.03
Public 4-year	1.25	1.31	0.02
Private nonprofit 4-year	1.37	1.69	0.03
Private for-profit less-than-2-year	2.60	2.76	0.17
Private for-profit 2-year	4.76	4.69	0.16
Private for-profit 4-year	6.13	6.19	0.16
Other	7.23	7.41	0.31
Selectivity and level of first institution			
Highly selective, 4-year	1.08	1.28	0.03
Moderately selective, 4-year	0.95	1.19	0.02
Inclusive, 4-year	3.38	3.05	0.05
Selectivity not classified, less-than-2-year	2.75	2.79	0.16
Selectivity not classified, 2-year	1.09	1.13	0.03
Selectivity not classified, 4-year	1.83	1.85	0.05
Highest postsecondary attainment and persistence status as of June 2016			
No credential, not enrolled	0.73	0.68	0.04
No credential, enrolled at less-than-4-year institution	1.36	1.43	0.05
No credential, enrolled at 4-year institution	0.55	0.65	0.02
Attained undergraduate certificate	2.69	2.60	0.07
Attained associate's degree	1.32	1.28	0.03
Attained bachelor's degree	5.59	4.64	0.04

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-3a. Standard errors for table 3a: SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who attempted any STEM credits and, among those students, average number of STEM credits attempted, average number of STEM credits earned, and average STEM GPA, by demographic and high school characteristics: June 2016

Demographic and high school characteristics	Among those who attempted any STEM credits			
	Percent who attempted any STEM credits	Average number of STEM credits attempted	Average number of STEM credits earned	Average STEM GPA
Total	0.62	0.44	0.44	0.02
Sex				
Female	0.84	0.53	0.53	0.03
Male	0.86	0.59	0.60	0.04
Race/ethnicity				
White	0.63	0.50	0.50	0.02
Black	1.91	1.10	0.97	0.07
Hispanic	1.79	0.88	0.79	0.07
Asian	1.78	1.44	1.54	0.05
Other or Two or more races	1.43	1.25	1.20	0.07
Highest education attained by either parent				
High school credential or lower	1.11	0.67	0.66	0.05
Certificate or associate's degree	1.63	0.62	0.65	0.05
Bachelor's degree or higher	0.76	0.60	0.59	0.03
Mathematics achievement quintile in 11th grade				
Lowest fifth	2.52	0.92	0.77	0.11
Middle three-fifths	0.88	0.33	0.36	0.03
Highest fifth	0.67	0.86	0.83	0.03
Cumulative high school grade point average				
Lower than 2.50	1.66	0.46	0.46	0.06
2.50–2.99	0.95	0.50	0.49	0.04
3.00–3.49	0.72	0.73	0.74	0.04
3.50 or higher	0.77	0.88	0.86	0.03
Saw self as a math person (2016)				
Agree or strongly agree	0.88	0.58	0.59	0.03
Disagree or strongly disagree	1.10	0.58	0.54	0.04
Saw self as a science person (2016)				
Agree or strongly agree	0.87	0.70	0.68	0.03
Disagree or strongly disagree	0.96	0.40	0.36	0.04

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Base Year, First Follow-Up, Second Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-3b. Standard errors for table 3b: SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) CREDITS AND GRADE POINT AVERAGE (GPA): Among fall 2009 ninth-graders whose first postsecondary enrollment after high school was in 2013–14, percentage who attempted any STEM credits and, among those students, average number of STEM credits attempted, average number of STEM credits earned, and average STEM GPA, by postsecondary enrollment characteristics: June 2016

Postsecondary enrollment characteristics	Among those who attempted any STEM credits			
	Percent who attempted any STEM credits	Average number of STEM credits attempted	Average number of STEM credits earned	Average STEM GPA
Total	0.62	0.44	0.44	0.02
Control and level of first institution				
Public 2-year	1.14	0.49	0.51	0.04
Public 4-year	0.58	0.74	0.69	0.03
Private nonprofit 4-year	0.99	0.70	0.74	0.04
Private for-profit less-than-2-year	10.24	†	†	†
Private for-profit 2-year	10.39	1.61	1.48	0.20
Private for-profit 4-year	6.27	2.33	2.23	0.23
Other	14.08	†	†	†
Selectivity and level of first institution				
Highly selective, 4-year	0.68	1.00	1.01	0.03
Moderately selective, 4-year	0.76	0.62	0.62	0.03
Inclusive, 4-year	1.70	1.66	1.30	0.06
Selectivity not classified, less-than-2-year	9.47	†	†	†
Selectivity not classified, 2-year	1.15	0.48	0.50	0.04
Selectivity not classified, 4-year	1.85	0.92	0.89	0.08
Major field of study				
Computer and information sciences	0.76	2.48	2.69	0.10
Engineering and engineering technology	1.35	2.31	2.56	0.09
Biology and physical science, science technology, mathematics, agriculture, and natural resources	1.81	1.33	1.25	0.05
Health care	1.92	0.69	0.80	0.05
Business	1.38	0.44	0.41	0.06
Education	1.75	0.80	0.97	0.15
Social sciences	1.10	0.70	0.65	0.07
Humanities	2.33	0.81	0.49	0.10
Other	1.68	0.58	0.57	0.05

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Second Follow-Up, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-4a. Standard errors for table 4a: TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by demographic and high school characteristics

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid		State aid		Institutional aid	
			Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received
Total	\$290	\$170	1.00	\$170	1.49	\$110	1.22	\$290
Sex								
Female	350	210	1.13	230	1.79	130	1.55	350
Male	360	210	1.51	240	1.85	150	1.54	440
Race/ethnicity								
White	370	210	1.22	180	1.31	120	1.30	340
Black	650	190	2.14	500	3.82	240	3.49	1,100
Hispanic	580	310	2.63	390	3.55	200	2.88	1,360
Asian	1,290	720	4.51	660	4.32	510	4.31	1,780
Other or Two or more races	760	420	2.60	710	2.84	410	2.91	780
Highest education attained by either parent								
High school credential or lower	410	210	1.41	250	2.87	150	2.07	790
Certificate or associate's degree	440	170	1.61	310	2.10	180	2.01	670
Bachelor's degree or higher	490	280	1.67	270	1.50	170	1.69	370
Mathematics achievement quintile in 11th grade								
Lowest fifth	600	510	2.45	470	3.04	270	2.73	710
Middle three-fifths	330	170	1.25	240	1.93	110	1.39	330
Highest fifth	530	330	1.95	300	2.06	230	2.08	570

See notes at end of table.

Table A-4a. Standard errors for table 4a: TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by demographic and high school characteristics—Continued

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid		State aid		Institutional aid	
			Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received
Cumulative high school grade point average								
Lower than 2.50	410	280	2.04	350	2.57	170	1.81	640
2.50–2.99	480	250	1.82	300	2.70	160	2.03	570
3.00–3.49	410	270	1.66	280	1.98	190	2.00	740
3.50 or higher	550	310	1.99	290	2.12	220	1.95	520

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLs:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-4b. Standard errors for table 4b: TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by postsecondary enrollment characteristics

Postsecondary enrollment characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid		State aid		Institutional aid	
			Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received
Total	\$290	\$170	1.00	\$170	1.49	\$110	1.22	\$290
Degree program at first primary institution								
No certificate or degree	930	410	4.34	740	9.54	520	5.63	4,770
Undergraduate certificate	720	530	4.51	450	3.09	320	2.41	730
Associate's degree	200	110	1.74	210	2.39	130	1.60	370
Bachelor's degree	410	260	1.29	210	1.52	140	1.56	330
Control and level of first primary institution								
Public 2-year	90	60	2.13	130	2.53	100	1.59	390
Public 4-year	260	190	1.43	200	1.78	150	1.53	230
Private nonprofit 4-year	680	550	1.49	380	2.47	230	2.37	640
Private for-profit less-than-2-year	1,920	1,970	5.38	1,320	†	†	4.42	†
Private for-profit 2-year	1,160	970	5.92	1,320	4.76	†	5.83	†
Private for-profit 4-year	1,200	630	3.28	1,440	6.39	†	6.67	1,080
Other	1,920	620	16.32	†	†	†	†	†
Selectivity and level of first primary institution								
Highly selective, 4-year	710	580	2.19	390	2.15	320	1.93	660
Moderately selective, 4-year	430	230	1.52	240	1.84	140	2.26	460
Inclusive, 4-year	730	290	2.49	540	3.77	230	4.04	520
Selectivity not classified, less-than-2-year	1,940	1,710	7.16	1,260	†	†	3.79	†
Selectivity not classified, 2-year	160	100	2.01	170	2.46	110	1.48	440
Selectivity not classified, 4-year	690	360	2.92	670	2.72	360	3.65	660

See notes at end of table.

Table A-4b. Standard errors for table 4b: TUITION AND FINANCIAL AID AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional aid; percentage receiving financial aid from various sources; and among those students receiving aid from each source, average amount received at first primary institution in first academic year, by postsecondary enrollment characteristics—Continued

Postsecondary enrollment characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional aid	Federal Title IV aid		State aid		Institutional aid	
			Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received	Percent who received aid	Average amount of aid received
Attendance intensity at first primary institution								
Exclusively full time	330	200	1.08	200	1.68	130	1.62	320
Mixed full time and part time	490	290	2.28	360	2.88	180	2.47	770
Exclusively part time	200	90	3.21	420	3.86	240	1.77	520

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-5. Standard errors for table 5: TUITION AND GRANTS AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional grant aid; percentage receiving various types of grants; and among those students receiving each type of grant, average amount received at first primary institution in first academic year, by demographic and high school characteristics

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional grant aid	Merit-based grants		Need-based grants		Federal Pell Grants		State grants		Institutional grants	
			Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received
Total	\$290	\$210	1.10	\$220	0.93	\$200	1.24	\$60	1.49	\$100	1.23	\$300
Sex												
Female	350	270	1.25	270	1.32	250	1.60	70	1.79	130	1.56	360
Male	360	260	1.38	410	1.54	250	1.51	80	1.84	140	1.55	450
Race/ethnicity												
White	370	250	1.42	240	1.11	230	1.11	70	1.32	110	1.31	340
Black	650	340	2.78	770	2.62	440	3.29	150	3.79	230	3.49	1,080
Hispanic	580	460	2.19	820	2.38	340	3.00	110	3.56	190	2.88	1,370
Asian	1,290	710	4.12	900	4.33	1,320	4.61	180	4.32	510	4.29	1,790
Other or Two or more races	760	600	2.78	680	3.36	450	3.78	200	2.84	400	2.91	780
Highest education attained by either parent												
High school credential or lower	410	310	1.65	610	1.68	210	2.12	80	2.86	150	2.08	790
Certificate or associate's degree	440	280	1.89	460	1.78	360	2.19	140	2.11	160	2.01	650
Bachelor's degree or higher	490	320	1.70	240	1.47	370	1.42	100	1.51	160	1.69	380
Mathematics achievement quintile in 11th grade												
Lowest fifth	600	640	2.01	750	2.93	320	3.42	150	3.04	260	2.73	710
Middle three-fifths	330	240	1.25	280	1.18	210	1.54	70	1.95	110	1.40	330
Highest fifth	530	350	2.26	450	2.00	520	1.80	120	2.07	230	2.13	590

See notes at end of table.

Table A-5. Standard errors for table 5: TUITION AND GRANTS AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, average tuition and fees; average tuition and fees minus federal Title IV, state, and institutional grant aid; percentage receiving various types of grants; and among those students receiving each type of grant, average amount received at first primary institution in first academic year, by demographic and high school characteristics—Continued

Demographic and high school characteristics	Average tuition and fees	Average tuition and fees minus federal Title IV, state, and institutional grant aid	Merit-based grants		Need-based grants		Federal Pell Grants		State grants		Institutional grants	
			Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received	Percent who received grants	Average amount of grants received
Cumulative high school grade point average												
Lower than 2.50	410	360	1.16	580	1.71	180	2.42	100	2.57	160	1.80	640
2.50–2.99	480	350	1.80	520	1.93	260	2.12	100	2.69	160	2.03	570
3.00–3.49	410	300	2.15	390	1.74	360	1.90	100	1.99	180	2.00	750
3.50 or higher	550	340	2.17	360	2.03	510	2.12	120	2.14	200	1.96	540

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HLS:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Table A-6. Standard errors for table 6: LOANS AT FIRST PRIMARY INSTITUTION: Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, percentage receiving various types of loans and, among those students receiving each type of loan, average amount received at first primary institution in first academic year, by demographic and high school characteristics

Demographic and high school characteristics	Federal, state, and institutional loans		Federal Direct Loans		Federal Direct PLUS Loans to parents	
	Percent who received loans	Average amount of loans received	Percent who received loans	Average amount of loans received	Percent who received loans	Average amount of loans received
Total	1.19	\$80	1.19	\$80	0.52	\$620
Sex						
Female	1.49	100	1.49	100	0.78	790
Male	1.70	130	1.72	130	0.67	1,020
Race/ethnicity						
White	1.23	80	1.24	60	0.54	640
Black	3.95	240	3.94	230	1.45	1,810
Hispanic	3.08	310	3.07	280	1.16	1,800
Asian	3.18	240	3.15	230	1.75	2,630
Other or Two or more races	3.72	270	3.73	260	2.17	3,290
Highest education attained by either parent						
High school credential or lower	1.92	180	1.92	170	0.89	1,060
Certificate or associate's degree	1.93	200	1.92	190	0.98	1,040
Bachelor's degree or higher	1.56	110	1.56	90	0.77	890
Mathematics achievement quintile in 11th grade						
Lowest fifth	2.99	390	2.99	390	1.03	2,470
Middle three-fifths	1.74	110	1.72	100	0.77	740
Highest fifth	2.09	120	2.09	100	0.80	930
Cumulative high school grade point average						
Lower than 2.50	2.51	240	2.52	240	0.82	2,070
2.50–2.99	2.21	170	2.21	170	1.18	1,570
3.00–3.49	1.77	130	1.77	110	1.11	880
3.50 or higher	2.18	110	2.23	100	0.90	1,040

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLs:09), Base Year, First Follow-Up, High School Transcript Study, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

Appendix B—Analysis Variables

Academic year of first postsecondary enrollment after high school **X5POSTHSAY**

This variable applies to postsecondary transcript respondents and indicates the academic year of first postsecondary enrollment after high school completion or exit. An academic year is defined as running from July 1 through June 30. The value of this variable represents the last year of an academic year. For example, the value of 2012 indicates the 2011–12 academic year. In this report, this variable was used as a filter to select the sample of students whose first postsecondary enrollment after high school completion or exit was in the 2013–14 academic year (i.e., X5POSTHSAY=2014).

Attendance intensity at first primary institution **X5PFYENRLSTAT**

This variable applies to student record respondents and indicates students' enrollment intensity at their primary institution during the first academic year in postsecondary education after high school completion or exit. The variable was derived based on term dates and enrollment statuses as reported by institutions. Institutions indicated whether a student was enrolled full time, three-fourths time, half time, or less than half time. For this variable, all categories less than full time are considered part time. "Exclusively full time" refers to students who were enrolled full time for all months enrolled at their first primary institution in the first academic year. "Exclusively part time" refers to students who were enrolled part time for all months enrolled at their first primary institution in the first academic year. "Mixed full time and part time" refers to students who were enrolled full time in some months and part time in other months at their first primary institution in the first academic year.

Control and level of first known postsecondary institution **X5PS1SEC**

This variable applies to postsecondary transcript respondents and indicates the control and level of the first known postsecondary institution attended. Students' first known postsecondary institutions were identified based on enrollment data in transcripts. Enrollment at an institution exclusively while in high school is not considered first enrollment. The original 12 categories of this variable were recoded into the following seven categories in this report: public 2-year, public 4-year, private nonprofit 4-year, private for-profit less-than-2-year, private for-profit 2-year, private for-profit 4-year, and other. The "other" category includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year institutions.

Control and level of first primary postsecondary institution **X5PFYSEC**

This variable applies to student record respondents and indicates the control and level of the primary institution in which students were enrolled during the first academic year in postsecondary education after high school completion or exit. Students' first primary postsecondary institutions were identified based on enrollment data in both transcripts and student records; thus, this variable may differ from transcript-based X5PS1SEC. The original 12 categories of this variable were recoded into the following seven categories in this report: public 2-year, public 4-year, private nonprofit 4-year, for-profit less-than-2-year, for-profit 2-year, for-profit 4-year, and other. The "other" category includes private nonprofit 2-year, private nonprofit less-than-2-year, and public less-than-2-year institutions.

Cumulative high school grade point average (GPA) **X3TGPAOT**

This variable indicates students' high school 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: lower than 2.50, 2.50–2.99, 3.00–3.49, and 3.50 or higher.

Degree program at first primary institution **X5PFYDEGREE**

This variable applies to student record respondents and indicates the type of degree program in which students were enrolled at their primary institution during the first academic year in postsecondary education after high school completion or exit. If a student was enrolled in more than one program at the primary institution simultaneously, the highest degree program was used. The variable has the following categories: no certificate or degree, undergraduate certificate, associate's degree, and bachelor's degree.

Federal Direct Loans at first primary institution **X5PFYSTAFFAMT**

This variable applies to student record respondents and indicates the total dollar amount of federal Direct Subsidized and Unsubsidized Loans (also known as subsidized and unsubsidized Stafford Loans) students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. Students may receive both subsidized and unsubsidized loans. Subsidized loans are awarded based on need, and students are not charged interest on such loans while they are enrolled. Percentage estimates indicate students who received more than \$0 in federal Direct Loans.

Federal Direct PLUS Loans to parents at first primary institution **X5PFYPLUSAMT**

This variable applies to student record respondents and indicates the total dollar amount in federal Direct PLUS Loans students' parents received through students' primary institution during the first academic year in postsecondary education after high school completion or exit. Federal Direct PLUS Loans to parents are available to the parents of dependent students and are not based on need. Percentage estimates indicate students whose parents received more than \$0 in Direct PLUS Loans.

Federal Pell Grants at first primary institution **X5PFYPELLAMT**

This variable applies to student record respondents and indicates the total dollar amount of federal Pell Grants students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. Pell Grants are need-based grants awarded to undergraduates who demonstrate exceptional financial need and have not yet received a bachelor's, graduate, or professional degree. They are intended to be a financial base to which other financial aid awards can be added. The maximum Pell Grant amount changes yearly (e.g., \$5,775 for the 2015–16 award year and \$6,095 for the 2018–19 award year). Each student's Pell Grant amount depends on his or her expected family contribution (EFC) and actual attendance pattern (full time or part time, full year or part year). Percentage estimates indicate students who received more than \$0 in Pell Grants.

Federal, state, and institutional loans at first primary institution **X5PFYTOTLOAN3**

This variable applies to student record respondents and indicates the total dollar amount of federal, state, and institutional loans students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. Private commercial or alternative loans and federal Direct PLUS Loans to parents are not included. Percentage estimates indicate students who received more than \$0 in federal, state, or institutional loans.

Federal Title IV aid at first primary institution **X5PFYTITIVAMT**

This variable applies to student record respondents and indicates the total dollar amount of federal Title IV financial aid students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of federal Title IV loans (including federal Direct PLUS Loans to parents), federal Title IV grants, and federal college work-study. This variable does not include non-Title IV aid from other federal sources such as Public Health Service Loans, Bureau of Indian Affairs Grants, District of Columbia Tuition Assistance Grants, and Iraq and Afghanistan Service Grants. This variable also does not include federal veterans' education benefits or education tax credit and tax deduction benefits. Percentage estimates indicate students who received more than \$0 in federal Title IV aid.

VARIABLE

Grade point average (GPA) earned through June 2016 **X5GPAALL**

This variable applies to postsecondary transcript respondents and indicates students' cumulative undergraduate GPA earned in all courses recorded on postsecondary transcripts received from all known institutions attended after high school completion or exit. GPA was normalized to a 4.0 scale. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation of the GPA.

Highest education attained by either parent **X2PAREDU**

This variable indicates the highest level of education achieved by either parent. It is based on data collected in the first follow-up parent questionnaire. If parent questionnaire data were missing, the variable was imputed from the base-year parent questionnaire and the first follow-up student questionnaire. For this report, categories for no high school credential and completion of a high school diploma or alternative credential were combined into the high school credential or lower category. The next two categories (certificate or diploma from a school providing occupational training and associate's degree) were combined into a certificate or associate's degree category. The three highest level categories (bachelor's degree, master's degree, and PhD/MD/law/other high-level professional degree) were combined into a bachelor's or higher degree category.

Highest postsecondary attainment and persistence status as of June 2016 **X5ENRATT**

This variable applies to postsecondary transcript respondents and indicates students' highest postsecondary attainment, enrollment status, and the level of the institution in which they were currently enrolled as of June 2016. The variable was recoded into the following categories in this report: no credential, not enrolled; no credential, enrolled at less-than-4-year institution; no credential, enrolled at 4-year institution; no credential, enrolled, level unknown; attained an undergraduate certificate; attained an associate's degree; and attained a bachelor's degree. Since "no credential, enrolled, level unknown" did not have any students in the sample selected for this report, this category was not presented in the tables.

Institutional aid at first primary institution **X5PFYINSTAMT**

This variable applies to student record respondents and indicates the total dollar amount of institutional aid students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of institutional grants and fellowships, institutional loans, and institution-sponsored work-study. Percentage estimates indicate students who received more than \$0 in institutional aid.

Institutional grants at first primary institution **X5PFYINGRTAMT**

This variable applies to student record respondents and indicates the total dollar amount of institutional grants students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of institutional need-based and non-need-based grants. Percentage estimates indicate students who received more than \$0 in institutional grants.

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

This variable indicates a student's major field of study for the degree or certificate that the student was working on in February 2016 or most recently before February 2016. In the case of a double major, the major field that the student reported first was used. Students' major fields were coded based on the U.S. Department of Education's 2010 Classification of Instructional Programs (CIP 2010). More information about CIP is available at <https://nces.ed.gov/ipeds/cipcode/>.

Mathematics achievement quintile in 11th grade**X2TXMQUINT**

This variable indicates students' achievement in algebra content and processes based on their performance during the first follow-up on the HSLS:09 mathematics assessment. The test framework covers a representative cross-section of the major domains and key processes of algebra. For more information on the design of the assessment, see chapter 2 of *High School Longitudinal Study of 2009 (HSLS:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

The variable is a norm-referenced measure of achievement. The quintile score divides the weighted achievement distribution into five equal-sized groups, based on 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 Item Response Theory, and the derivation of the mathematics quintile variable, see chapter 2 of *High School Longitudinal Study of 2009 (HSLS:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

Merit-based grants at first primary institution**X5PFYMERITAI**

This variable applies to student record respondents and indicates the total dollar amount of merit-only grants and scholarships students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of state merit-only grants and scholarships and institutional merit-only grants and scholarships, including athletic scholarships. Percentage estimates indicate students who received more than \$0 in merit-based grants.

Need-based grants at first primary institution**X5PFYNEEDAID**

This variable applies to student record respondents and indicates the total dollar amount of need-based grants students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of federal Pell Grants, federal Supplemental Educational Opportunity Grants, state need-based grants, and institutional need-based grants. The state and institutional need-based grants may include need-based grants that also have a merit consideration. Percentage estimates indicate students who received more than \$0 in need-based grants.

Number of credits attempted through June 2016**X5POSTATT**

This variable applies to postsecondary transcript respondents and indicates the total number of known undergraduate credits that students attempted as of June 2016. Credits were normalized (i.e., the hours or credit units earned were placed on a common scale) so that credit units can be compared across institutions. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation. Courses with a normalized grade of Advanced Placement (AP), transfer, audit, or drop were also excluded from the calculation.

Number of credits earned through June 2016**X5POSTERN**

This variable applies to postsecondary transcript respondents and indicates the total number of known undergraduate credits that students earned as of June 2016. Credits were normalized (i.e., the hours or credit units earned were placed on a common scale) so that credit units can be compared across institutions. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation. Courses with a normalized grade of incomplete, in-progress, audit, drop, withdrawal, or failing in a pass/fail course were also excluded from the calculation.

VARIABLE

Number of remedial courses passed through June 2016 **X5REMPASS**

This variable applies to postsecondary transcript respondents and indicates the total number of known remedial courses (in any field) that students passed during their postsecondary education as of June 2016. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation. The 2010 College Course Map (CCM) was used to code course data and identify courses as remedial. More information about the 2010 CCM is available at <https://nces.ed.gov/surveys/pets/ccm.asp>. The definition of remedial courses was revised from the definition used to identify remedial courses for the ELS: 2002 Postsecondary Education Transcripts Study. Specifically, based on the expert panel recommendations, CCM Codes 23.1397 (Business English) and 27.9990 (Business Math) were not counted as remedial courses.

Number of remedial courses taken through June 2016 **X5REMTOT**

This variable applies to postsecondary transcript respondents and indicates the total number of known remedial courses (in any field) that students took during their postsecondary education as of June 2016. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation. The 2010 College Course Map (CCM) was used to code course data and identify courses as remedial. More information about the 2010 CCM is available at <https://nces.ed.gov/surveys/pets/ccm.asp>. The definition of remedial courses was revised from the definition used to identify remedial courses for the ELS: 2002 Postsecondary Education Transcripts Study. Specifically, based on the expert panel recommendations, CCM Codes 23.1397 (Business English) and 27.9990 (Business Math) were not counted as remedial courses.

Number of STEM credits attempted through June 2016 **X5STEM1ATT**

This variable applies to postsecondary transcript respondents and indicates the total number of known undergraduate STEM credits that students attempted during their postsecondary education as of June 2016. Credits were normalized (i.e., the hours or credit units earned were placed on a common scale) so that credit units can be compared across institutions. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation. Courses with a normalized grade of Advanced Placement (AP), transfer, audit, or drop also were excluded from the calculation. The 2010 College Course Map (CCM) was used to code course data. More information about the 2010 CCM is available at <https://nces.ed.gov/surveys/pets/ccm.asp>. Courses identified as STEM in this variable were adapted from the National Science and Mathematics Access to Retain Talent (SMART) Grant Program, 34 C.F.R. 691.17(d). More information about SMART is available at https://smartscholarshipprod.service-now.com/smart?id=smart_index.

Number of STEM credits earned through June 2016 **X5STEM1ERN**

This variable applies to postsecondary transcript respondents and indicates the total number of known undergraduate STEM credits that students earned during their postsecondary education as of June 2016. Credits were normalized (i.e., the hours or credit units earned were placed on a common scale) so that credit units can be compared across institutions. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation. Courses with a normalized grade of incomplete, in-progress, audit, drop, withdrawal, or failing in a pass/fail course also were excluded from the calculation. The 2010 College Course Map (CCM) was used to code course data. More information about the 2010 CCM is available at <https://nces.ed.gov/surveys/pets/ccm.asp>. Courses identified as STEM in this variable were based on the National Science and Mathematics Access to Retain Talent (SMART) Grant Program, 34 C.F.R. 691.17(d). More information about SMART is available at https://smartscholarshipprod.service-now.com/smart?id=smart_index.

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 was based on information collected in the base-year student questionnaire; if this information was missing from that questionnaire, race/ethnicity was based on data from the school-provided sampling roster or from the base-year parent questionnaire. If race/ethnicity was missing from these base-year sources, it was taken from the first follow-up student questionnaire or, if missing in the first follow-up student questionnaire, was based on the race/ethnicity of 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.

Saw self as a math person (2016)**S4MPERSON1**

This variable is based on students’ responses to a second follow-up question “How much do you agree or disagree with this statement: You see yourself as a math person?” The variable was recoded into two categories in this report: “Agree or strongly agree” and “Disagree or strongly disagree.”

Saw self as a science person (2016)**S4SPERSON1**

This variable is based on students’ responses to a second follow-up question “How much do you agree or disagree with this statement: You see yourself as a science person?” The variable was recoded into two categories in this report: “Agree or strongly agree” and “Disagree or strongly disagree.”

Selectivity and level of first known postsecondary institution**X5PS1SLC**

This variable applies to postsecondary transcript respondents and indicates the selectivity and level of the first known postsecondary institution attended. Students’ first known postsecondary institutions were identified based on enrollment data in transcripts. Enrollment at an institution exclusively while in high school is not considered first enrollment. Selectivity was determined based on admissions for the postsecondary institutions reported in the Integrated Postsecondary Education Data System (IPEDS) from 2002 through 2012 and the 2010 Carnegie Classification. Four-year institutions coded as “highly selective” refer to those whose first-year students’ entrance exam test scores place them in roughly the top fifth of baccalaureate institutions. Four-year institutions coded as “moderately selective” refer to those whose first-year students’ entrance exam test scores place them in roughly the middle fifth of baccalaureate institutions. Four-year institutions coded as “inclusive” did not report test score data or their scores indicate that they extend educational opportunity to a wide range of students with respect to academic preparation and achievement. This variable has the following categories: highly selective, 4-year; moderately selective, 4-year; inclusive, 4-year; selectivity not classified, less-than-2-year; selectivity not classified, 2-year; and selectivity not classified, 4-year.

Selectivity and level of first primary postsecondary institution**X5PFYSLC**

This variable applies to student record respondents and indicates the selectivity and level of the primary institution in which students were enrolled during the first academic year in postsecondary education after high school completion or exit. Selectivity was determined based on admissions for the postsecondary institutions reported in the Integrated Postsecondary Education Data System (IPEDS) from 2002 through 2012 and the 2010 Carnegie Classification. Four-year institutions coded as “highly selective” refer to those whose first-year students’ entrance exam test scores place them in roughly the top fifth of baccalaureate institutions. Four-year institutions coded as “moderately selective” refer to those whose first-year students’ entrance exam test scores place them in roughly the middle fifth of baccalaureate institutions. Four-year institutions coded as “inclusive” did not report test score data or their scores indicate that they extend educational opportunity to a wide range of students with respect to academic preparation and achievement. Students’ first primary postsecondary institutions were identified based on enrollment data in both transcripts and student records; thus, this variable may differ from transcript-based X5PS1SLC. This variable has the following categories: highly selective, 4-year; moderately selective, 4-year; inclusive, 4-year; selectivity not classified, less-than-2-year; selectivity not classified, 2-year; and selectivity not classified, 4-year.

VARIABLE

Sex**X2SEX**

This variable updates the base-year variable, X1SEX. Sex was based on information collected in the base-year student questionnaire; if this information was missing in that questionnaire, sex was then based on data from the school-provided sampling roster or the base-year parent questionnaire. If sex was missing from these base-year sources, it was taken from the first follow-up student questionnaire.

State aid at first primary institution**X5PFYSTATEAMT**

This variable applies to student record respondents and indicates the total dollar amount of state aid students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of state grants; state loans; state-sponsored work-study; and vocational rehabilitation and job training grants, including federal Workforce Investment Act funds. Grants awarded by California public institutions but funded by the state (Community College Board of Governors Grants, California State University Grants, and Educational Opportunity Program grants) were included as state aid. Percentage estimates indicate students who received more than \$0 in state aid.

State grants at first primary institution**X5PFYSTGTAMT**

This variable applies to student record respondents and indicates the total dollar amount of state grants, scholarships, and fellowships students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. It is the sum of state need-based grants, state non-need-based grants, and the federal matching funds to states through the Leveraging Education Assistance Partnership program. Percentage estimates indicate students who received more than \$0 in state grants.

STEM grade point average (GPA) earned through June 2016**X5STEM1GPA**

This variable applies to postsecondary transcript respondents and indicates students' cumulative undergraduate GPA earned in all known STEM courses recorded on postsecondary transcripts received from all known institutions attended after high school completion or exit. GPA was normalized to a 4.0 scale. Duplicate course records, created by the transfer of course credits to one or more additional institutions, were counted only once. Courses that were a part of a graduate program, ended after June 2016, or were not provided by a transcript were excluded from the calculation in this GPA. The 2010 College Course Map (CCM) was used to code course data. More information about the 2010 CCM is available at <https://nces.ed.gov/surveys/pets/ccm.asp>. Courses identified as STEM in this variable were based on the National Science and Mathematics Access to Retain Talent (SMART) Grant Program, 34 C.F.R. 691.17(d). More information about the SMART Grant program is available at https://smartscholarshipprod.service-now.com/smart?id=smart_index.

Tuition and fees at first primary institution**X5PFYTUITION**

This variable applies to student record respondents and indicates the total tuition and fees charged at the primary institution during the first academic year in postsecondary education after high school completion or exit. The tuition as reported by institutions was the primary source, edited and adjusted for attendance status if needed. If tuition data were not available from institutions, tuition data were taken from the Integrated Postsecondary Education Data System (IPEDS) Institutional Characteristics data collection corresponding with the student's primary first-year institution and adjusted for attendance status. That is, if full-time full-year tuition was reported and the student was only enrolled for full-time half-year, the tuition amount was adjusted down to represent full-time half-year enrollment.

**Tuition and fees minus federal Title IV, state, and institutional aid
at first primary institution****X5PFYNETPRICEALL**

This variable applies to student record respondents and indicates students' total dollar amount in tuition and fees that remained after subtracting federal Title IV aid, state aid, and institutional aid students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. Other sources (e.g., private grants and loans, employer tuition reimbursements, and veterans' education benefits) are not included in the calculation. Aid helps cover the entire student budget, not just tuition and fees, so it may be greater than tuition and fees alone. The variable was set to zero if the sum of federal Title IV, state, and institutional aid was greater than tuition and fees.

**Tuition and fees minus federal Title IV, state, and institutional
grant aid at first primary institution****X5PFYNETPRICEGRT**

This variable applies to student record respondents and indicates students' total dollar amount in tuition and fees that remained after subtracting federal Title IV grants, state grants, and institutional grants students received at their primary institution during the first academic year in postsecondary education after high school completion or exit. Grant aid helps cover the entire student budget, not just tuition and fees, so it may be greater than tuition and fees alone. This variable was set to zero if the sum of federal Title IV, state, and institutional grant aid was greater than tuition and fees.

Appendix C—Technical Notes and Methodology

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

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 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 their base-year high school. Sample members were asked to complete both a questionnaire and a 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 sample consisted of study-eligible students selected for the base year in 2009–10 who were not deceased as of the 2013 Update. 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.

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 coded using 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. Course credits, course grades, and other measures derived from transcripts were standardized to ensure comparability across schools.⁵ In addition, student records were matched to external data sources to obtain SAT and ACT scores, Free Application for Federal Student Aid 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 included questions on a variety of 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.

⁵ 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.

Between spring 2017 and fall 2018, as part of the PETS-SR data collection, all known postsecondary institutions that sample members attended were asked to provide transcripts and complete the Student Records instrument. The postsecondary transcript data⁶ obtained provide detailed information about students' academic experiences, including academic performance, credit accumulation, enrollment periods, and degree completion. The student records data obtained provide detailed information about students' enrollment patterns, programs of study, tuition and fees, price of attendance, and various types of financial aid received from federal, state, institution, and other sources for each year starting from their first academic year in postsecondary education through 2016–17. The academic year in which sample members first enrolled in postsecondary education after high school varies, ranging from 2011–12 to 2016–17; most (80 percent) fall 2009 ninth-graders who enrolled in postsecondary education after high school began in the 2013–14 academic year (table C-1). In addition to data obtained from institutions, federal loan and grant data were collected from the U.S. Department of Education's National Student Loan Data System (NSLDS).

Table C-1. Among fall 2009 ninth-graders who enrolled in postsecondary education after high school, percentage distribution by first academic year enrolled

Academic year	Percent ¹
Total	100.0
2011–12	0.5
2012–13	2.7
2013–14	80.1
2014–15	8.6
2015–16	4.9
2016–17	3.2

¹ Percentages are weighted by the student record weight.

SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSL:09), Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

C.2. Instrumentation

The Postsecondary Data Portal (PDP) website, which NCES developed to facilitate the collection of information from postsecondary institutions, provided institutions with information about the study and a secure platform to upload requested data electronically, including transcripts and student records.

⁶ Coursetaking records from postsecondary transcripts were coded using the 2010 Classification of Instructional Programs (CIP) taxonomic scheme. More information about CIP is available at <https://nces.ed.gov/ipeds/cipcode/>.

C.2.1 Postsecondary Education Transcripts

Once received, transcripts were keyed⁷ and coded using the Keying and Coding System (KCS), a web-based platform for data entry that facilitates the efficient and secure collection of data from student transcripts. The application includes five main sections in which student-level data are stored: Case Information, Schools and Terms, Tests, Degrees, and Courses. For each section, project staff used the transcript and an institution-specific course catalog to code and enter relevant data.

1. *Case Information.* The Case Information section captures the student’s name, address, date of birth, Social Security number, and high school graduation date.
2. *Schools and Terms.* On the Schools and Terms section, HSLs:09 project staff confirmed that all schools appearing on a transcript were captured in the KCS, including the school that issued the transcript and any transfer schools. Schools known to have been attended were loaded into the KCS for each student based on previously collected data—the 2013 Update and second follow-up surveys as well as NSLDS data matching—and transcripts. Staff members entered all academic terms in which the student was enrolled in at least one course and also entered the student’s cumulative GPA in this section.
3. *Tests.* The Tests section stores the test name and student’s score for each test, such as the SAT, that appeared on a transcript.
4. *Degrees.* Project staff entered any degrees attempted or earned in the Degrees section. If a degree was awarded, they entered the date of receipt and any graduation honors. For each degree program, they entered the field of study, including majors, minors, and concentrations.
5. *Courses.* HSLs:09 project staff entered course-specific information and coded course content in the Courses section. Elements recorded included the term in which each course was taken, course number, course name, grade earned, credit or clock hours earned or attempted, and such course attributes as whether the course was a lab. Noncourse credit, such as credit for an AP exam, was also entered in this section.

To enhance the utility of the KCS and aid in validating the accuracy of captured data, the KCS includes such specific features as direct links to the transcript PDF and course catalog files, validated fields for value range and value types (i.e., numeric versus numeric string), and requirements that all fields of study and courses receive a code.

⁷ “Keying” refers to data entry. For transcripts, the keying task is the act of entering all data from the transcript into a web-based system.

C.2.2 Student Financial Aid Records

Institutions provided student financial aid records in any of three modes. Institution coordinators selected the mode or modes that were most convenient for them from the following choices:

1. Web mode, in which institution staff used drop-down boxes and text-entry fields to enter data directly on the PDP website, one student at a time;
2. Excel mode, in which institutions downloaded a preformatted Excel spreadsheet template from the PDP, entered or copied student data into the spreadsheet offline, and then uploaded the completed spreadsheet to the PDP website; and
3. Comma-separated values mode, in which institutions downloaded file specifications from the PDP website, prepared data files offline according to the file specifications, and then uploaded completed files to the PDP website.

The HSLS:09 student financial aid records data included the following five categories of data:

1. *Institution Information*—terms during which students were enrolled at the postsecondary institution in each academic year.
2. *General Student Information*—student characteristics and contact information.
3. *Enrollment*—degree program, major(s), class level, and enrollment intensity at the postsecondary institution from July 1, 2011 through June 30, 2017.
4. *Budget*—budgeted costs of attendance at the institution for each year from July 1, 2011 through June 30, 2017.
5. *Financial Aid*—federal, state, institution, graduate, and any private or other financial aid awards the student received at the institution from July 1, 2011 through June 30, 2017.

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 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 school response rate. This weighted response rate was calculated with the school-level base weight as the sum of the weights for the eligible, responding schools divided by the sum of the weights for all

eligible schools. The target population at the school level was defined as regular public schools, including public charter schools, and private schools⁸ in the 50 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 each of 10 states (California, Florida, Georgia, Michigan, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, and Washington).

The target population of students included all ninth-grade students who attended study-eligible schools in the fall 2009 term. In the second stage of sampling, about 27 students per school were randomly selected from school enrollment rosters, and 25,206 of the selected students were determined to be eligible.⁹ Of the 25,206 base-year sample members, 25,184 were eligible for the first follow-up (22 were deceased or ineligible), 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; a cumulative total of 83 were found to be deceased or ineligible. Sample members eligible for PETS-SR consisted of those eligible as of the second follow-up who had ever enrolled at a postsecondary institution. Sample members eligible for the student records collection were a subset of those eligible for PETS, especially those who were enrolled in a postsecondary institution after the completion of high school or high school equivalency. For this round of data collection, 17,338 sample members were eligible for the PETS component and 17,230 were eligible for the SR component.

C.4. Response Rates

Table C-2 provides a summary of the weighted student response rates for each round of data collection. The PETS-SR data collection ended with a 71 percent weighted response rate for the PETS component and a 49 percent response rate for the SR component. Further details may be found in *High School Longitudinal Study of 2009 (HSLs:09) Postsecondary Education Transcript Study and Student Financial Aid Records Collection Data File Documentation* (Duprey et al. forthcoming).

⁸ 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).

⁹ 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 they were foreign exchange students. Study eligibility was confirmed during each round for sample members who had not yet been interviewed.

Table C-2. Summary of HSLs:09 response rates by data collection round and instrument

Data collection round	Instrument	Eligible students	Respondents	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
	Math teacher questionnaire ²	23,621	17,882	71.9
	Science teacher questionnaire 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 transcripts	25,167	21,928	87.7
Second follow-up	Questionnaire	25,123	17,335	67.9
Postsecondary education transcript study and student financial aid records	Postsecondary transcripts ⁴	17,338	13,160	71.2
	Student aid records ⁵	17,230	8,688	48.7

¹ All weighted response rates 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* (Dalton, Ingels, and Fritch 2015), 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 *High School Longitudinal Study of 2009 (HSLs:09) Base-Year to First Follow-Up Data File Documentation* (Ingels et al. 2014).

⁴ Weighted response rates calculated using the student base weight adjusted for unknown eligibility with respect to PETS.

⁵ Weighted response rates calculated using the student base weight adjusted for unknown eligibility with respect to SR. SOURCE: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLs:09), Base Year, First Follow-Up, 2013 Update, High School Transcript Study, Second Follow-Up, and Postsecondary Education Transcript Study and Student Financial Aid Records Data Collection.

C.5 Weighting

Analysis 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.

Estimates related to postsecondary transcripts in this report were produced using the postsecondary transcripts weight (W5PSTRANS), which permits estimates generalizable to the U.S. population of ninth-graders in fall 2009 who were attending schools with both a ninth and eleventh grade and who were ever enrolled in an IPEDS-participating postsecondary institution as of June 30, 2017. This weight is appropriate for analyses involving only postsecondary transcripts data. Estimates related to postsecondary student records in this report were produced using the

postsecondary student records weight (W5PSRECORDS), which permits estimates generalizable to the U.S. population of ninth-graders in fall 2009 who were attending schools with both a ninth and eleventh grade and who were ever enrolled in an IPEDS-participating postsecondary institution as of June 30, 2017, after completion of high school or its equivalent. This weight is appropriate for analyses involving only postsecondary student records data. Both of these weights' 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 rates for PETS-SR fell below 85 percent (table C-2). Therefore, in accordance with NCES statistical standards, the data were subjected to a nonresponse bias analysis. Unit nonresponse bias analyses were conducted for the sets of respondents corresponding to the analysis weights constructed for PETS-SR.

Fifteen categorical variables were used to assess unit nonresponse bias. (Note that several of the 15 variables are derived from sampling frame data and are therefore not available in either the 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 were conducted. Bias estimates were computed for each set of respondents associated with each of the analysis weights. For each set of respondents, biases were estimated before nonresponse weight adjustments were applied to the sampling base weight adjusted for unknown eligibility and then estimated after nonresponse weight adjustments were applied to the sampling base weight adjusted for unknown eligibility. Appendix D of *HSL:09 Postsecondary Education Transcript Study and Student Financial Aid Records Collection Data File Documentation* (Duprey et al. forthcoming) provides bias estimates for each of the 15 variables (with their corresponding categorizations) before and after weight adjustments. Further information on the procedures for evaluating nonresponse bias and for their results can be found in chapter 5 of the same report. Overall, none of the variable categories exhibited significant estimated bias after all weighting adjustments. The results of these nonresponse bias analyses suggest that there is not substantial bias on the variables examined due to nonresponse after adjusting for that nonresponse. However, it is not possible to directly assess bias on the transcript and SR data because these data are not available for nonrespondents.

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.

Twenty-one key analysis variables were identified for single-value imputation from the PETS-SR data. Additional variables were considered for this list but were excluded because of either high item-level response rates or they were deemed to be of lesser analytic importance. Stochastic methods were used to impute the missing values. Indicator variables (flags) were created to allow users to easily identify the imputed cases. A listing of the imputed variables and further information on imputation procedures and quality checks can be found in chapter 5 of *HSLs:09 Postsecondary Education Transcript Study and Student Financial Aid Records Collection Data File Documentation* (Duprey et al. forthcoming).

C.8 Disclosure Risk Analysis and Protections

The disclosure treatment methods used to produce the HSLs:09 PETS-SR 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, meaning they could be disclosive, and their values were not provided in the public-use data files; rather, versions of these variables were provided in the public-use data files in which all values of these variables were suppressed. (i.e., all values of these variables were set to a “data suppressed” reserve code¹⁰). Other restricted-use variables were included in the public-use data 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 strictly continuous variables are included in the public-use data files.

¹⁰ See section 6.4 of *High School Longitudinal Study of 2009 (HSLs:09) Postsecondary Education Transcript Study and Student Financial Aid Records Collection Data File Documentation* (Duprey et al. forthcoming) for details on reserve code values used in the PETS-SR data files.

C.9 Variance Estimation

The HSLs:09 sample design included stratification, disproportionate sampling of cases within certain strata, and clustered (i.e., multistage) probability sampling. As a result of the complex sample design, statistics generated from HSLs:09 data may vary from those that would be expected 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 (e.g., BRR), which can be found in such statistical programs as Stata, SAS, SUDAAN[®], AM, or WesVar. The standard errors for estimates in this report were calculated using replicate weights generated with a BRR technique.

C.10 PowerStats

The estimates in this report were produced using PowerStats, a web-based software application that enables users to generate estimates with 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 a 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.