



2019 Doctorate Recipients from U.S. Universities

National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
National Science Foundation



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ABOUT THIS REPORT

The Survey of Earned Doctorates (SED), the data source for this report, is an annual census of individuals who receive research doctoral degrees from accredited U.S. academic institutions. The survey is sponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF) and by three other federal agencies: the National Institutes of Health, the Department of Education, and the National Endowment for the Humanities.

Monitoring the number of degrees awarded in science and engineering fields is an important part of the mission of NCSES, and the data from the SED are reported in several publications. The most comprehensive and widely cited

publication is this report, *Doctorate Recipients from U.S. Universities*. This annual report calls attention to major trends in doctoral education and is organized into four recurring themes and a special focus area that highlight important questions about doctorate recipients. Online, the reader is invited to explore trends in greater depth through detailed data tables and interactive graphics (<https://nces.nsf.gov/sed/>). Technical notes and related resources are provided to aid in interpreting the data, and report content is available for downloading. An interactive data tool with data from the SED and other NCSES surveys is also available at <https://ncesdata.nsf.gov/ids/sed>.

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EXECUTIVE SUMMARY

Doctoral education develops human resources that are critical to a nation's progress—scientists, engineers, researchers, and scholars who create and share new knowledge and new ways of thinking that lead, directly and indirectly, to new products, services, and works of art. Annual counts of doctorate recipients from U.S. universities are measures of the incremental investment in human resources devoted to science, engineering, research, and scholarship, and they can serve as leading indicators of the capacity for knowledge creation and innovation in various domains. Changes in this population over time—including increased representation of women, minorities, and foreign nationals; emergence of new fields of study; time it takes to complete doctoral study; expansion of the postdoctoral pool; academic employment opportunities after graduation; and pathways to the doctoral degree—reflect political, economic, social, technological, and demographic trends. Understanding these connections is necessary to make informed improvements in the country's doctoral education system.

Key takeaways from the 2019 data:

- In 2019, the number of doctorate recipients increased to 55,703. This represents a 1% increase from 2018, below the 3.2% average annual growth since the survey's inception.
- The proportion of doctorates earned by temporary visa holders remained steady at 36% between 2010 and 2017, then increased to 37% in 2018 and to 38% in 2019.
- The number of underrepresented minority doctorate recipients (Black or African American, Hispanic or Latino, and American Indian or Alaska Native) grew to 5,480 in 2019. This represents a 6.7% increase from 2018.
- Women continue to be more than half of doctorate recipients in life sciences, psychology and social sciences, education, humanities and arts, and other non-science and engineering (non-S&E) fields. However, they constitute about a third of those in physical sciences and earth sciences and a quarter of those in engineering and in mathematics and computer sciences.
- Although the pattern of rising parental educational attainment is visible among all races and ethnicities, doctorate recipients who are underrepresented minorities are less likely to have at least one parent with a bachelor's degree than their Asian or White counterparts.
- Definite commitments for employment across all broad fields have continued to increase since 2017, following low points in 2014–16.
- In 2019, in every broad field of study except for humanities and arts, median expected salaries for doctorate recipients committing to jobs in industry were higher than for those committing to postdoctoral positions or jobs in academe.
- In 2019, large majorities (71% and above) of doctorate recipients in science and engineering (S&E) fields excluding psychology and social sciences reported holding no debt related to their graduate education. In psychology and social sciences, humanities and arts, and in other non-S&E fields, the share of doctorate recipients with no debt was about half; in education, it was less than half.
- In the past 10 years, the share of Black or African American doctorate recipients with bachelor's degrees from historically Black colleges and universities (HBCUs) declined in both S&E and non-S&E fields, as the number of Black or African American undergraduate students increased but the number of HBCUs remained nearly constant.
- In the past 10 years, the proportion of Hispanic or Latino doctorate recipients with bachelor's degrees from high-Hispanic-enrollment institutions (HHEs) increased in both S&E and non-S&E fields, as the number of HHEs rose with Hispanic undergraduate enrollment.
- The majority of doctorate recipients earn a master's degree before their doctorate with the exception of those in the biological and biomedical sciences field, where only 41% of 2017–19 graduates earned a master's degree.

U.S. DOCTORATE AWARDS

Each new cohort of doctorate recipients increases the supply of prospective scientists, engineers, researchers, and scholars. Data on the composition of these cohorts reveal changes in the presence of different demographic groups.

Overall trends

The number of research doctorate degrees awarded by U.S. institutions in 2019 increased to 55,703, according to the Survey of Earned Doctorates (SED) (figure 1). Since the survey's inception, the number of doctorates awarded shows a strong upward trend—average annual growth of 3.2%—punctuated by periods of slow growth and even decline.

Since the SED began collecting data in 1957, the number of research doctorates awarded in science and engineering (S&E) fields has exceeded the number of non-S&E doctorates, and the gap has widened. From 1979 to 2019, the number of S&E doctorate recipients has more than doubled, while the number of non-S&E doctorates awarded in 2019 declined to just below the 1979 count. As a result, the proportion of S&E doctorates climbed from 58% in 1979 to 77% in 2019.

Citizenship

Overview

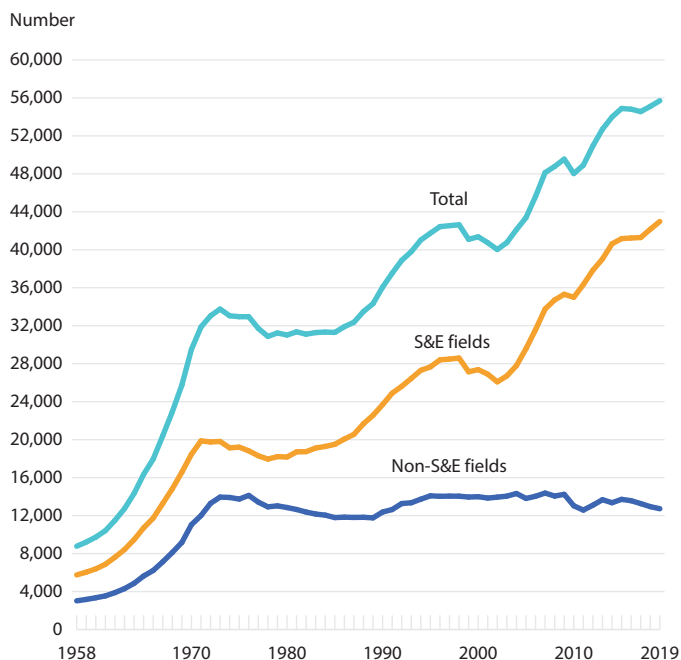
In 2019, the number of doctorates in S&E fields awarded to temporary visa holders was 15,801, an increase of 595 from 2018 (figure 2). Overall growth of doctorates awarded to temporary visa holders was up 99% since 2000 and 35% since 2010. Over the same period, the proportion of S&E doctorates awarded to temporary visa holders peaked at 41% in 2007, held steady at about 36% between 2010 and 2017, but increased to 38% in 2019.

In comparison, although starting from a larger base, the number of S&E doctorates awarded to U.S. citizens and permanent residents increased by 290 doctorates from 2018 to 2019 and experienced a slower relative growth overall (42% since 2000 and 20% since 2010).

Countries or economies of foreign citizenship

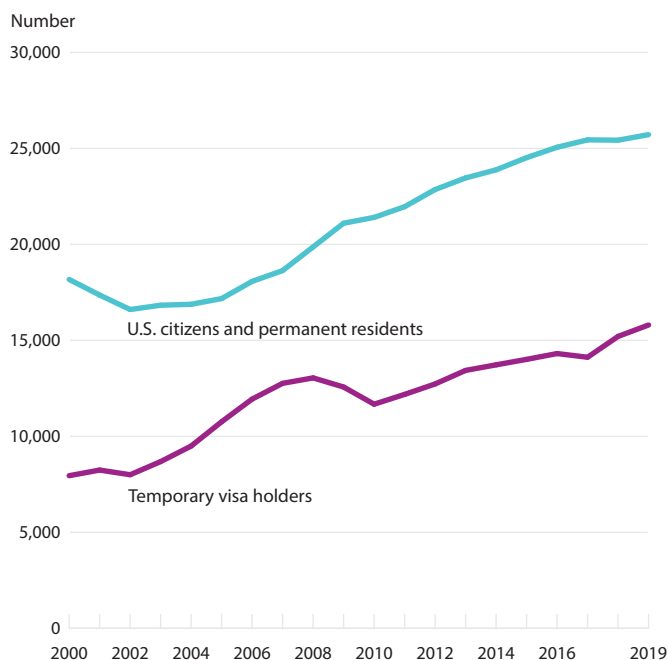
The number of doctorate recipients on temporary visas is highly concentrated in a few places of origin. In the past decade, 10 countries accounted for 70% of the 158,996 doctorates awarded to temporary visa holders, and the top three countries—China, India, and South Korea—accounted for over half (53%) (figure 3). Between 70% and 95% of doctorate recipients from these countries earned a doctorate in an S&E field.

Figure 1. Doctorates awarded by U.S. colleges and universities: 1958–2019



SOURCE: NCSES, Survey of Earned Doctorates, 2019.

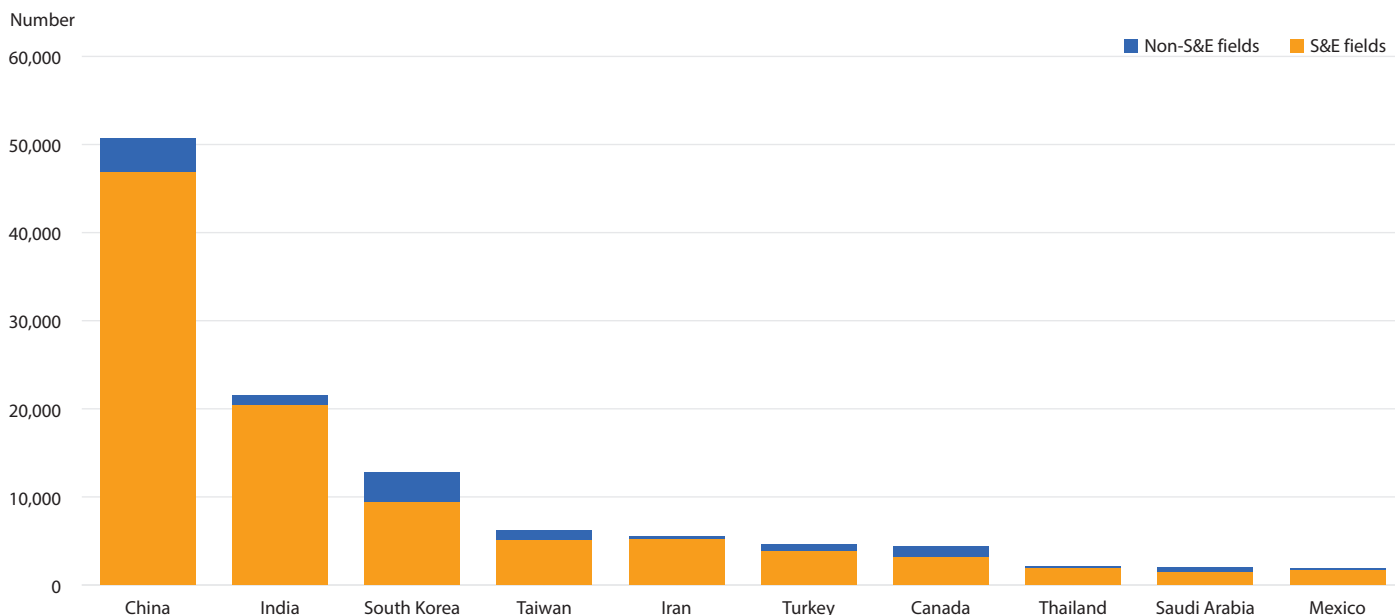
Figure 2. Doctorates awarded in S&E fields, by citizenship: 2000–19



NOTE: Excludes respondents who did not report citizenship.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 3. Top 10 countries of foreign citizenship for doctorate recipients with temporary visas: 2010–19



NOTES: China includes Hong Kong. Ranking based on total number of doctorate recipients.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Sex

Citizenship

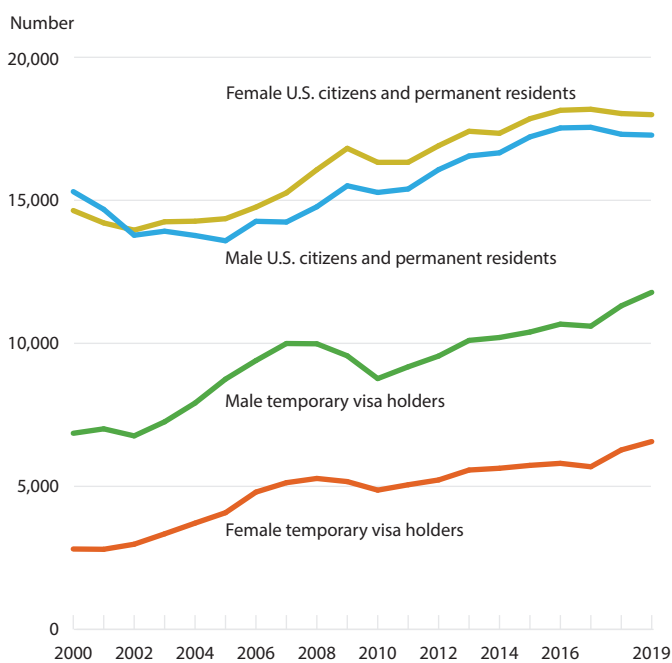
Overall, 46% of all doctorates in 2019 were awarded to women. Since 2002, women have earned just over half of all doctorates awarded to U.S. citizens and permanent residents and more than 31% of doctorates awarded to temporary visa holders (figure 4). From 2000 to 2008, the share of female doctorate recipients grew from 49% to 52% among U.S. citizens and permanent residents and from 29% to 35% among temporary visa holders. Since 2008, the shares of female doctorates in both citizenship categories have changed little.

Field of study

Most of the growth in the number of doctorates earned by both men and women has been in S&E fields (figure 5). From 2000 to 2019, the number of female doctorate recipients in S&E fields increased by 75%, though starting from a small base, compared with 47% growth in the number of male S&E doctorates. Women's share of S&E doctorates awarded increased from 38% in 2000 to 42% in 2009, and it has remained stable since then.

In non-S&E fields, 58% of doctorates were awarded to women in 2019, a share that has changed little since the late 2000s. The number of female non-S&E doctorate recipients declined by 5% between 2000 and 2019, while the number of male doctorate recipients in those fields declined by 15%.

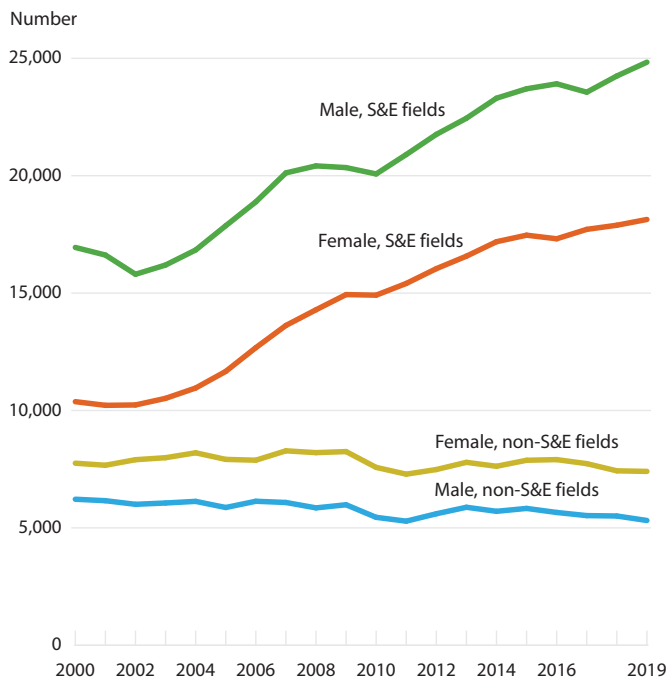
Figure 4. Sex and citizenship of doctorate recipients: 2000–19



NOTE: Excludes respondents who did not report sex or citizenship.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

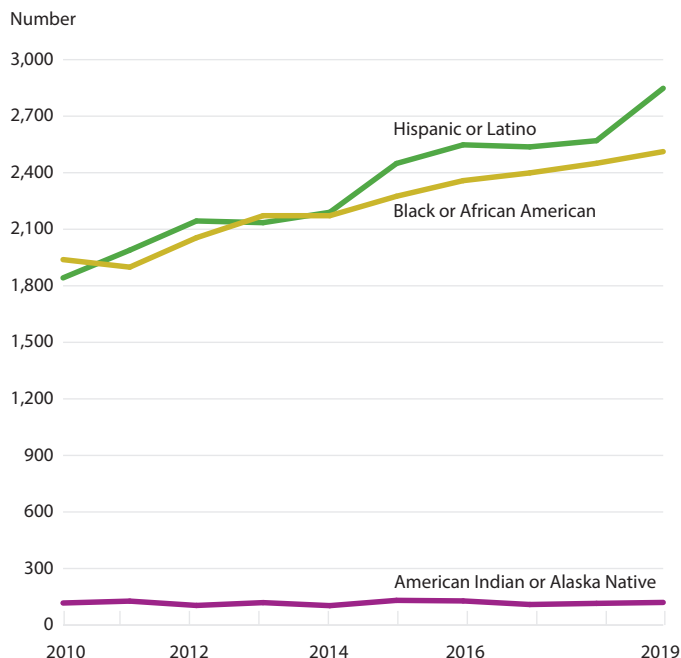
Figure 5. Sex and field of study of doctorate recipients: 2000–19



NOTE: Excludes respondents who did not report sex.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 6. Doctorates earned by underrepresented minority U.S. citizens and permanent residents: 2010–19



NOTE: Excludes U.S. citizen and permanent resident respondents who did not report race or ethnicity.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Race and ethnicity

Participation in doctoral education by underrepresented minorities who are U.S. citizens or permanent residents has been increasing, though starting from a small number. From 2010 to 2019, the number of Hispanic or Latino doctorate recipients increased from 1,842 to 2,848. As a result, the proportion of doctorates earned by this group

grew from 6% to 8% during this period. Also during this period, the number of Black or African American doctorate recipients increased from 1,939 to 2,512, and the proportion of doctorates they earned increased from 6% to 7%. The number of American Indian or Alaska Native doctorate recipients changed little, from 117 in 2010 to 120 in 2019, remaining under 1% (figure 6).

FIELDS OF STUDY

As researchers expand their understanding of the world, new fields of study emerge and existing fields change. Observing which fields of study are attracting growing proportions of students can provide early insight into where future research breakthroughs may occur.

Field of study trends

S&E

Doctorates in S&E fields are a growing share of all doctorates awarded. Every broad S&E field except for psychology and social sciences increased both its number and share of all doctorates over the past 2 decades. Psychology and social sciences increased in the number of doctorate recipients, but its share of all doctorates declined. Engineering had the largest growth among S&E fields, from 13% of all doctorates in 1999 to 19% in 2019 (figure 7).

Non-S&E

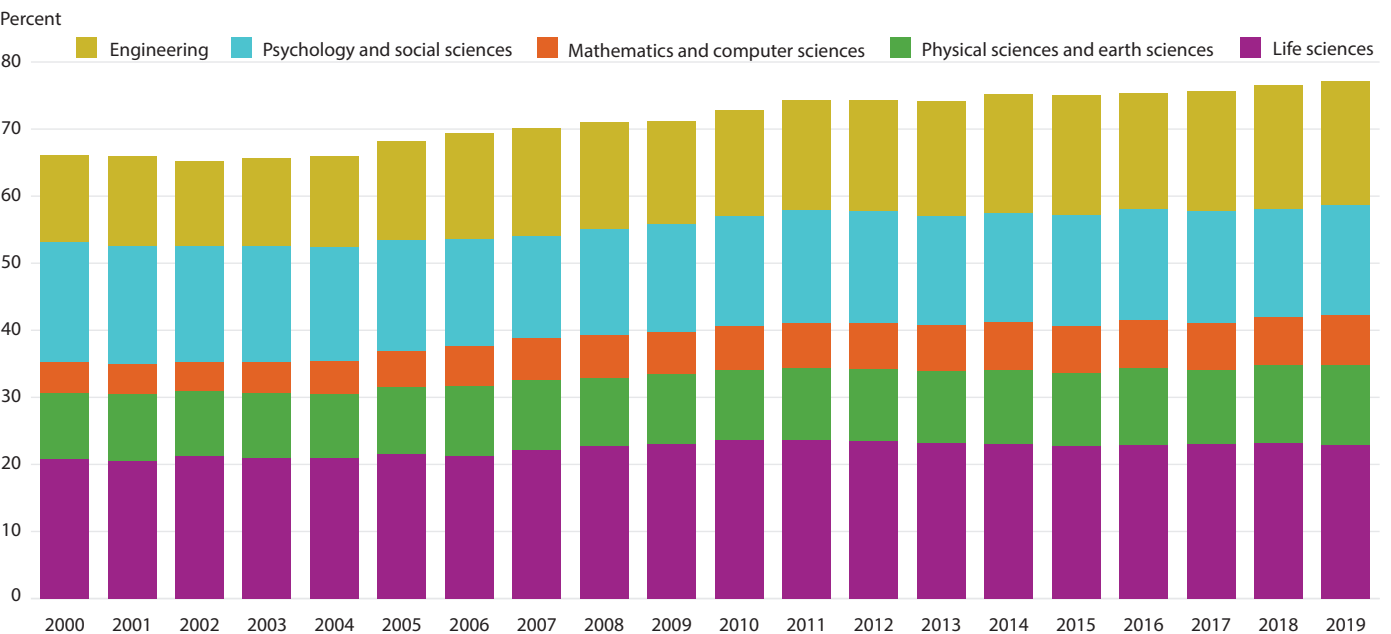
Within non-S&E fields, the number of doctorates awarded in education has declined over the past 2 decades, leading to a large, steady drop in the relative share of doctorates in that field. The number of humanities and arts doctorates increased during this period, but the field’s relative share fell 4 percentage points to 9% of all doctorates awarded in 2019. The number of doctorates in other non-S&E fields—such as business management and communication—increased, but their share remained fairly level (figure 8).

Temporary visa holders

In the past 2 decades, the number of doctorate recipients who are U.S. citizens or permanent residents increased in every broad field of study except education, where it declined. During this period, the number of doctorates awarded to temporary visa holders increased in every broad field and at a faster rate than that of U.S. citizens and permanent residents.

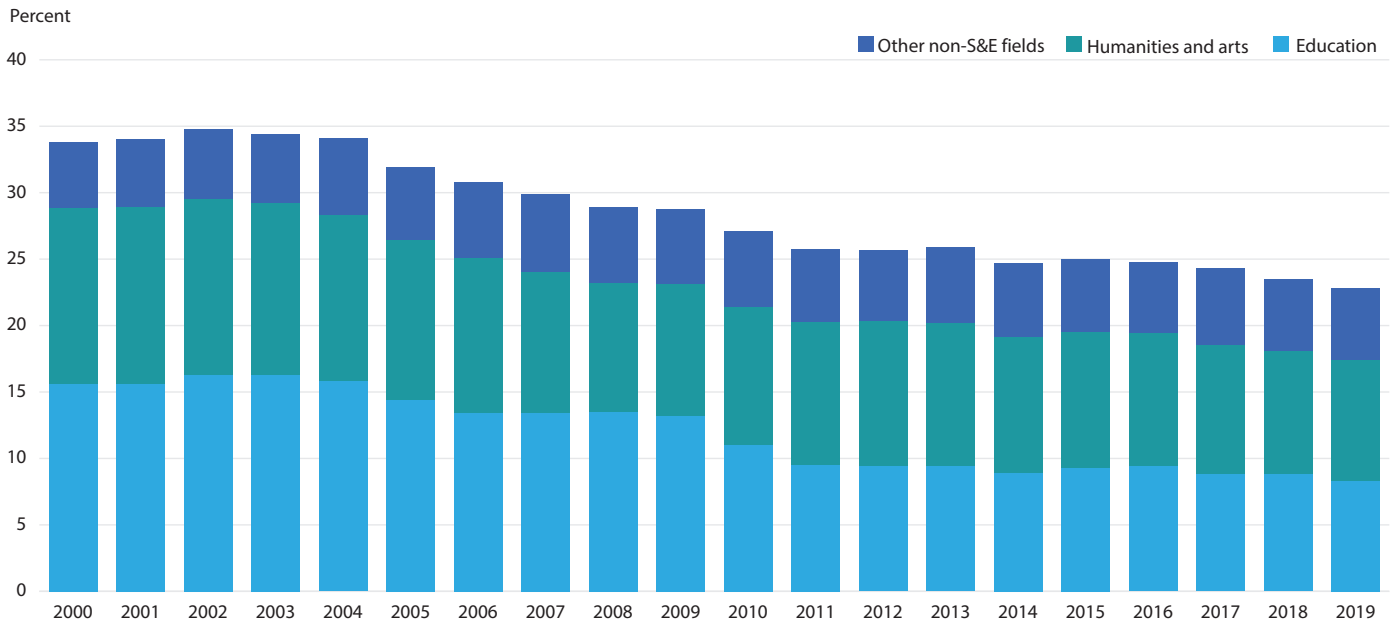
In 2019, temporary visa holders earned the majority of doctorates awarded in engineering (57%) and in mathematics and computer sciences (56%). Since 2000, the proportion of temporary visa holders increased the most in those two broad fields and in the category of other non-S&E fields, which includes business management and administration, communication, and other non-S&E fields not elsewhere classified (figure 9).

Figure 7. Doctorates awarded in S&E broad fields of study: 2000–19



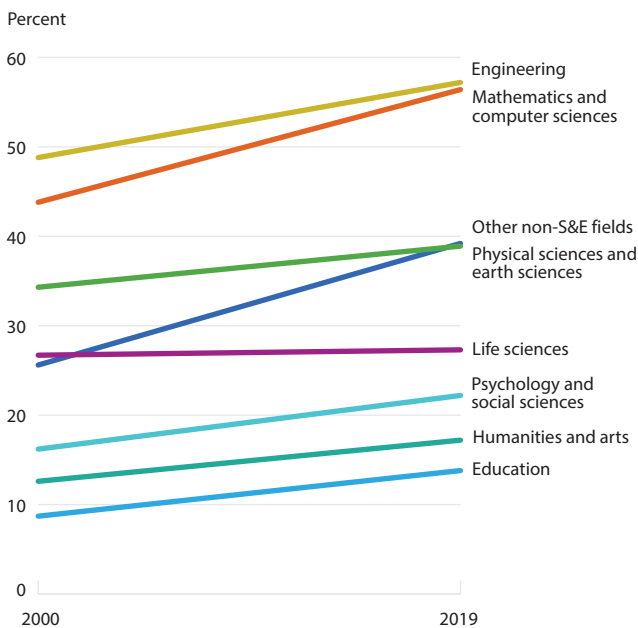
SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 8. Doctorates awarded in non-S&E broad fields of study: 2000–19



SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 9. Doctorate recipients on temporary visas: 2000 and 2019



NOTE: Percentages are based on the number of doctorate recipients who reported citizenship.

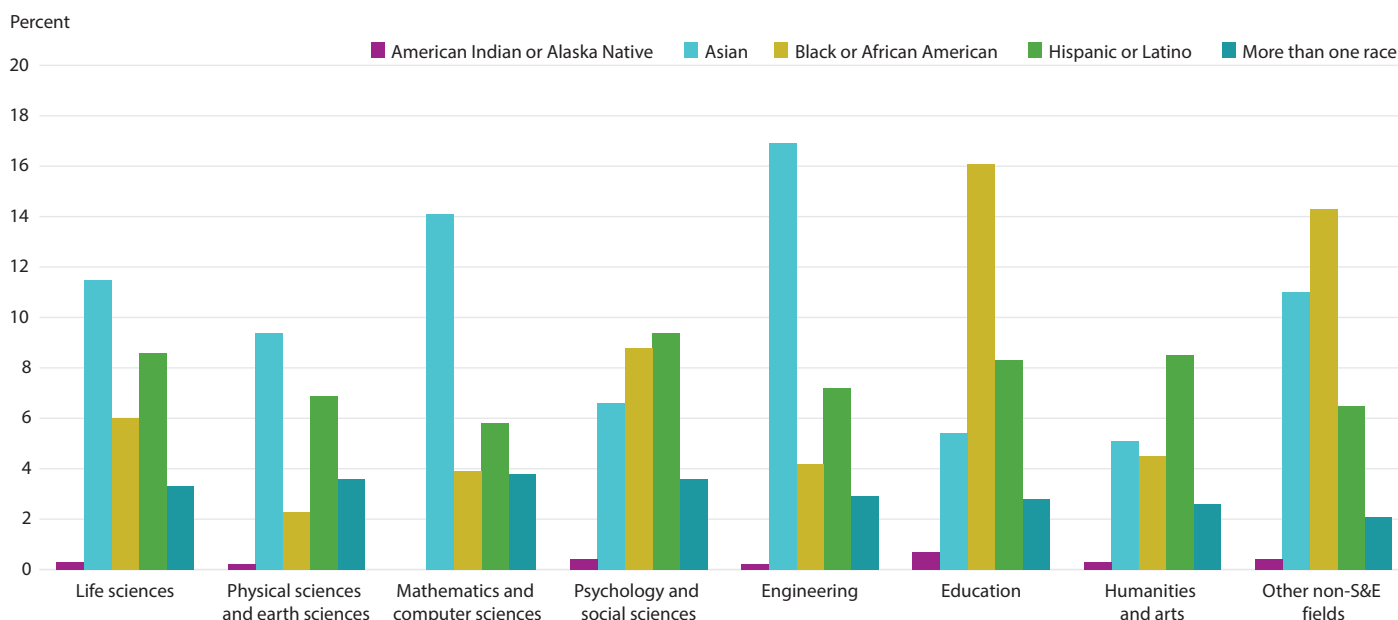
SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Minority U.S. citizens and permanent residents

In 2019, 69% of the 35,274 doctorate recipients who were U.S. citizens or permanent residents were White; 10% were Asian, 8% were Hispanic or Latino, 7% were Black or African American, and 3% identified as more than one race. The remaining doctorate recipients were either American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or did not report their race or ethnicity.

Among minority U.S. citizens and permanent residents, doctorate recipients of different racial or ethnic backgrounds are more heavily represented in some fields of study than in others. In 2019, Asians earned a larger share of doctorates than other racial and ethnic minority groups in life sciences, physical sciences and earth sciences, mathematics and computer sciences, and engineering. Black or African American doctorate recipients were the largest minority population in education and in other non-S&E fields. Hispanics or Latinos and Blacks or African Americans earned a larger proportion of doctorates in psychology and social sciences and in humanities and arts than did other minority groups (figure 10).

Figure 10. Doctorates awarded to minority U.S. citizens or permanent residents, by race, ethnicity, and broad field of study: 2019



NOTE: Excludes U.S. citizen and permanent resident respondents who did not report race or ethnicity or were Native Hawaiian or Other Pacific Islander.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Women

Overview

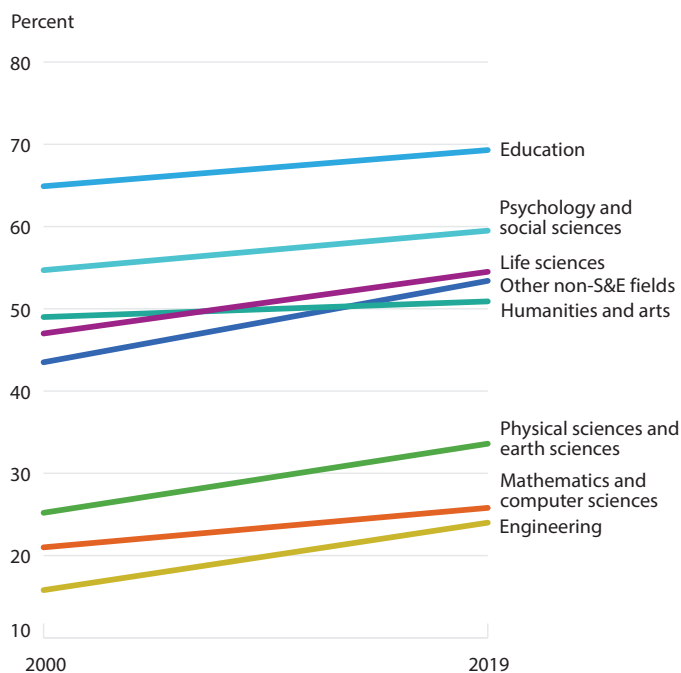
Women's share of doctorates awarded has grown over the past 2 decades in all broad fields of study. In 2019, women earned half or more of the doctorates awarded in life sciences, psychology and social sciences, education, humanities and arts, and other non-S&E fields.

Women earned only between about a quarter and a third of the doctorates awarded in engineering, in mathematics and computer sciences, and in physical sciences and earth sciences in 2019. However, women's shares of doctorates in these fields have grown over the past 20 years. From 2000 to 2019, the proportion of female doctorates grew considerably in life sciences (from 47% to 55%), in engineering (from 16% to 24%), and in physical sciences and earth sciences (from 25% to 34%). In psychology and social sciences and in mathematics and computer sciences women's share grew by 5 percentage points during this period (figure 11).

Growing and declining fields

The growth or decline in the share of women doctorate recipients in different fields does not always track with the overall growth of those fields.

Figure 11. Doctorates awarded to women, by broad field of study: 2000 and 2019



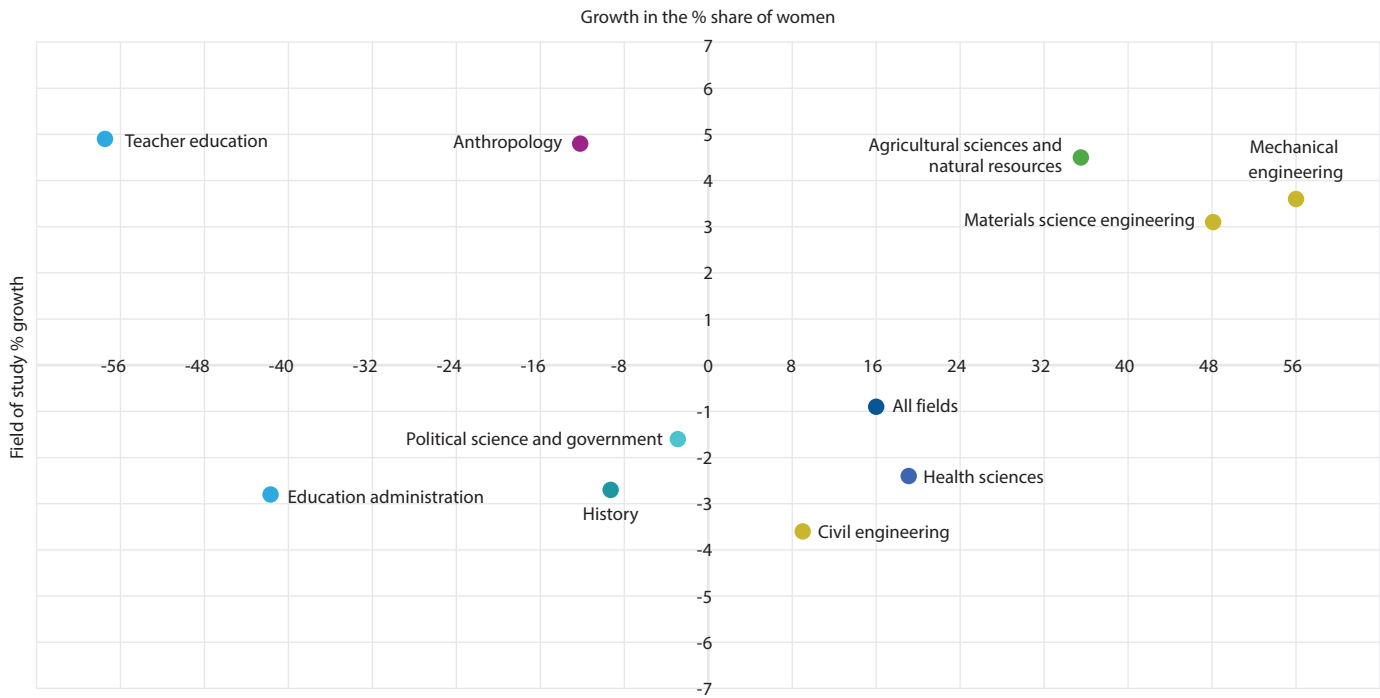
NOTE: Percentages are based on the number of doctorate recipients who reported sex.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

From 2010 to 2019, the proportion of female doctorate recipients increased between 3 and 4 percentage points in three fields where the overall numbers of doctorates increased: mechanical engineering, materials science engineering, and agricultural sciences and natural resources (figure 12). Women’s share of doctorates also increased about 5 percentage points in teacher education and anthropology, fields that declined in the overall number of doctorates awarded.

Despite the growth in the number of doctorate recipients in civil engineering and in the health sciences in the past 10 years, women’s shares of doctorates in these fields declined. The proportion of female doctorate recipients also declined in education administration, history, and political science and government—three fields in which the numbers of doctorates have declined as well.

Figure 12. Fastest changing fields of study for female doctorate recipients and rates of change: 2010–19



SOURCE: NCSES, Survey of Earned Doctorates, 2019.

PATH TO THE DOCTORATE

Some paths to the doctoral degree are less traveled and some are more difficult to navigate, owing to a variety of influences that shape doctoral study. These paths may lead to different postgraduate destinations.

Parental education

Overview

The parents of recent doctorate recipients are better educated than the parents of earlier cohorts of doctorate recipients.¹ The share of doctorate recipients from families in which neither parent has earned more than a high school diploma declined in the past 20 years. Meanwhile, the shares from families in which at least one parent has earned a bachelor's degree or at least one parent has an advanced degree increased (figure 13).

Race and ethnicity

The pattern of rising parental educational attainment is visible among all races and ethnicities for doctorate recipients who are U.S. citizens or permanent residents. Nonetheless, doctorate recipients who are underrepresented minorities—American Indian or Alaska Native, Black or African American, or Hispanic or Latino—are less likely to have at least one parent with a bachelor's degree than are Asian or White doctorate recipients.

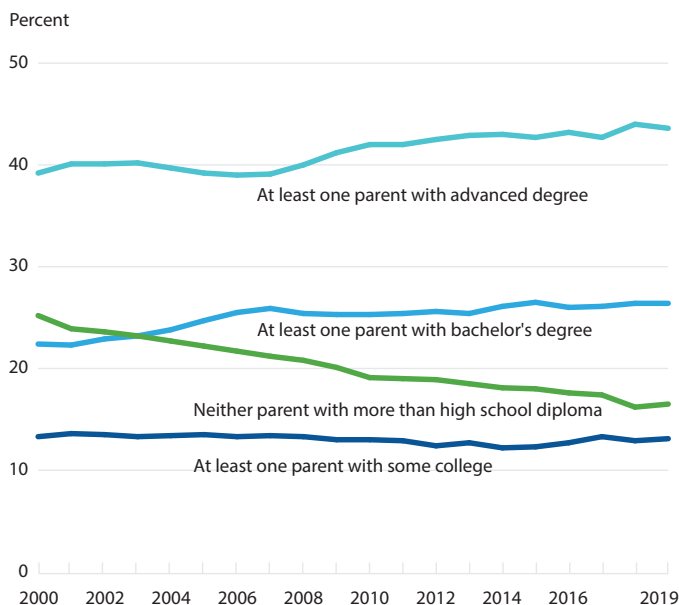
In 2019, about 75% of doctorate recipients who were Asian or White came from families having at least one parent who had a bachelor's degree or higher, compared with between 49% and 59% of doctorate recipients who were American Indian or Alaska Native, Black or African American, or Hispanic or Latino (figure 14).

Sources of financial support

Overview

In 2019, doctorate recipients reported research assistantships or traineeships as the most frequent primary source of financial support, followed by fellowships, scholarships, or dissertation grants and teaching assistantships. A third of doctorate recipients were primarily supported by research assistantships or traineeships; 25% by fellowships, scholarships, or dissertation grants; and 21% by teaching assistantships. About 15% of doctorate recipients relied primarily on their own resources—loans, personal savings, personal earnings, and the earnings or savings of

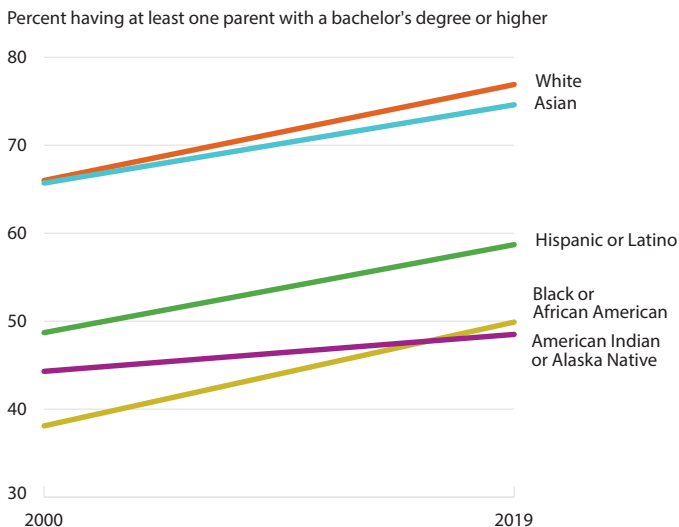
Figure 13. Doctorates awarded, by highest parental educational attainment: 2000–19



NOTES: Percentages are based on the number of doctorate recipients who responded to the item on the highest educational attainment for either parent. Percentages may not sum to 100% because of rounding and because of doctorate recipients who reported “not applicable” for both father’s and mother’s education beginning in 2004. Advanced degree includes master’s degree, professional degree, and research doctorate.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 14. Parental educational attainment of U.S. citizen or permanent resident doctorate recipients, by race and ethnicity: 2000 and 2019



NOTE: Percentages are based on the number of doctorate recipients who are U.S. citizens or permanent residents.

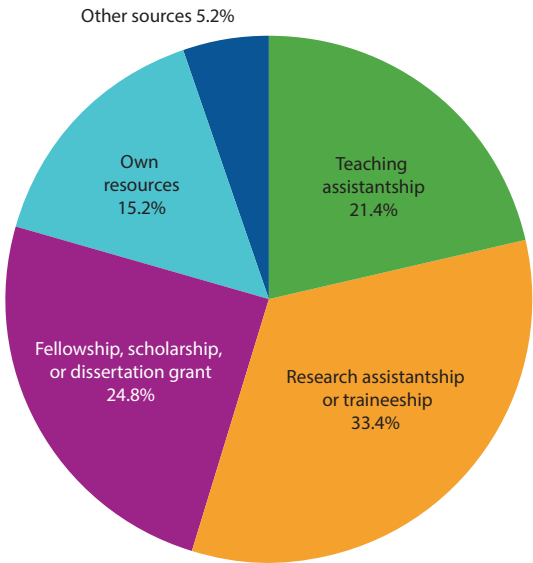
SOURCE: NCSES, Survey of Earned Doctorates, 2019.

their spouse, partner, or family—to finance their graduate studies, and 5% relied on such other sources as employer reimbursement and foreign support (figure 15).

Field of study

The primary sources of financial support used by doctorate recipients vary by field of study. In 2019, research assistantships were the most common primary source of financial support for doctorate recipients in engineering, physical sciences and earth sciences, and life sciences. In mathematics and computer sciences, teaching assistantships were slightly more frequent than research assistantships. Fellowships, scholarships, or dissertation grants and teaching assistantships were the most common source of support for comparable shares of doctoral students in humanities and arts. Nearly half of doctorate recipients in education relied on their own resources as their primary source of support. In psychology and social sciences, between 25% and 29% of doctorate recipients reported either fellowships, scholarships, or dissertation grants, teaching assistantships, or their own resources as their primary source of financial support (figure 16).

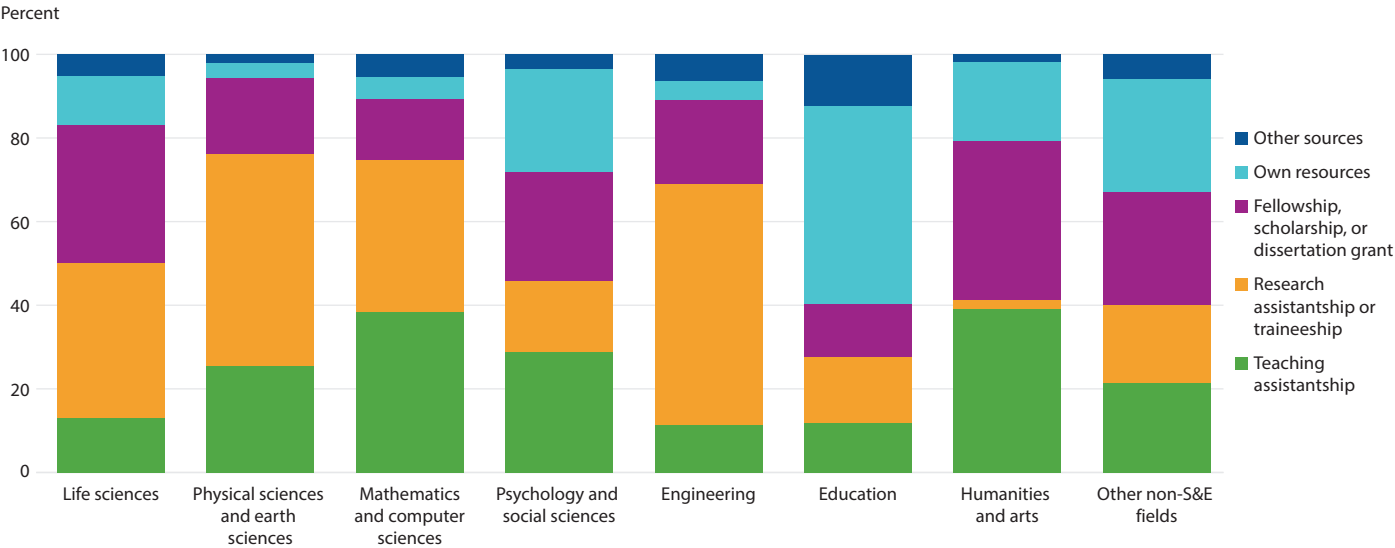
Figure 15. Primary source of financial support for doctorate recipients: 2019



NOTES: Percentages are based on the number of doctorate recipients who responded to the primary source of financial support item. Research assistantship or traineeship includes other assistantships and internships or clinical residencies. Own resources includes loans, personal savings, personal earnings outside the institution sources listed, and earnings or savings of spouse, partner, or family. Other sources includes employer reimbursement or assistance and foreign support.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 16. Primary source of financial support for doctorate recipients, by broad field of study: 2019



NOTES: Percentages are based on the number of doctorate recipients who responded to the primary source of financial support item. Research assistantship or traineeship includes other assistantships and internships or clinical residencies. Own resources includes loans, personal savings, personal earnings outside the institution sources listed, and earnings or savings of spouse, partner, or family. Other sources includes employer reimbursement or assistance and foreign support.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Graduate debt

The amount of education-related debt² incurred by doctorate recipients during graduate school is an indicator of the availability of financial support. In 2019, large majorities (71% and above) of doctorate recipients in physical sciences and earth sciences, mathematics and computer sciences, engineering, and life sciences reported holding no debt related to their graduate education when they were awarded the doctorate (figure 17). These are also fields that tend to receive the support of federal government and academic institutions in the form of research assistantships or traineeships; fellowships, scholarships, or dissertation grants; or teaching assistantships.³ In psychology and social sciences, humanities and arts, and other non-S&E fields, the share of doctorate recipients with no debt was about half; in education, it was less than half.

Within each broad field of study, 5% to 9% of doctorate recipients had incurred low levels (\$10,000 or less) of graduate debt. The shares of doctoral graduates with graduate debt burdens over \$30,000 were greatest in education (37%), psychology and social sciences (30%), other non-S&E fields (27%), and humanities and arts (24%).

In 2019, doctorate recipients in the fields with the lowest median cumulative debt—physical sciences and earth sciences, engineering, and mathematics and computer

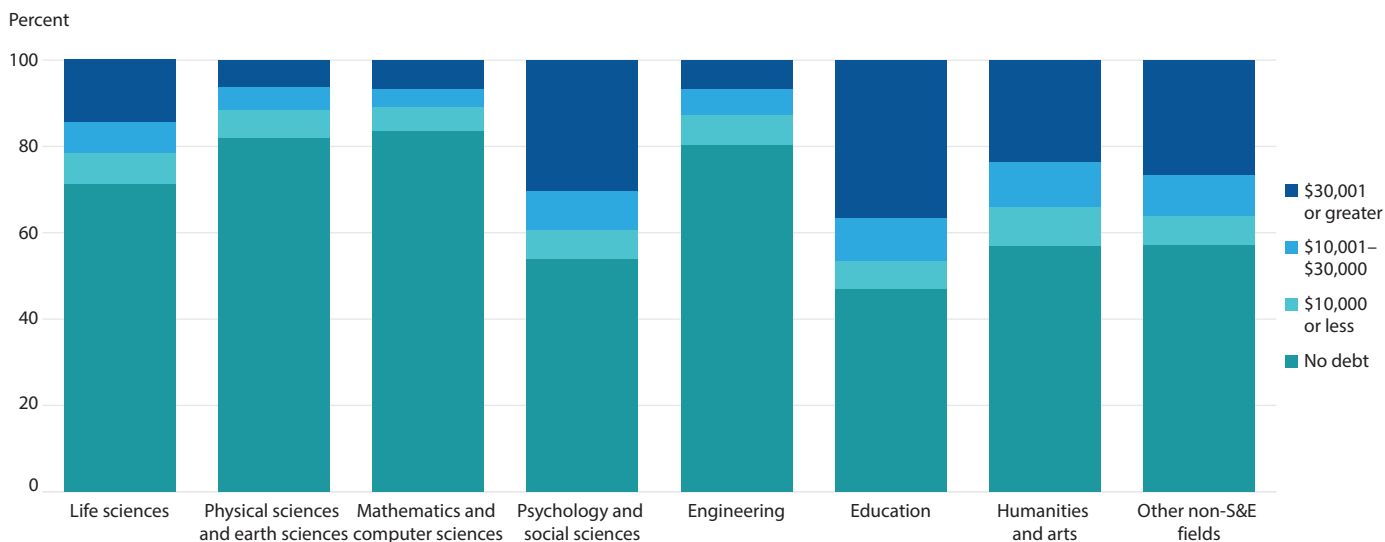
sciences—had among the highest median expected annual salaries. In these fields, median expected salaries at graduation were more than triple the median cumulative debt. Median debt among those in business management and administration was higher (\$50,000) but their median expected salary was more than double their median debt (figure 18).

In contrast, doctorate recipients in the fields with the highest median cumulative debt (psychology, social sciences, education, communication, and other non-S&E fields) reported among the lowest median expected annual salaries. In psychology, median cumulative debt was \$15,000 higher than median expected salary at graduation. In education, communication, and other non-S&E fields, doctorate recipients' median expected salary was about the same as their median cumulative debt.

Time to degree

Earning a doctorate in non-S&E fields takes years longer than completing an S&E doctorate. The longest median time to degree from graduate school entry to doctoral award is in education. Over the past 20 years, median time to degree declined slightly or remained level in most S&E fields and in humanities and arts; it fell from 14.2 to 11.9 years in education (figure 19).

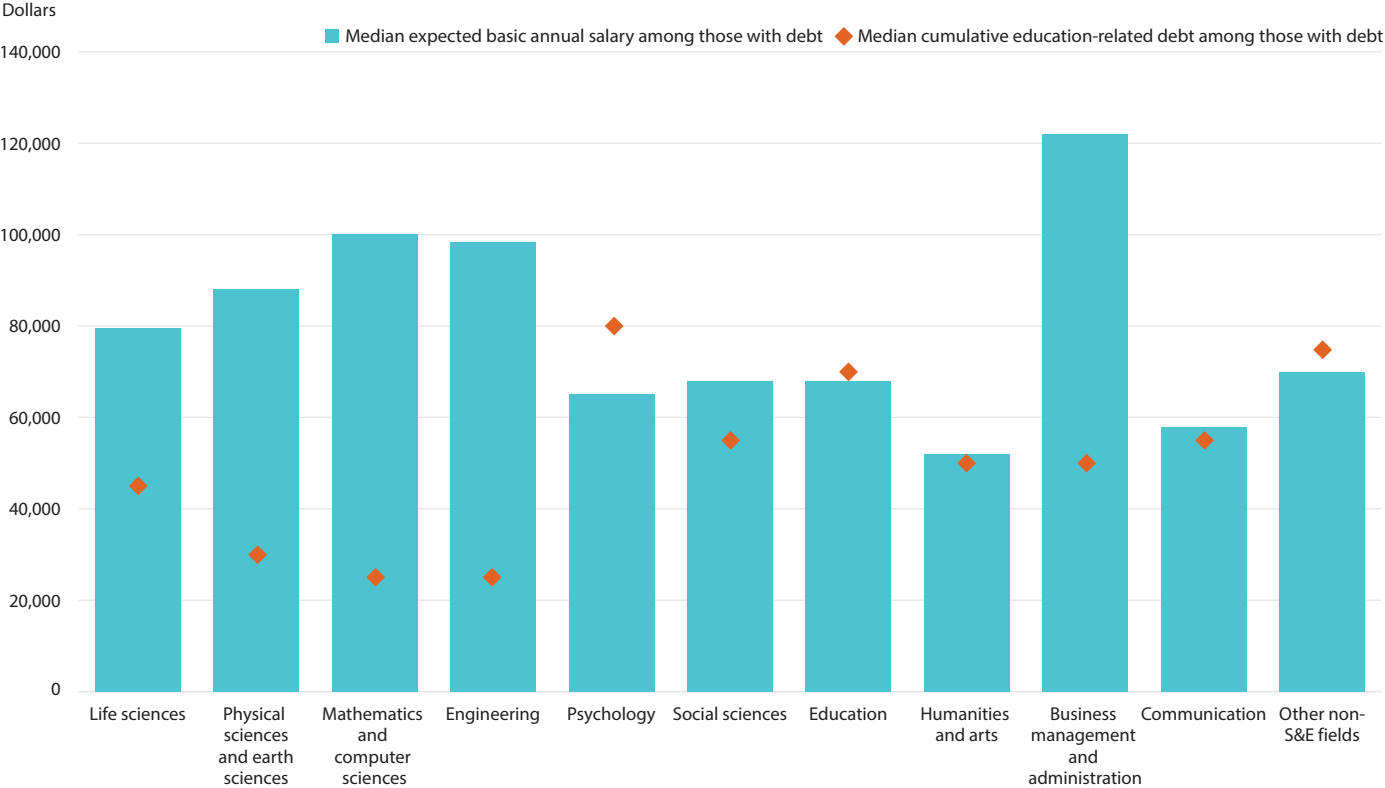
Figure 17. Graduate debt of doctorate recipients, by broad field of study: 2019



NOTE: Percentages are based on the number of doctorate recipients who responded to the graduate debt item.

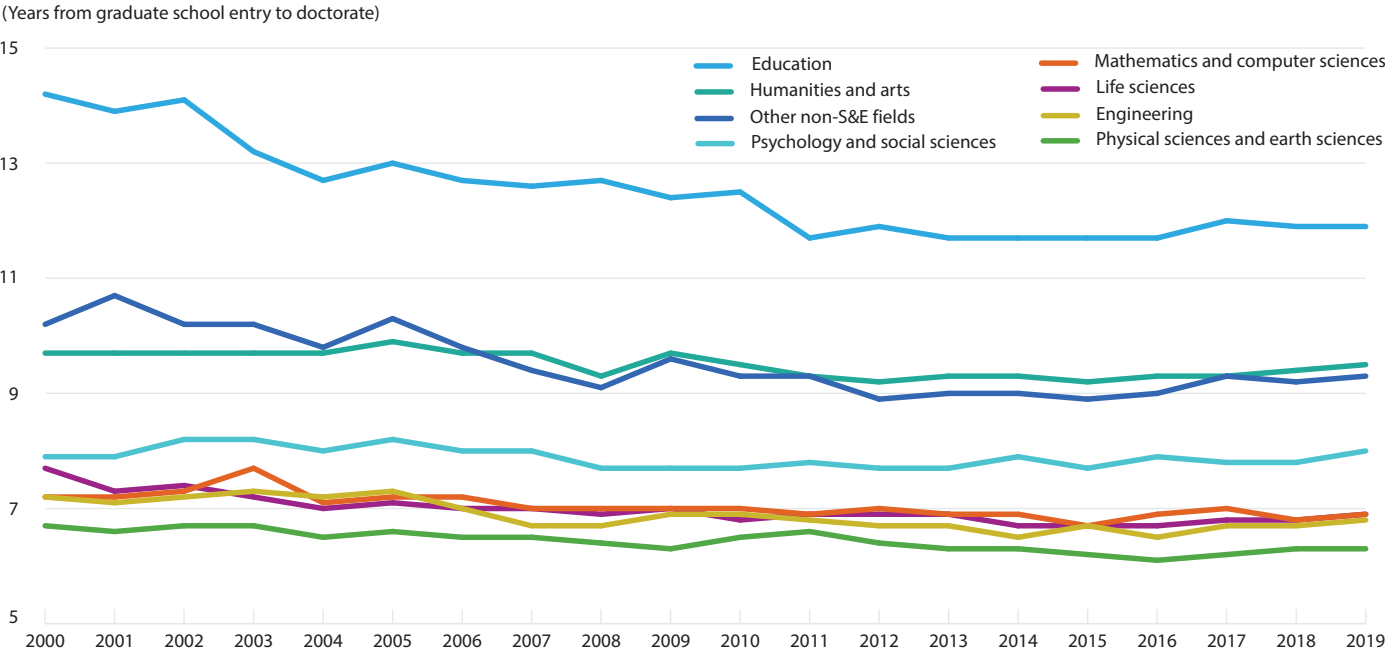
SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 18. Median expected basic annual salary and median cumulative education-related debt for debt-holding doctorate recipients with definite employment commitments in the United States, by field of study: 2019



NOTES: Definite employment commitment excludes postdoctoral study. Calculation of median debt excludes doctorate recipients reporting no debt.
 SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 19. Median time to degree of doctorate recipients, by broad field of study: 2000–19



SOURCE: NCSES, Survey of Earned Doctorates, 2019.

POSTGRADUATION TRENDS

A graduate's first position after earning the doctoral degree may reflect broad economic conditions and can shape later career opportunities, earnings, and choices. Over the longer term, the early career patterns of doctorate recipients may influence the decisions of future students considering careers as scientists, engineers, scholars, and researchers.

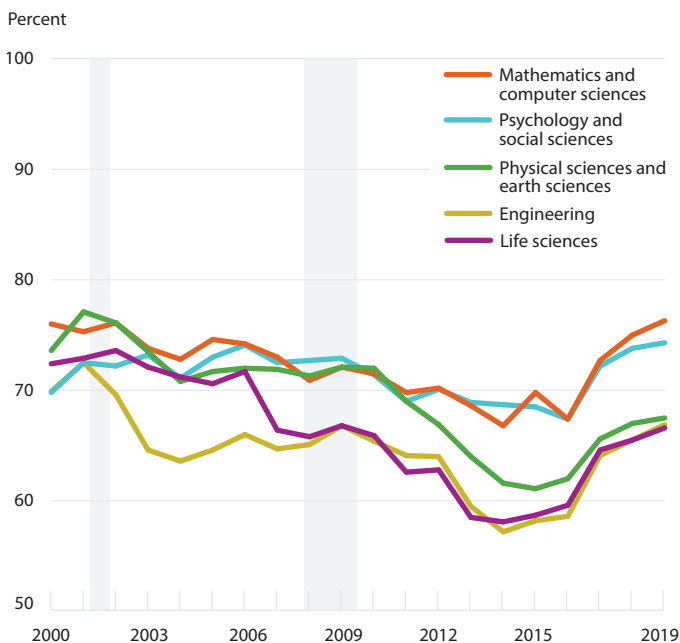
Job market

At any given time, the job market for new doctorate recipients will be better in some fields of study than in others. Though all fields tend to follow patterns that generally reflect overall trends in economic conditions, definite commitments at graduation are likely to be influenced by many factors.

In life sciences, physical sciences and earth sciences, and engineering, the proportions of doctorate recipients

reporting definite commitments, including postdoctoral positions (postdocs), have declined since 2000. These fields hit low points from about 2014 to 2016, depending on the field, but have since rebounded. In 2019, the proportion of doctorate recipients in mathematics and computer sciences and in psychology and social sciences who had definite commitments (76% and 74%, respectively) reached their highest points in the past 20 years (figure 20). Non-S&E fields similarly have recovered from lows in 2014–16 (figure 21).

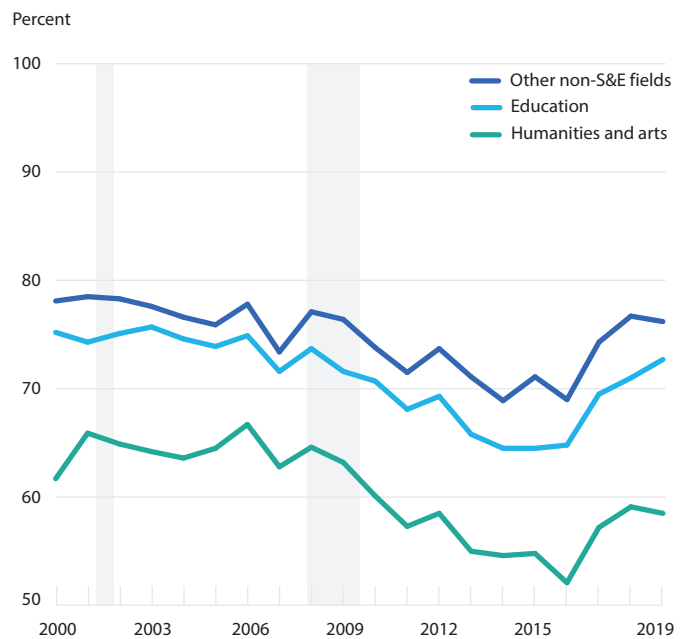
Figure 20. Definite commitments among doctorate recipients, by S&E broad field of study: 2000–19



NOTES: Shaded areas in the graphic reflect recessions that occurred between March 2001 and November 2001 and between December 2007 and June 2009. Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year. Percentages are based on the number of doctorate recipients who responded to the postgraduation status item.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 21. Definite commitments among doctorate recipients, by non-S&E broad field of study: 2000–19



NOTES: Shaded areas in the graphic reflect recessions that occurred between March 2001 and November 2001 and between December 2007 and June 2009 (<http://www.nber.org/cycles/cyclesmain.html>). Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year. Percentages are based on the number of doctorate recipients who responded to the postgraduation status item.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

First postgraduate position

Academic employment

In 2019, 41% of all doctorate recipients with definite employment commitments (excluding postdoc positions) in the United States reported that their principal job would be in academe.

The highest rates of academic employment commitments were reported by doctorate recipients in humanities and arts and in other non-S&E fields (72% and 76% respectively); the lowest rates were in engineering (12%) and in physical sciences and earth sciences (17%). In the past 20 years, the rate of academic employment commitments declined in all fields except for education, where it increased, and other non-S&E, where it remained at the same level (figure 22).

Postdoc positions

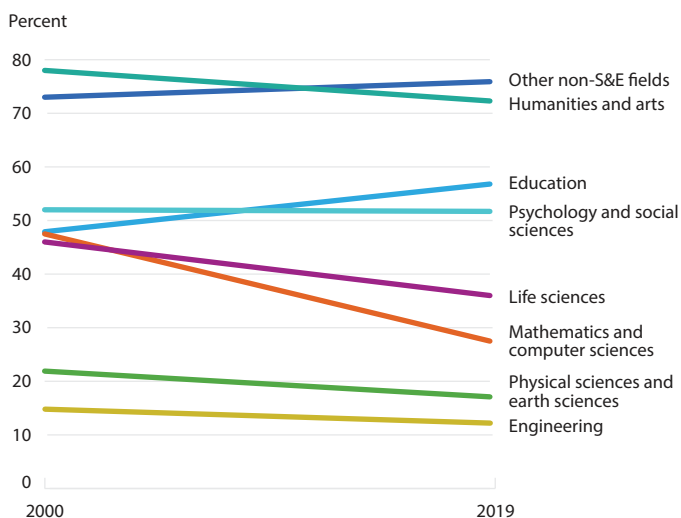
Historically, postdoc study positions have been a customary part of the early career paths of doctorate recipients in life sciences and in physical sciences and earth sciences, making up over half of definite commitments. Since 2000, postdocs also have become more prevalent in mathematics and computer sciences, psychology and social sciences, engineering, and non-S&E fields, though their rates in these fields are not as high.

In the past 10 years, the overall proportion of S&E doctorate recipients taking postdoc positions in the United States immediately after graduation declined from 55% to 46%. The proportions of doctorate recipients taking postdoc positions in life sciences, physical sciences and earth sciences, mathematics and computer sciences, and engineering declined during this period, while the proportion in psychology and social sciences and in non-S&E fields increased (figure 23).

Median salaries

In 2019, doctorate recipients who had definite commitments for a postdoc or other employed position in the United States reported that their principal job would be in academe.

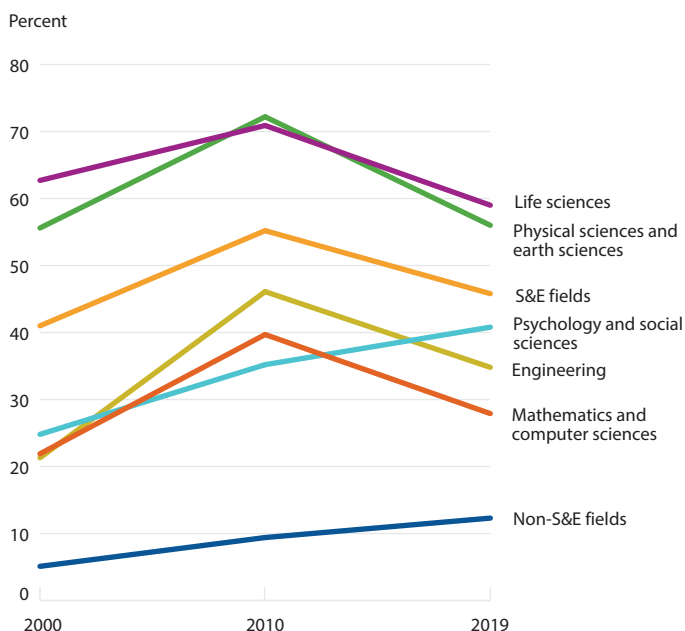
Figure 22. Definite employment commitments in academe in the United States, by broad field of study: 2000 and 2019



NOTES: Definite employment commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment other than a postdoctoral position in the coming year. Percentages are based on the number of doctorate recipients who reported definite commitments (including those missing employer type) and plans to stay in the United States.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 23. U.S. postdoctorate rate for doctorate recipients, by broad field of study: Selected years, 2000–19

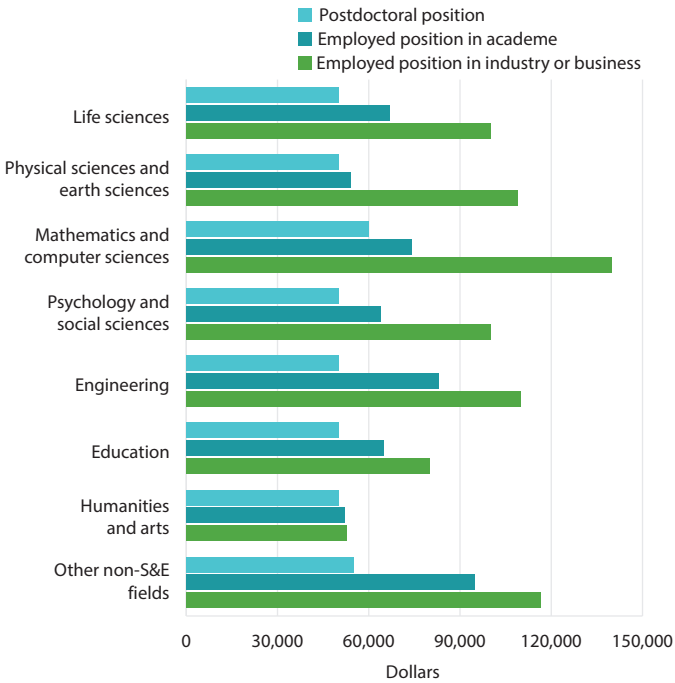


NOTE: Percentages are based on the number of doctorate recipients who reported definite commitments in the coming year, who reported whether their commitment was for postdoctoral study or other employment, and who plan to live in the United States.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

in humanities and arts, salaries were similar regardless of sector. The median salaries for postdocs in all broad fields were relatively similar, ranging from \$50,000 to \$55,000, except for postdocs in mathematics and computer sciences, who had a median salary of \$60,000. Doctorate recipients in engineering and those in other non-S&E fields, such as business, reported the highest median academic salaries (\$83,000 and \$95,000, respectively). Those in mathematics and computer sciences, in engineering, and in other non-S&E fields reported the highest median salaries in industry positions (\$140,000, \$110,000, and \$117,000, respectively) (figure 24).

Figure 24. Median expected basic annual salary of doctorate recipients with definite commitments in the United States, by position type and broad field of study: 2019

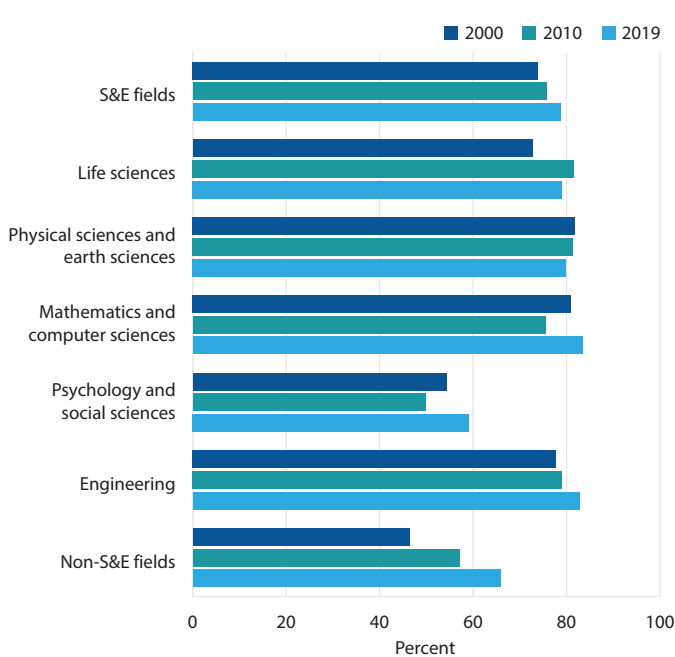


NOTES: Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year and plans to stay in the United States. Industry includes all nonacademic sectors, including self-employment, private for-profit and private nonprofit, and government.
SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Temporary visa holders and postgraduation

In 2019, 79% of temporary visa holder doctorate recipients in S&E fields with definite commitments reported that the location of their postdoc or other employment position was in the United States, up from 74% in 2000. Expected stay rates were highest in fields where temporary visa holders were more heavily represented: mathematics and computer sciences, engineering, life sciences, and physical sciences and earth sciences (figure 25).

Figure 25. Temporary visa holder doctorate recipients with definite commitments in the United States, by broad field of study: Selected years, 2000–19



NOTES: Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment, including postdoctoral study, in the coming year. Percentages are based on the number of temporary visa holders who reported definite commitments and plans to stay in the United States.
SOURCE: NCSES, Survey of Earned Doctorates, 2019.

SPECIAL FOCUS: EDUCATIONAL PATHWAYS TO THE DOCTORATE

There are many educational pathways to the doctoral degree. This section explores additional details of doctorate recipients’ educational journeys, including other degrees doctorate recipients attained, prior attendance at community colleges, the types of institutions in which doctorate recipients earned bachelor’s degrees, and whether doctorate recipients changed their field of study between their bachelor’s or master’s degrees and their doctorate.

Degree awards obtained by doctorate recipients

The path to the doctorate starts in undergraduate institutions. Just 4% of 2019 doctorate recipients had earned an associate’s degree, while nearly all had earned at least one bachelor’s degree (96%). The majority had earned one master’s degree (59%) and 11% had earned more than one master’s degree prior to their doctorate. For virtually all 2019 doctorate recipients, their current doctorate was their first research doctoral award (table A).

Earning a professional doctoral degree concurrently or prior to the doctorate was not common (table B). Only 1% of doctorate recipients were earning a professional degree simultaneously; 2% had earned a professional degree before starting their doctoral program. For the most part, these professional degrees were medical degrees.

Table A. Degrees earned by doctorate recipients before their doctoral award, by degree level: 2019

Degree level	One prior degree at this level	Two or more prior degrees at this level
Associate's	3.9	0.4
Bachelor's	91.7	4.5
Master's	58.8	11.2
Another research doctorate	*	0.0

* = value < 0.05%.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Table B. Doctorate recipients earning professional doctoral degrees: 2019

Professional doctoral degrees	Number	Percent
Currently earning	632	1.3
Earned prior to the research doctorate	777	1.6
No professional doctorate	47,961	97.1

NOTE: Percentages are based on the number of doctorate recipients responding to the item on the professional doctorate degrees.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

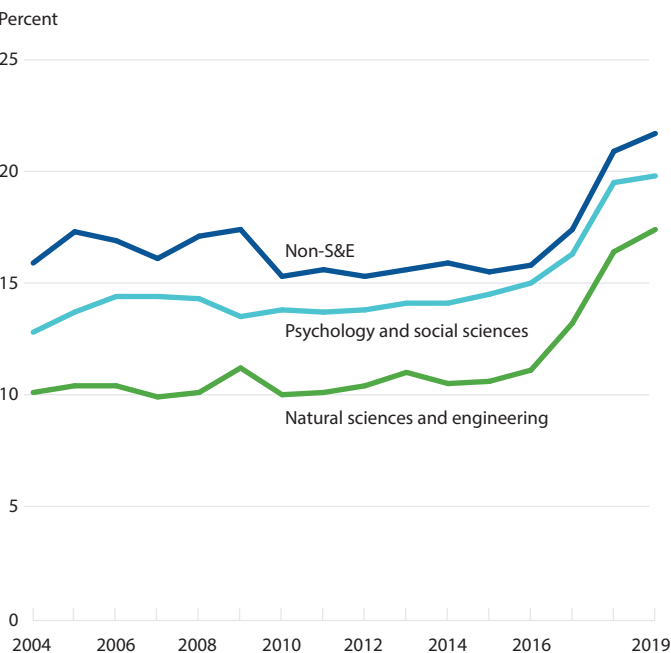
Community or 2-year college attendance and associate’s degree attainment

Time trend and field differences

The proportion of doctorate recipients who had attended community college has been gradually increasing in all broad areas of study in the past 4–5 years (figure 26). It is measured as the proportion who had earned college credit from a community or 2-year college. Doctorate recipients in non-S&E fields are slightly more likely to have attended community college than those in S&E fields. Only a fraction of the doctorate recipients who attended community college had earned an associate’s degree (figure 27).

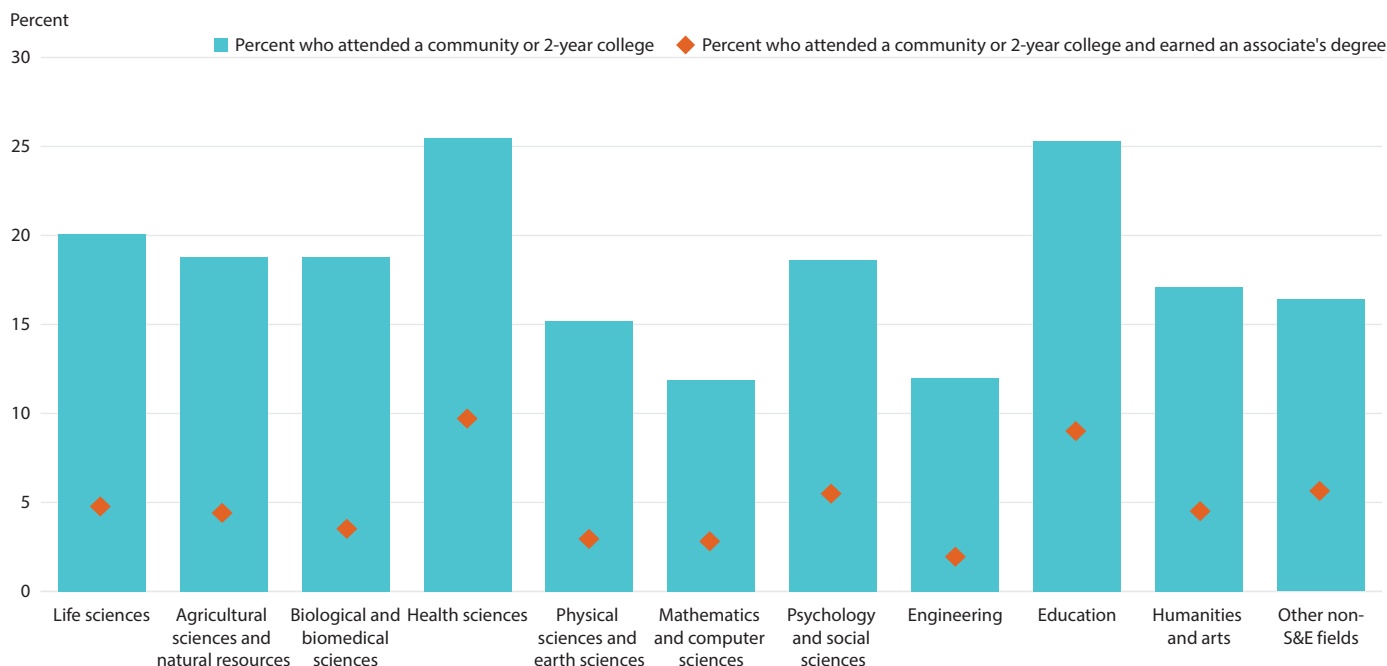
Doctorate recipients in the health sciences and in education were the most likely to have attended community college (26% and 25%, respectively) and also the most likely to have

Figure 26. Doctorate recipients who earned college credit at a community or 2-year college, by area of study: 2004–19



SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 27. Doctorate recipients who earned college credit at a community or 2-year college and who earned an associate's degree, by field of study: 2017–19



NOTE: Agricultural sciences and natural resources, biological and biomedical sciences, and health sciences are major fields within the broad field of life sciences.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

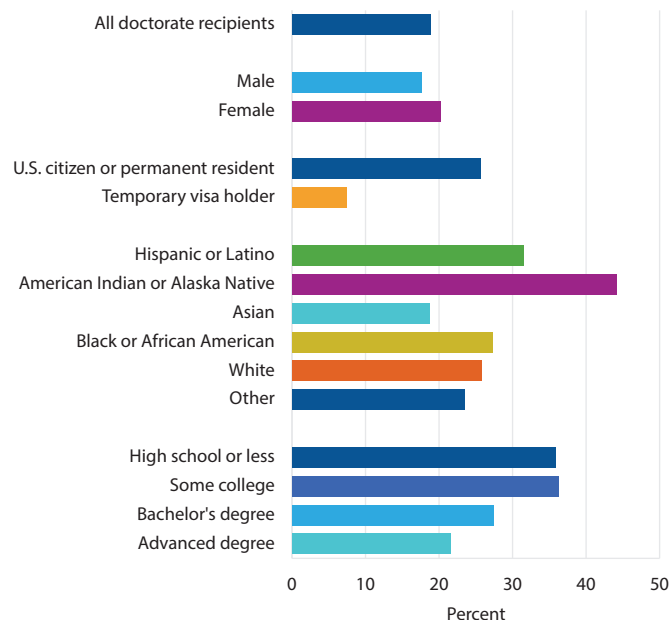
earned an associate's degree (10% and 9%, respectively). Doctorate recipients in engineering and in mathematics and computer sciences were the least likely to have earned college credit from a community college (12% each) or an associate's degree (2% and 3%, respectively).

Demographics and parental education

U.S. citizens and permanent residents are more than three times as likely as temporary visa holders to have attended a community college (figure 28). Among U.S. citizens and permanent residents, nearly a third of Hispanic or Latino and nearly half of American Indian or Alaska Native doctorate recipients had earned college credit from this type of institution. Asian doctorate recipients were the least likely to have attended community college (19%).

Community college attendance among U.S. citizen and permanent resident doctorate recipients varied by the educational attainment of their parents. Generally, community college attendance was higher at the lower parental educational attainment levels. For doctorate recipients whose parents had completed some college or less, about a third attended community college, compared with 27% for doctorate recipients whose parents had earned a bachelor's degree and 22% for those whose parents had earned an advanced degree.

Figure 28. Doctorate recipients with college credit at a community or 2-year college, by sex, citizenship status, race and ethnicity, and highest parental educational attainment: 2019



NOTES: Percentages for sex and citizenship status are based on total number of doctorate recipients. Percentages for race and ethnicity and highest parental educational attainment are based on U.S. citizens and permanent residents only. Other race or ethnicity includes more than one race, other race or race not reported, and ethnicity not reported. Advanced degree includes master's degree, professional degree, and research doctorate.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Baccalaureate origins of doctorate recipients

Type of baccalaureate institution

Both U.S. research institutions and foreign institutions play important roles in the baccalaureate education of U.S.-trained doctorates (table C). In 2019, about 91% of doctorate recipients who were U.S. citizens or permanent residents had earned their bachelor's degree in the United States. In turn, nearly 90% of doctorate recipients who were temporary visa holders had obtained their baccalaureate abroad.

Among S&E doctorate recipients who earned their bachelor's in the United States, universities with very high research activity and baccalaureate colleges were the most frequent baccalaureate institutions of doctorates recipients, when adjusted by the number of bachelor's degrees awarded in all fields by different types of academic institutions—the institutional yield ratio, see glossary⁴ (figure 29). For example, for every 100 individuals who earned their bachelor's degree in 2011 from a very high research activity university, 2.8 of them are estimated to have completed an S&E doctorate in 2019; the number is 1.9 from baccalaureate colleges and 1.4 or fewer for other types of institutions.

Baccalaureate origins in HBCUs

Although the number of Black or African American doctorate recipients who had earned a bachelor's degree from a U.S. institution grew from 1,575 in 1999 to 2,210 in 2019, the number of those with a baccalaureate from a historically Black college or university (HBCU, see glossary) only grew from 493 to 508 in the same period (figure 30). As a result, the proportion of Black or African American doctorate recipients with baccalaureate degrees from HBCUs declined, both in S&E and non-S&E fields. The number of

Table C. Location of baccalaureate-origin institution for doctorate recipients, by citizenship and field of study: 1999 and 2019

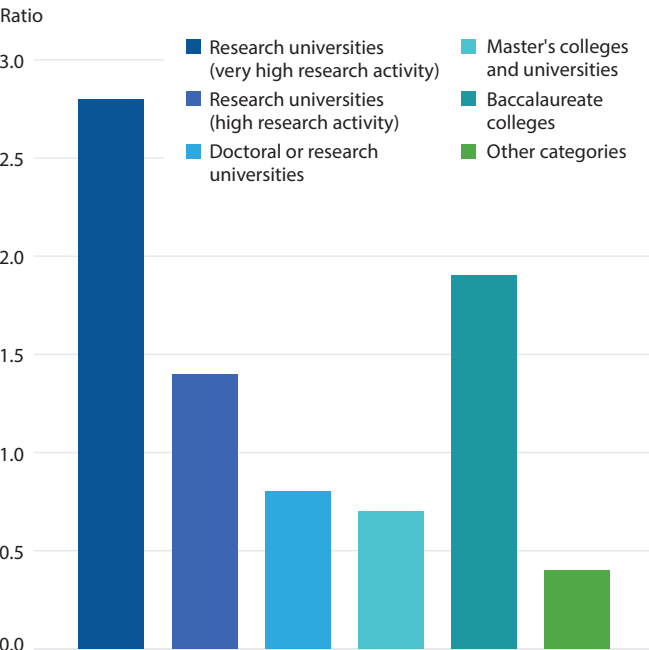
(Percent)

Location of baccalaureate-origin institution	U.S. citizens and permanent residents				Temporary visa holders			
	S&E		Non-S&E		S&E		Non-S&E	
	1999	2019	1999	2019	1999	2019	1999	2019
All doctorate recipients (number)	18,472	25,718	11,840	9,556	7,505	15,801	1,555	2,550
United States	88.1	91.1	90.8	91.1	6.4	8.9	8.4	8.6
Foreign country	8.8	7.8	4.8	7.2	83.7	89.1	79.8	88.1
Other or unknown	3.0	1.1	4.4	1.8	10.0	2.0	11.8	3.3

NOTE: Excludes respondents who did not report citizenship.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

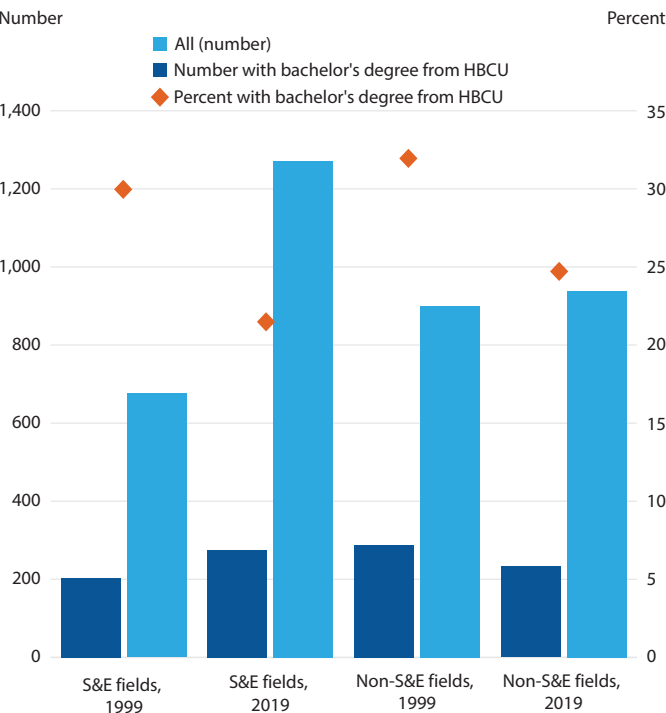
Figure 29. Institutional yield ratios based on S&E doctorate recipients, by 2010 Carnegie Classification of U.S. baccalaureate institution: 2019



NOTES: Institutional yield ratio is the number of S&E doctorate recipients per 100 bachelor's degrees awarded 8 years earlier. In S&E fields, 8 years is the median time to the doctoral degree since the bachelor's degree.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 30. U.S. citizen and permanent resident Black or African American doctorate recipients with bachelor's degrees from an HBCU, by field of study: 1999 and 2019



HBCU = historically Black college or university.

NOTE: Excludes doctorate recipients with bachelor's degrees from non-U.S. institutions.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

HBCUs is determined by law and generally constant over time while the overall number of Black or African American undergraduate students has increased.⁵

Baccalaureate origins in HHEs

In the past 20 years, the number of Hispanic or Latino doctorate recipients who had earned a bachelor’s degree from a U.S. institution more than doubled to 2,578, and the number of those with a bachelor’s degree from a high-Hispanic-enrollment institution (HHE, see glossary) more than tripled to 939 (figure 31). Consequently, the proportion of Hispanic or Latino doctorate recipients with baccalaureates from an HHE increased, both in S&E and in non-S&E fields. Unlike HBCUs, the number of HHEs has increased over time, parallel with Hispanic or Latino undergraduate enrollment.

Doctorate recipients with master’s degrees

Time trends in master’s degree by field

In most fields, the majority of doctorate recipients earned a master’s degree before their doctorate (figure 32). Doctorate recipients in the biological and biomedical sciences are the exception; 41% of those graduating in 2017–19 had earned a master’s degree on their path to the doctorate. In contrast, more than 80% of doctorate recipients in psychology and social sciences and in non-S&E fields had earned a master’s degree.

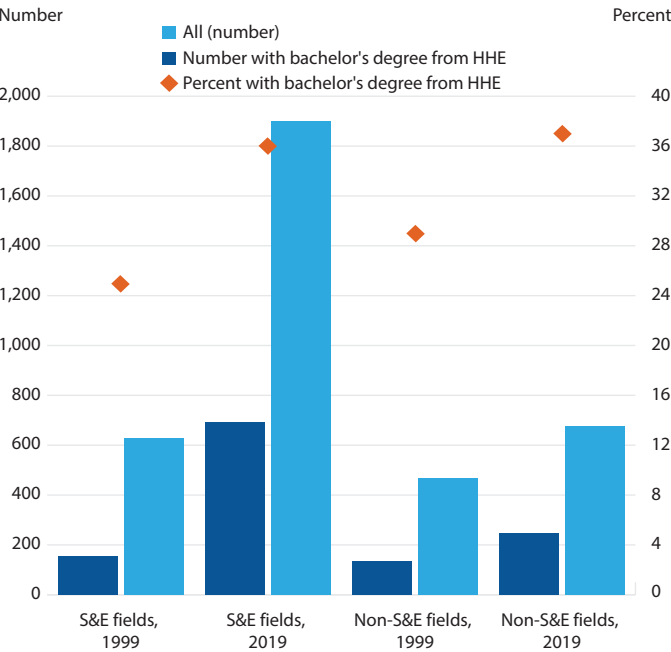
In most fields, the proportion of doctorate recipients who had earned a master’s on their way to their doctorate remained similar when compared with the proportion in the late 1990s. However, in engineering and in agricultural sciences and natural resources this proportion declined by 10%.

Field switching between degree levels

In general, doctorate recipients are more likely to hold doctoral and master’s degrees in the same field than to hold doctoral and bachelor’s degrees in the same field. However, S&E doctorate recipients are more likely than their counterparts in non-S&E fields to remain in the same bachelor’s and master’s field.

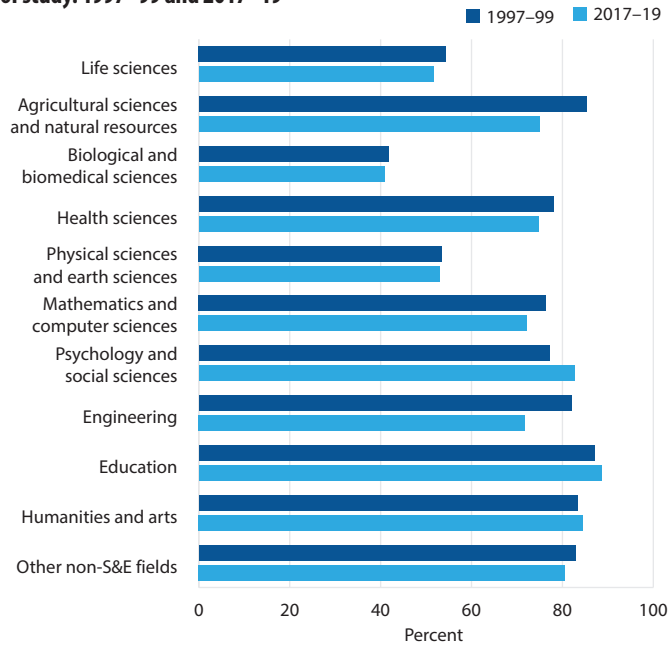
Among doctorate recipients who earned their doctorate degree in 2017–19, 61% of S&E doctorate recipients remained in the same field as their baccalaureate, compared with 38% of non-S&E doctorate recipients (figure 33). Eighty percent of S&E doctorate recipients stayed in the same field as their master’s degree, compared with 73% of those in non-S&E fields.

Figure 31. U.S. citizen and permanent resident Hispanic or Latino doctorate recipients with bachelor’s degrees from an HHE, by field of study: 1999 and 2019



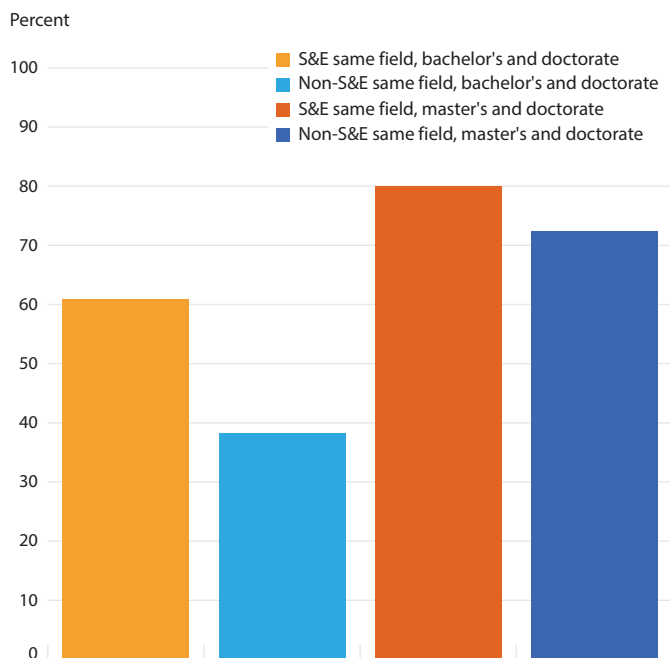
HHE = high-Hispanic-enrollment institution.
 NOTES: Excludes doctorate recipients with bachelor’s degrees from non-U.S. institutions. HHEs are defined by the U.S. Department of Education as nonprofit public and private institutions of higher education whose full-time equivalent enrollment of undergraduate students is at least 25% Hispanic, according to data institutions report in the Integrated Postsecondary Education Data System (IPEDS) Fall Enrollment Survey. The 1999 data use the 1998 Fall Enrollment survey, and the 2019 data use the 2019 Fall Enrollment survey.
 SOURCES: NCSES, Survey of Earned Doctorates, 2019 and National Center for Education Statistics, IPEDS Fall Enrollment Survey, 1998 and 2019.

Figure 32. Doctorate recipients who had earned a master’s degree, by field of study: 1997–99 and 2017–19



NOTE: Life sciences includes agricultural sciences and natural resources, biological and biomedical sciences, and health sciences.
 SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 33. Doctorate recipients who stayed in the same field of study as their bachelor's or master's degrees: 2017–19



NOTES: Percentages for same field in bachelor's degree and doctorate are based on the total number of doctorates. Percentages for same field in master's degree and doctorate are based on the number of doctorate recipients who reported earning a master's degree. A bachelor's or master's degree is counted as in the "same field" as the doctorate if the first or most recent bachelor's or master's degree and doctorate are in the same major field, except for engineering and education, where only the broad field needs to match.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

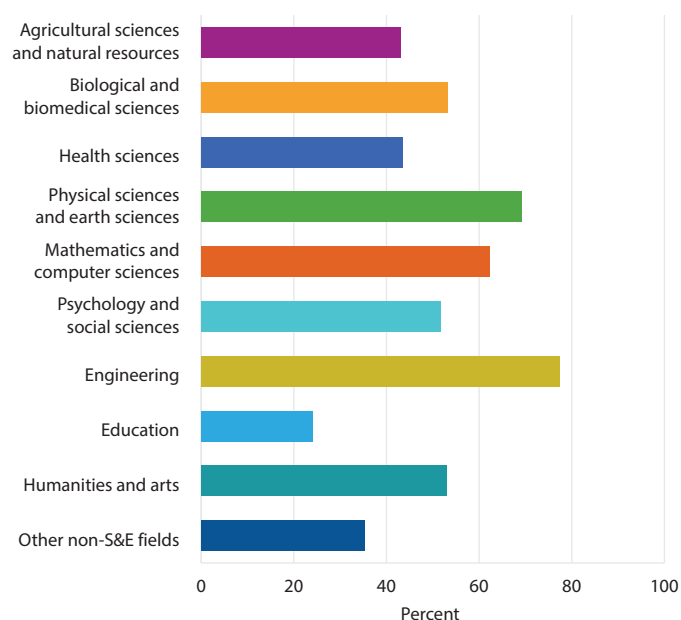
Field switching between bachelor's and doctoral degrees

In 2017–19, the proportion of doctorate recipients who remained in the same field as their bachelor's degree was highest in engineering (77%), physical sciences and earth sciences (69%), and mathematics and computer sciences (62%) (figure 34). In contrast, less than a quarter of those in education remained in the same field, possibly because a doctorate in education adds competencies that supplement prior degrees in subject-area fields.

Field switching between master's and doctoral degrees

For all fields in 2017–19, the majority of the doctorate recipients remained in the same field as their master's degree. However, the proportion was highest among those in engineering (90%), followed by those in mathematics and computer sciences (84%), physical sciences and earth sciences (84%), humanities and arts (80%), and psychology and social sciences (79%) (figure 35).

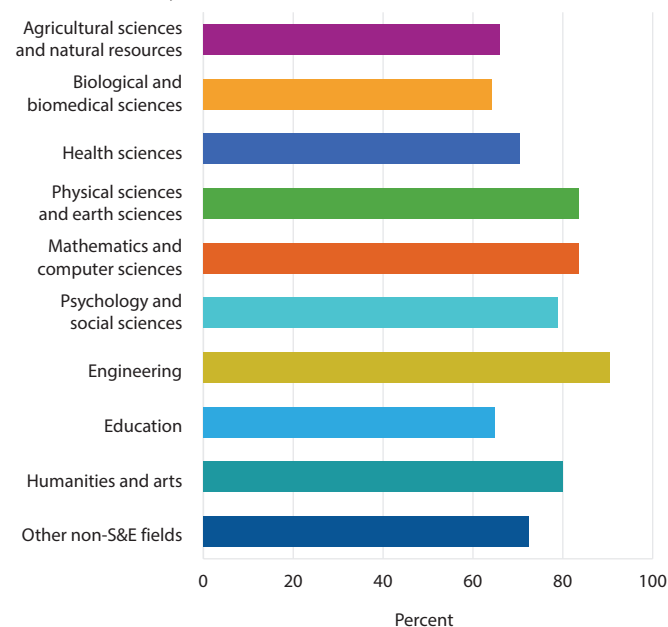
Figure 34. Doctorate recipients with bachelor's and doctoral degrees in the same field of study: 2017–19



NOTES: Agricultural sciences and natural resources, biological and biomedical sciences, and health sciences are major fields within the broad field of life sciences. Percentages are based on the total number of doctorates. A bachelor's degree is counted as in the "same field" as the doctorate if the first or most recent bachelor's degree and doctorate are in the same major field, except for engineering and education, where only the broad field needs to match.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 35. Doctorate recipients with master's and doctoral degrees in the same field of study: 2017–19



NOTES: Agricultural sciences and natural resources, biological and biomedical sciences, and health sciences are major fields within the broad field of life sciences. Percentages are based on the number of doctorate recipients who reported earning a master's degree. A master's degree is counted as in the "same field" as the doctorate if the first or most recent master's degree and doctorate are in the same major field, except for engineering and education, where only the broad field needs to match.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Field switching between degree levels by demographics

Baccalaureate and doctoral field

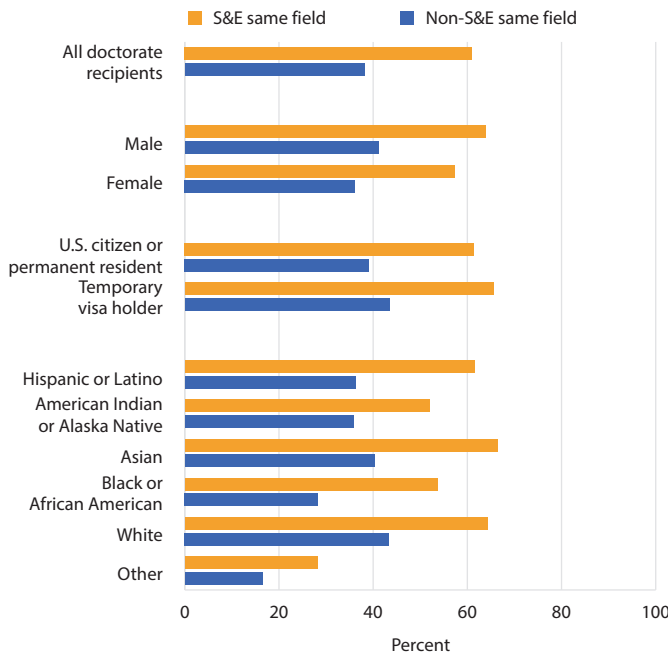
Among doctorates in both S&E and in non-S&E fields, men, temporary visa holders, and White, Asian, and Hispanic or Latino doctorate recipients were more likely than their respective counterparts to have stayed in the same field as their baccalaureate (figure 36).

Master's and doctoral field

Although S&E doctorate recipients were more likely than those in non-S&E to have earned a master's in the same field

as their doctorate, U.S. citizens and permanent residents were as likely as temporary visa holders to have remained in the same field as their master's, regardless of field of study. Among S&E doctorates, White, Asian, and Hispanic or Latino doctorate recipients were more likely to stay in the same S&E field as their master's degree than Black or African American and American Indian or Alaska Native doctorate recipients (figure 37). Among non-S&E doctorates, White and Asian doctorate recipients were the most likely to have stayed in the same field and Black or African American doctorate recipients the least likely to do so.

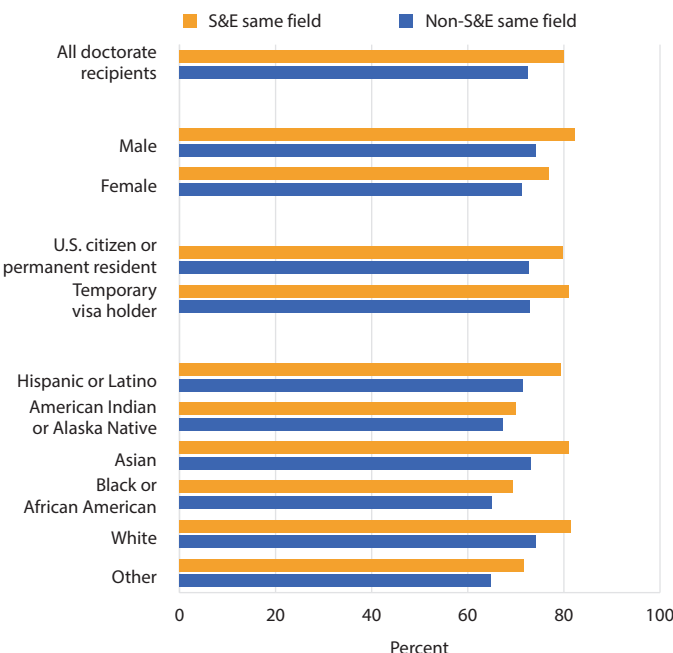
Figure 36. Doctorate recipients with bachelor's and doctoral degrees in the same field of study, by sex, citizenship status, and race and ethnicity: 2017–19



NOTES: All doctorate recipients includes respondents who did not report sex, citizenship, race, or ethnicity. Race and ethnicity categories include U.S. citizens, permanent residents, and temporary visa holders. Other race or ethnicity includes more than one race, other race or race not reported, and ethnicity not reported. A bachelor's degree is counted as in the "same field" as the doctorate if the first or most recent bachelor's degree and doctorate are in the same major field, except for engineering and education, where only the broad field needs to match.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

Figure 37. Doctorate recipients with master's and doctoral degrees in the same field of study, by sex, citizenship status, and race and ethnicity: 2017–19



NOTES: All doctorate recipients includes respondents who did not report sex, citizenship, race, or ethnicity. Race and ethnicity categories include U.S. citizens, permanent residents, and temporary visa holders. Other race or ethnicity includes the categories more than one race, other race or race not reported, and ethnicity not reported. Percentages for same field in master's degree and doctorate are based on the number of doctorate recipients who reported earning a master's degree. A master's degree is counted as in the "same field" as the doctorate if the first or most recent master's degree and doctorate are in the same major field, except for engineering and education, where only the broad field needs to match.

SOURCE: NCSES, Survey of Earned Doctorates, 2019.

DATA SOURCE

The Survey of Earned Doctorates (SED) is the sole data source for *Doctorate Recipients from U.S. Universities: 2019*. The principal elements of the 2019 SED data collection are described in the sections that follow. More detailed information and related technical tables are available at <https://nces.nsf.gov/sed/>.

Survey eligibility. The SED collects information on research doctorate recipients only. Research doctorates require the completion of a dissertation or equivalent project, are oriented toward preparing students to make original intellectual contributions in a field of study, and are not primarily intended for the practice of a profession. The 2019 SED recognized 18 distinct types of research doctorates. In 2019, 98% of research doctorate recipients earned the PhD.

Survey universe. The population eligible for the 2019 survey consisted of all individuals who received a research doctorate from an accredited U.S. academic institution in the 12-month period from 1 July 2018 to 30 June 2019. The total universe consisted of 55,703 persons in 448 institutions that conferred research doctorates in academic year 2019.

Data collection. Institutional coordinators at each doctorate awarding institution distributed the SED Web survey link (or paper survey form) to individuals receiving a research doctorate. Nonresponding graduates were contacted by e-mail, mail, or phone to request response to the survey. RTI International served as the 2019 SED data collection contractor on behalf of NCSES.

Survey response rates. In 2019, 92.1% of research doctorate recipients completed the survey. Limited records (field of study, doctoral institution, and sex) are constructed for nonrespondents from administrative records of the university—commencement programs, graduation lists, and other public records—and are included in the reported total of doctorate recipients. The survey response rates for 1980–2019 and the item response rates for 2010–19 are provided in the technical tables (<https://nces.nsf.gov/pubs/nsf21308/>).

Time series data changes. After a multiyear review of Doctor of Education (EdD) degree programs participating in the SED, 143 programs were reclassified from research doctorate to professional doctorate over the 2010–11 period. No additional reclassifications of EdD degree programs are planned. SED data are no longer being collected from graduates earning degrees from the reclassified EdD programs, and this has affected the reporting of the number of doctorates awarded by sex, citizenship, race, and ethnicity. Several figures in this report show the impact of the decline in number of doctoral degrees awarded in education from 2009 to 2011 (see figure 8 and figure 12 in the section “Fields of study,” and figure 22 in the section “Postgraduation trends”). Readers should note that the declines from 2009 to 2010 and from 2010 to 2011 are at least partly attributable to the EdD reclassification.

Data license. Microdata from the SED may be obtained through a restricted-use data license (see <https://nsf.gov/statistics/license/index.cfm>).

GLOSSARY

Area of study: See *Field of study*.

Basic annual salary. Annual salary to be earned from the doctorate recipient's principal job in the next year, not including bonuses or additional compensation for summertime teaching or research.

Cumulative debt. The amount of debt, incurred both at the undergraduate level and the graduate level, owed by a doctorate recipient at the time the doctorate is awarded.

Carnegie Classification. The Carnegie Classification of Institutions of Higher Education is a commonly used classification of postsecondary institutions based on level of degree awarded, fields in which degrees are conferred, and, in some cases, enrollment, federal research support, and selectivity of admissions criteria. The categories used here are from the 2010 classification framework and include research universities (very high research activity); research universities (high research activity); doctoral or research universities; master's colleges and universities; baccalaureate colleges; and other colleges and universities, such as associate's colleges, special focus institutions (e.g., medical schools and medical centers, schools of engineering, business and management), and tribal colleges. For details, see <http://carnegieclassifications.iu.edu/>.

Definite commitment. A commitment, through a contract or other method, by doctorate recipients to accept employment, including a postdoc study position, in the coming year or to return to predoctoral employment.

Definite employment commitment. A definite commitment by doctorate recipients for employment in a non-postdoc position in the coming year.

Field of study. The Survey of Earned Doctorates (SED) collects data on 331 fields of doctoral study. For reporting purposes, these fields are typically grouped into 35 major fields and further aggregated into eight broad fields: life sciences; physical sciences and earth sciences; mathematics and computer sciences; psychology and social sciences; engineering; education; humanities and arts; and other non-science and engineering fields. For comparative purposes in the section "Special Focus: Educational Pathways to the Doctorate," this report uses an additional area of study grouping for natural sciences, which includes life sciences, physical sciences and earth sciences, and mathematics and computer sciences.

See technical table A-6 in the online resources of this report for a listing of the major fields within each broad field category. See the survey questionnaire for a full listing of the fine fields of study (<https://nces.nsf.gov/sed/>).

Graduate debt. The amount of debt from graduate-level education owed by a doctorate recipient at the time the doctorate is awarded.

Historically Black colleges and universities (HBCUs). Academic institutions listed by the White House Initiative on Historically Black Colleges and Universities. The Higher Education Act of 1965, as amended, defines an HBCU as "any historically Black college or university that was established prior to 1964, whose principal mission was, and is, the education of Black Americans, and that is accredited by a nationally recognized accrediting agency or association determined by the Secretary [of Education] to be a reliable authority as to the quality of training offered or is, according to such an agency or association, making reasonable progress toward accreditation." See <https://sites.ed.gov/whhbcu/one-hundred-and-five-historically-black-colleges-and-universities>.

High-Hispanic-enrollment institutions (HHEs). Nonprofit public and private institutions of higher education whose full-time equivalent (FTE) enrollment of undergraduate students is at least 25% Hispanic. The FTE enrollment of Hispanic students is determined by enrollment data that institutions reported to the fall 2019 Integrated Postsecondary Education Data System (IPEDS) Enrollment survey conducted by National Center for Education Statistics (NCES). NCES determined FTE enrollment by estimating that approximately three part-time students are equivalent to one full-time student. Because IPEDS does not collect part-time credit hour information, the FTE numbers are only an approximation. The list includes only nonprofit public and private institutions of higher education.

Institutional yield ratio. Number of S&E doctorate recipients per 100 bachelor's degrees awarded 8 years earlier. In S&E fields, 8 years is the median time to the doctoral degree since the bachelor's award.

NCSES. National Center for Science and Engineering Statistics.

Non-S&E. Non-science and engineering: A grouping of broad fields of study that includes education, humanities and arts, and other non-S&E fields, such as business.

Parental educational attainment. The highest level of education attained by either parent of a doctorate recipient.

Postdoctoral (postdoc) position. As defined in the questionnaire, a temporary position primarily for gaining additional education and training in research, usually awarded in academe, industry, government, or a nonprofit organization.

Postdoctorate rate. The proportion of doctorate recipients who have definite commitments for a postdoc position among all doctorate recipients with definite commitments in the coming year, who reported whether their commitment was for postdoc study or other employment, and who plan to live in the United States.

Race and ethnicity. Doctorate recipients who report Hispanic or Latino heritage, regardless of racial designation, are counted as Hispanic or Latino, and as of 2013, those who do not answer the Hispanic or Latino ethnicity question are counted as “ethnicity not reported.” Respondents who indicate that they are not Hispanic or Latino and indicate a single race are reported in their respective racial groups, except for those indicating Native Hawaiian or Other Pacific Islander, who are included in “other race or race not reported.” Beginning in 2001, respondents who are not Hispanic or Latino and who indicate more than one race are reported in the category “more than one race.” Data for this category were not collected before 2001. Before 2001, respondents who are not Hispanic or Latino and who indicate more than one race were categorized as “other or unknown.” For 2001 and later data, the “other or unknown” category includes doctorate recipients who indicated that they were not Hispanic or Latino and either did not respond to the race item or reported their race as Native Hawaiian or Other Pacific Islander. For 2000 and earlier data, Native Hawaiians or Other Pacific Islanders are counted in the Asian group.

Research doctorate. A doctoral degree that is oriented toward preparing students to make original intellectual contributions in a field of study and that is not primarily intended for the practice of a profession. Research doctorates require the completion of a dissertation or equivalent project. In this report, the terms “doctorate” and “doctoral degree” are used to represent any of the research doctoral degrees covered by the survey. Professional doctoral degrees, such as the MD, DDS, JD, and PsyD, are not covered by the Survey of Earned Doctorates.

S&E. Science and engineering: A grouping of broad fields of study that includes science (life sciences, physical sciences and earth sciences, mathematics and computer sciences, psychology and social sciences) and engineering fields.

Sources of financial support. Sources of financial support are grouped into the following five categories: fellowships (includes scholarships and dissertation grants); teaching assistantships; research assistantships (includes traineeships, internships, clinical residencies, and other assistantships); own resources (includes loans, personal savings, personal earnings, and earnings or savings of spouse, partner, or family); and other (includes employer reimbursements and support from non-U.S. sources).

Time to degree. The time elapsed from the start of any graduate school program to completion of the doctoral degree.

Underrepresented minority. Groups that are underrepresented in science and engineering, relative to their numbers in the U.S. population: American Indian or Alaska Native, Black or African American, and Hispanic or Latino.⁶

NOTES

- 1 In the United States, educational attainment has risen over time (see <https://www.census.gov/data/tables/time-series/demo/educational-attainment/cps-historical-time-series.html>, accessed 17 July 2020).
- 2 For a detailed discussion on other aspects of education-related debt see National Center for Science and Engineering Statistics. 2019. *Doctorate Recipients from U.S. Universities 2018*, Education-Related Debt. NSF 19-301. Available at <https://nces.nsf.gov/pubs/nsf20301/report>.
- 3 For more data on the primary sources of financial support of doctorate recipients by field, please see related figure 16 in this report and detailed table 35 at <https://nces.nsf.gov/pubs/nsf21308/>.
- 4 Figure 29 presents the institutional yield ratio, which adjust the number of S&E doctorate recipients by the number of bachelor's degrees awarded in all fields by different types of institutions 8 years earlier, given that 8 years is the median time in S&E fields to the doctoral degree since the bachelor's degree. Time to the doctoral degree from the bachelor's degree varies within S&E fields; however, explorations of the data with 7- and 9-year lags produced similar results.
- 5 For data on the increase of Black or African American undergraduate students over time, see National Science Board, National Science Foundation. 2019. *Higher Education in Science and Engineering*, table S2-7. *Science and Engineering Indicators 2020*. NSB-2019-7. Alexandria, VA. Available at <https://nces.nsf.gov/pubs/nsb20197/>. Or National Center for Science and Engineering Statistics. 2019. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2019*, table 5-3. NSF 19-304. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf19304/>.
- 6 For detailed data on underrepresented minorities see National Center for Science and Engineering Statistics. 2019. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2019*, table 5-3. NSF 19-304. Alexandria, VA: National Science Foundation.

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