NATIONAL SCIENCE FOUNDATION
APRIL 2015

DOCTORATE RECIPIENTS FROM U.S. UNIVERSITIES 2013

NATIONAL CENTER FOR SCIENCE AND ENGINEERING STATISTICS
DIRECTORATE FOR SOCIAL, BEHAVIORAL AND ECONOMIC SCIENCES

SED
Survey of Earned Doctorates

About this report

THE SURVEY OF EARNED DOCTORATES, 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 six federal agencies: the National Aeronautics and Space Administration, National Endowment for the Humanities, National Institutes of Health, National Science Foundation (NSF), U.S. Department of Agriculture, and U.S. Department of Education. These data are reported in several publications from NSF's National Center for Science and Engineering Statistics. The most comprehensive and widely cited publication is this report, *Doctorate Recipients from U.S. Universities.*

This report calls attention to important trends in doctoral education, organized into themes highlighting important questions about doctorate recipients. Online, the reader is invited to explore trends in greater depth through detailed data tables and interactive graphics (www.nsf.gov/statistics/sed/). Technical notes and other online resources are provided to aid in interpretation of the data. The data tables are available as PDF and Excel files for easy viewing, printing, and downloading.

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National Science Foundation ■ **APRIL 2015** ■ NSF 15-304

Why is this important?

THE AMERICAN SYSTEM OF DOCTORAL EDUCATION is widely considered to be among the world's best, as evidenced by the large and growing number of international students each year, many of them among the top students in their countries, who choose to pursue the doctoral degree at U.S. universities. But the continued preeminence of U.S. doctoral education is not assured. Other nations, recognizing the contributions doctorate recipients make to economies and cultures, are investing heavily in doctoral education. Unless doctoral education in the United States continues to improve, the world's brightest students, including U.S. citizens, may go elsewhere for the doctoral degree, and they may begin careers elsewhere as well.

Annual counts of doctorate recipients 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. The changing characteristics of this population over time—including the 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; and reduced academic employment opportunities after graduation—reflect political, economic, social, technological, and demographic trends and events. Understanding the connections between these larger forces and the number and characteristics of doctorate recipients is necessary to make informed improvements in this country's doctoral education system.

Doctorate recipients begin careers in large and small organizations, teach in universities, and start new businesses. 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 innovative products, services, and works of art. In doing so, they contribute to a nation's economic growth, cultural development, and rising standard of living.

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Who earns a U.S. doctorate?

Each new cohort of doctorate recipients augments the supply of prospective scientists, engineers, researchers, and scholars. Data on the changing demographic composition of these cohorts reveal underutilized groups.

Overall trends

The 52,760 research doctorate degrees awarded by U.S. institutions in 2013 represent the highest number ever reported by the Survey of Earned Doctorates (SED). The number of doctorates awarded each year shows a strong upward trend over time—average annual growth of 3.4%—punctuated by periods of slow growth and even decline. The single-year growth in the number of research doctorates awarded in 2013 (3.5%) has been exceeded only three times in the past 20 years.

In every year of the SED, the number of doctorates awarded in science and engineering (S&E) fields has exceeded the number of non-S&E doctorates. The gap between the annual counts of S&E and non-S&E doctorates has widened over the past 40 years, with the proportion of S&E doctorates climbing from 59% in 1973 to 74% in 2013. The growth in the number of non-S&E doctorates awarded in 2013 (4.4%) was the largest single-year increase since 1992 (figure A).

Citizenship

The number of doctorates in S&E fields awarded to temporary visa holders grew to 13,436 in 2013, a 55% increase since 2003 and a nearly 6% increase since 2012. The number of S&E doctorates awarded to U.S. citizens and permanent residents also grew in 2013, but at a slower rate—a 39% increase since 2003 and less than 3% growth since 2012.

In 1993, 32% of all S&E doctorates were awarded to temporary visa holders. The proportion of S&E doctorate recipients holding temporary visas increased to 41% by 2007 but has since fallen to below 37% in 2013.

Over the period 2003 to 2013, 85% of the doctorates earned by temporary visa holders were in S&E fields, compared with 64% of the doctorates earned by U.S. citizens and permanent residents (figure B).

Countries or economies of foreign citizenship

Ten countries accounted for 70% of the doctorates awarded to temporary visa holders from 2003 to 2013, and the top three—China, India, and South Korea—accounted for more than half (figure C).

Sex

Citizenship

Women are becoming increasingly prevalent in each new cohort of doctorate recipients, earning a majority of all doctorates awarded to U.S. citizens and permanent residents each year since 2002 and earning one-third of all doctorates awarded to temporary visa holders over that period. Overall, women earned 46% of all doctorates in 2013. The total number of doctorate recipients increased for both men and women every year from 2002 until 2009. After a decline in 2010, the number of male and female doctorate recipients increased in each of the next 3 years among both temporary visa holders and U.S. citizens and permanent residents (figure D).

Field of study

Most of the growth in the number of doctorates earned by women has been in S&E fields. Women earned 42% of S&E doctorates awarded in 2013, up from 32% in 1993. Doctorates in S&E fields account entirely for the increase in doctorates earned by men overall, as the number of men earning doctorates in non-S&E fields fell over that 20-year period. The numbers of male doctorate recipients and female doctorate recipients in both S&E and non-S&E fields grew by more than 3% in 2013 (figure E).

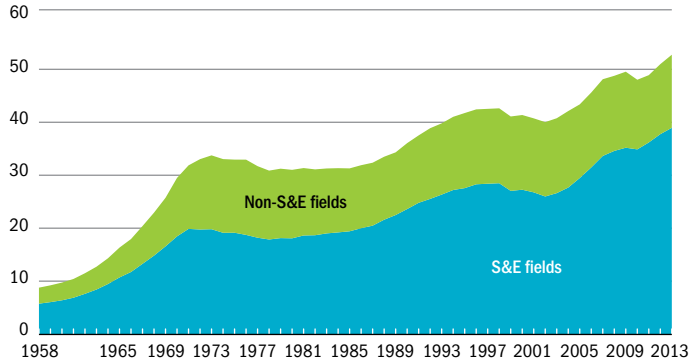
Race and ethnicity

Participation in doctoral education by underrepresented minority groups who are U.S. citizens or permanent residents is increasing, as evidenced by a 70% increase in the number of doctorates awarded to blacks or African Americans over the past 20 years and a more than doubling of Hispanic or Latino doctorate recipients. Owing to these growth rates, the proportion of doctorates awarded to blacks or African Americans has risen from 4.5% in 1993 to 6.4% in 2013, and the proportion awarded to Hispanics or Latinos has risen from 3.4% in 1993 to 6.3% in 2013. The number of American Indian or Alaska Native doctorate recipients increased in 2013 yet remains near its lowest point of the past 20 years (figure F).

A

Doctorates awarded by U.S. colleges and universities: 1958–2013

Doctorate recipients (thousands)

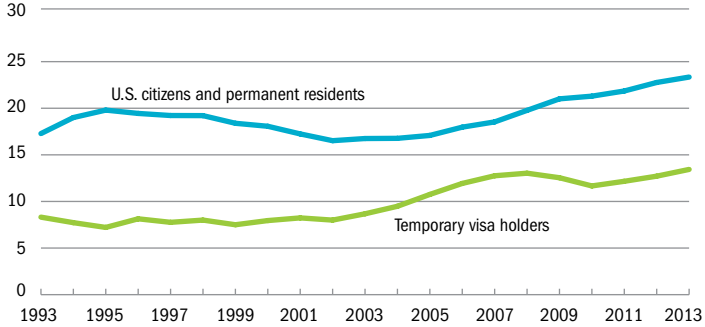


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 1.

B

Doctorates awarded in science and engineering fields, by citizenship: 1993–2013

S&E doctorate recipients (thousands)

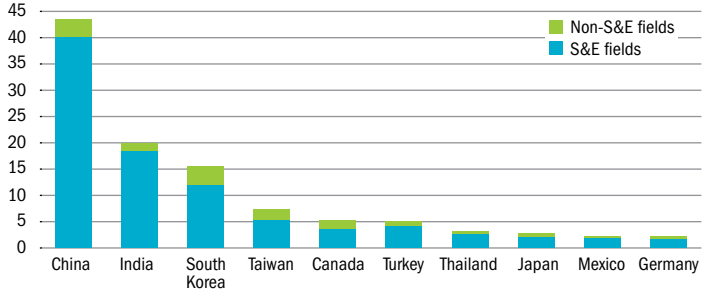


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 17, 18.

C

Top 10 countries or economies of foreign citizenship for U.S. doctorate recipients: Total, 2003–13

Doctorate recipients (thousands)



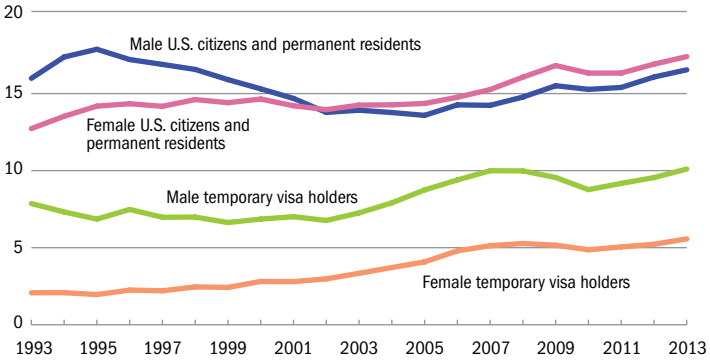
NOTES: China includes Hong Kong. Ranking is based on total number of doctorate recipients.

SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 25, 26.

D

Sex and citizenship of U.S. doctorate recipients: 1993–2013

Doctorate recipients (thousands)

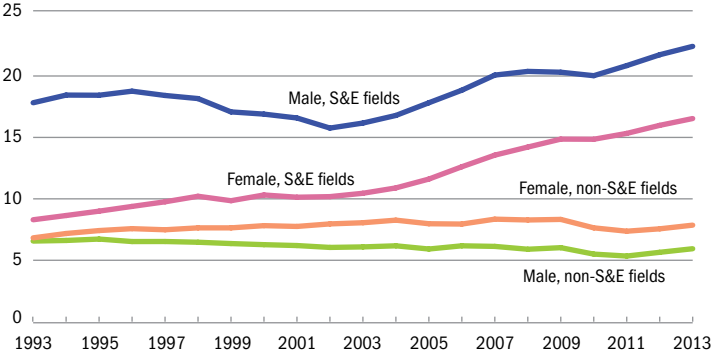


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 20, 21.

E

Sex and field of study of U.S. doctorate recipients: 1993–2013

Doctorate recipients (thousands)

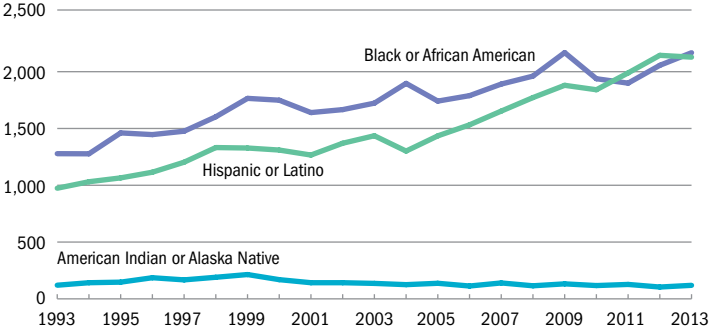


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 14, 15, 16.

F

Doctorates earned by members of U.S. underrepresented minorities: 1993–2013

Doctorate recipients



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 19, 22, 23, 24.

Which fields attract students?

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 trends

Science and engineering

Doctorates in science and engineering (S&E) fields, particularly in life sciences, represent a growing share of all doctorates awarded. Overall, S&E doctorates accounted for 74% of all doctorates awarded in 2013, a substantially larger share than 10 years earlier (65%). The relative share of doctorates awarded in social sciences has declined over the past decade, the only broad S&E field to do so, even though the number of social sciences doctorates was 29% larger in 2013 than it was in 2003 (figure A).

Non-science and engineering

The number of doctorates awarded in education has declined over the past decade, leading to a large, steady drop in the relative share of doctorates in that field from 16% in 2003 to 9% in 2013. Despite an increase in the number of humanities doctorates, the relative share of doctorates awarded in this field fell 2 percentage points from 2003 to 2013. The share of doctorates in other non-S&E fields has remained fairly stable over the past decade (figure B).

Temporary visa holders

In every broad field of study except life sciences, the share of doctorates awarded to temporary visa holders is larger in 2013 than it was 20 years earlier. Temporary visa holders are most prevalent in engineering and physical sciences. In 2013, temporary visa holders represented 56% of doctorate recipients in engineering and 45% of those in the physical sciences (figure C).

Minority U.S. citizens and permanent residents

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 2013, Asians were the largest U.S. minority population in life sciences, physical sciences, and engineering; blacks or African Americans were the largest U.S. minority population in education; and Hispanics or Latinos earned more doctorates in humanities than did any other minority group. Asians and blacks or African Americans earned the largest numbers of doctorates in other non-S&E fields in 2013, and Hispanics or Latinos and blacks or African Americans earned the largest numbers of doctorates in social sciences (figure D).

Women

Field of study

Women's share of doctorates awarded has grown over the past two decades in all broad fields of study. In 2013, women earned the majority of doctorates awarded in life sciences, social sciences, education, and humanities, and they earned nearly half of the doctorates in other non-S&E fields.

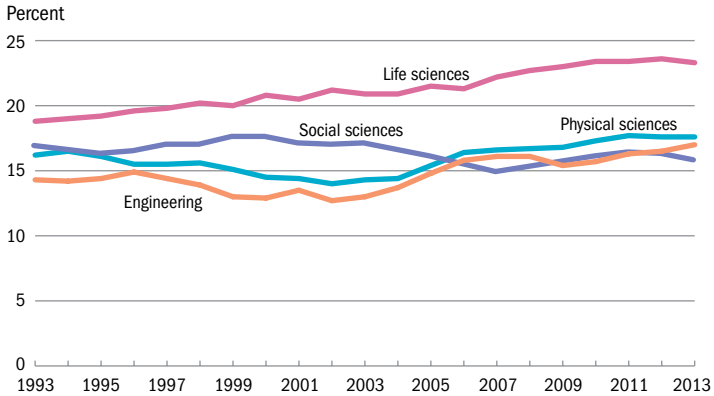
Although women earn less than 30% of the doctorates awarded in both physical sciences and engineering, their numbers are increasing rapidly in those fields. From 2003 to 2013, the number of women earning doctorates in physical sciences and engineering increased 75% and 125%, respectively, exceeding the rate of increase in all other broad fields of study (figure E).

Growing fields

The fastest growing subfields of doctoral study for women over the past decade have been within the physical sciences (led by mathematics) and engineering (figure F).

A

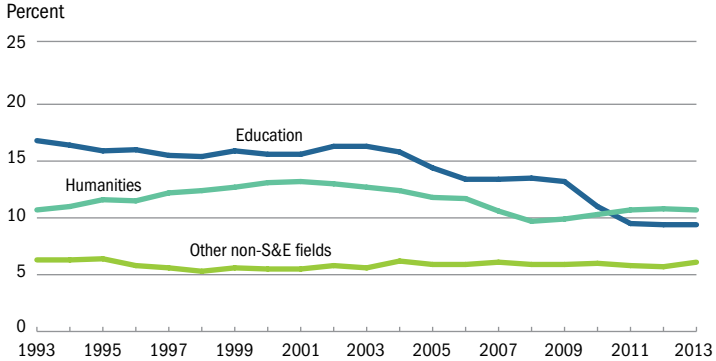
Doctorates awarded in science and engineering fields of study: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 4, 7, 12, 13.

B

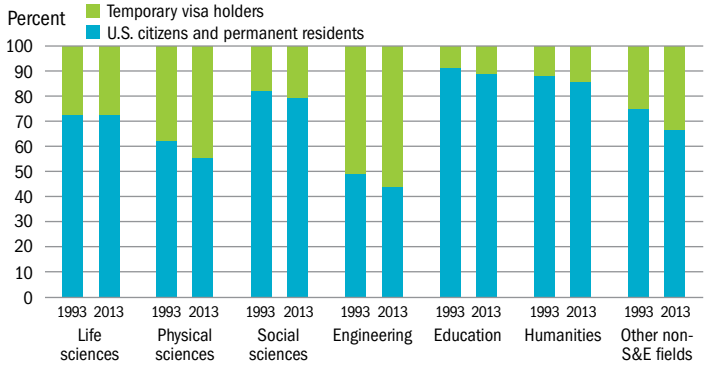
Doctorates awarded in non-science and engineering fields of study: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 4, 8, 12, 13.

C

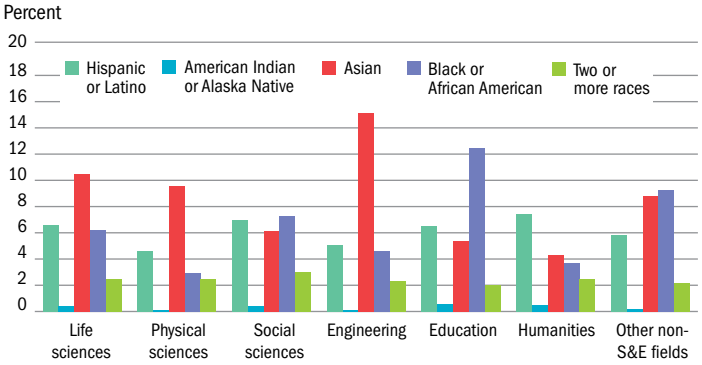
Doctorates awarded, by citizenship and field of study: 1993 and 2013



NOTE: Percentages are based on the number of doctorate recipients for whom citizenship was reported.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 17.

D

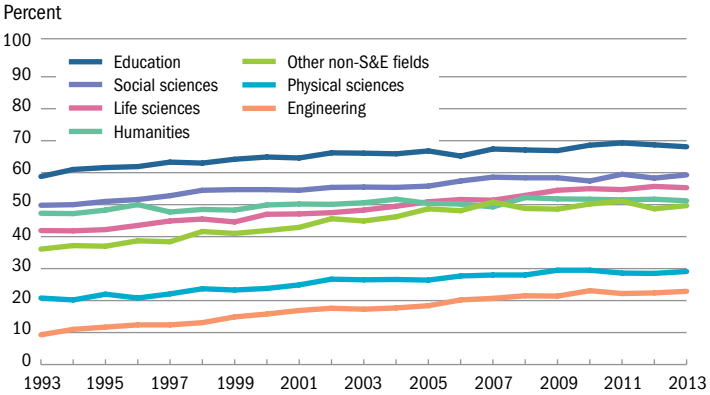
Doctorates awarded to minority U.S. citizens and permanent residents, by race, ethnicity, and field of study: 2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 23, 24.

E

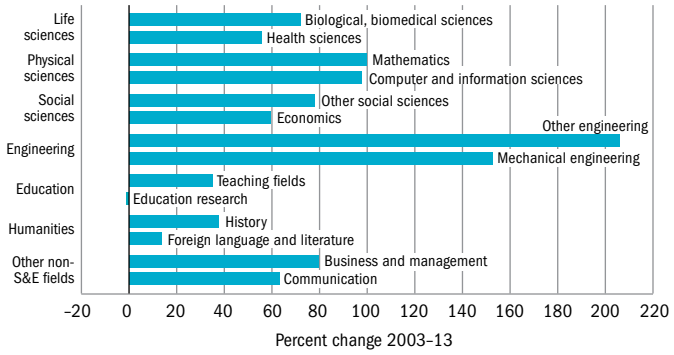
Doctorates awarded to women, by field of study: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 14, 15, 16.

F

Top fields of study for female doctorate recipients, by field of study: 2003–13



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 15.

What influences the 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. The share of doctorate recipients from families in which neither parent has earned more than a high school degree is declining, and the proportion of families in which at least one parent has earned a bachelor's degree or higher continues to climb, rising from just over half of doctorate recipients in 1993 to more than two-thirds in 2013 (figure A).

By race and ethnicity

The pattern of rising parental educational attainment is visible among all races and ethnicities for U.S. citizen or permanent resident doctorate recipients. Nonetheless, doctorate recipients from underrepresented minority groups are less likely to have at least one parent with a bachelor's degree than are Asian or white doctorate recipients (figure B).

As of 2013, approximately half of American Indian or Alaska Native, black or African American, and Hispanic or Latino doctorate recipients belonged to families in which neither parent had been awarded a college degree. In comparison, roughly three-fourths of Asian doctorate recipients and white doctorate recipients came from families with at least one college-educated parent, and half had at least one parent who had earned an advanced degree (figure B).

Sources of financial support

Overview

Research assistantships and teaching assistantships are the most important sources of financial support for a growing proportion of doctoral students. Compared with years past, fewer doctoral students now rely primarily on their own resources—loans, personal savings, personal earnings, and the earnings or savings of their spouse, partner, or family—to finance their doctoral studies. The proportion of doctoral students relying on fellowships or grants as their most important source of financial support has remained relatively stable since 2004 (figure C).

By field of study

In 2013, fellowships or grants were the most common primary source of support for doctoral students in life sciences. Research assistantships were the dominant source in physical sciences and in engineering, and teaching assistantships were the most common source for doctoral students in humanities. In other non-science and engineering (non-S&E) fields and in social sciences, similar proportions of doctorate recipients reported fellowships or grants, teaching assistantships, and their own resources as their primary source of financial support. Doctoral students in education fields were the most likely to rely on their own resources, with nearly half reporting this as their primary source of support (figure D).

Education-related debt

The amount of education-related debt incurred by doctorate recipients during graduate school is an indicator of the availability of financial support. In 2013, more than two-thirds of doctorate recipients in life sciences and more than three-quarters of those in physical sciences and engineering reported no debt related to their graduate education when they were awarded the doctorate. In social sciences, humanities, education, and other non-S&E fields, that proportion dropped to approximately one-half.

Within each broad field of study, roughly 8% to 11% of doctorate recipients had incurred low levels ($10,000 or less) of education-related debt by the time they graduated. The shares of doctoral graduates with education-related debt burdens over $30,000 were greatest in the social sciences, education, humanities, and other non-S&E fields (figure E).

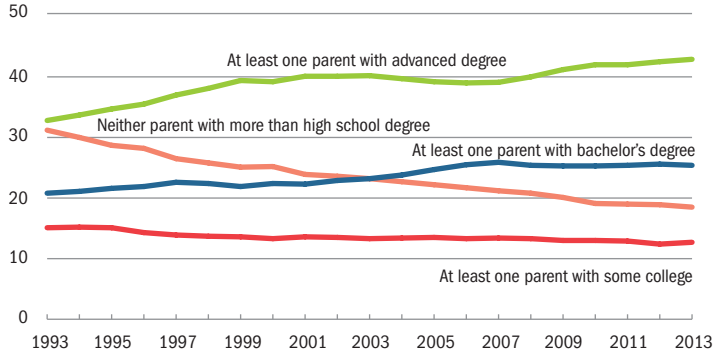
Time to degree

The time between entering graduate school and earning the doctorate has fallen in all fields of study over the past 20 years, particularly in education. Since 2006, there has been little change in the duration of study of doctorate recipients in S&E fields, and there have been continued declines in the duration of study of non-S&E doctorates. Despite these trends, it still takes years longer to earn a doctorate in non-S&E fields than it does to complete doctoral training in S&E fields (figure F).

A

Highest parental educational attainment: 1993–2013

Percent doctorate recipients

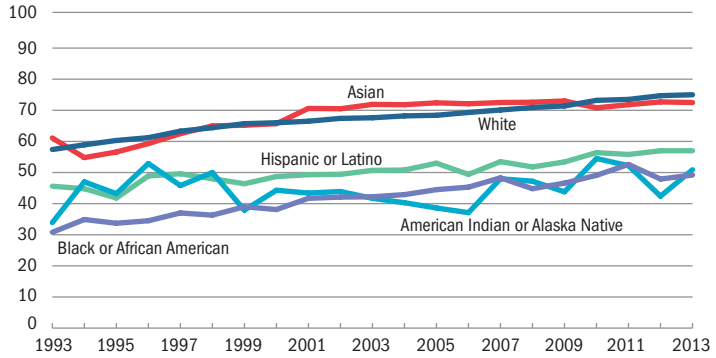


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 33, 34.

B

Parental educational attainment, by race and ethnicity: 1993–2013

Percent having at least one parent with a bachelor's degree or higher

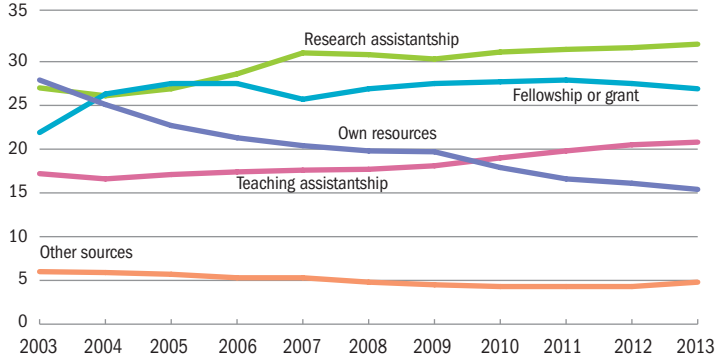


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 33, 34.

C

Primary source of financial support: 2003–13

Percent

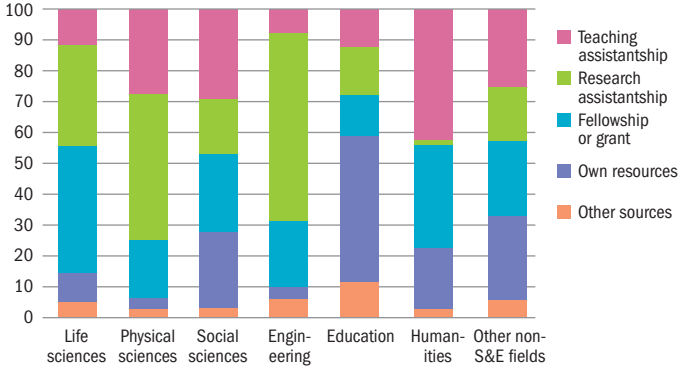


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 35.

D

Primary source of financial support, by field of study: 2013

Percent

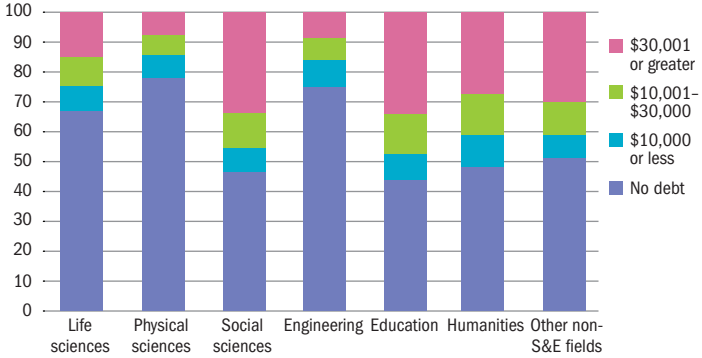


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 35, 36, 37.

E

Graduate education-related debt, by field of study: 2013

Percent

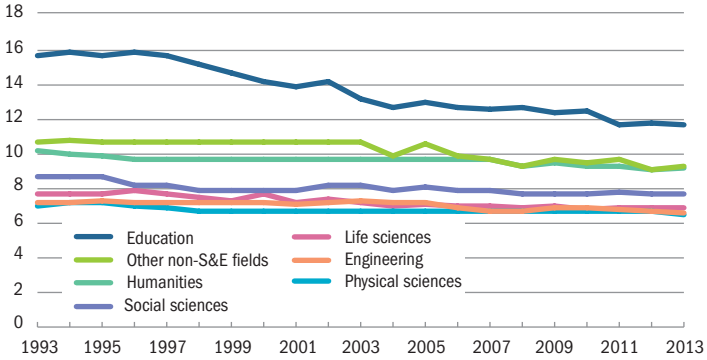


SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 38, 39, 40.

F

Median time to degree, by field of study: 1993–2013

Years (graduate school entry to doctorate)



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 31, 32.

What are the postgraduation trends?

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

Job market

Science and engineering

At any given time, the job market will be better for new doctorate recipients in some fields of study than in others, although all fields tend to follow a similar cyclical pattern that generally reflects overall economic trends.

In every broad science and engineering (S&E) field, the proportion of 2013 doctorate recipients who reported definite commitments for employment or postdoctoral (postdoc) study was at or near the lowest level of the past 15 years (figure A).

Non-science and engineering

The proportion of doctorate recipients with definite commitments for employment or postdoc study declined in 2013 for the fourth time in the past 5 years in every broad non-S&E field of study. The share of doctorate recipients with definite commitments reached 20-year low points in each of these non-S&E fields (figure B).

First postgraduate position

Academic employment

In 2013, half of all doctorate recipients with definite commitments for employment in the United States (excluding those with commitments for postdoc positions) reported that their principal job would be in academe. The rate at which doctorate recipients take academic positions upon graduation varies by field of study.

The highest rates of academic employment are reported by doctorate recipients in humanities and other non-S&E fields; the lowest rates are reported by engineering and physical sciences doctorates. Over the past 10 years, the rate of academic employment has declined in life sciences, physical sciences, and engineering, whereas the academic employment rate of doctorates in education and other non-S&E fields has increased (figure C).

Postdoc positions

Historically, postdoc positions have been a customary part of the early career paths of doctoral scientists in the life sciences and physical sciences; such positions are becoming increasingly prevalent in engineering and social sciences fields as well. However, the proportion of doctorate recipients taking postdoc positions declined in 2013 in life sciences, physical sciences, and social sciences fields, and the proportion increased only slightly in engineering and non-S&E fields. Still, nearly two-thirds of 2013 doctoral graduates in life sciences took postdoc positions immediately after graduation, and nearly half of all S&E doctorate recipients did so. The proportion of social sciences doctorate recipients accepting postdoc positions has increased the most sharply over the past decade, climbing from 28% in 2003 to 36% in 2013 (figure D).

Median salaries

In 2013, doctorate recipients who had definite commitments for a postdoc or other employed position in the United States in the coming year reported annual salaries that varied according to their field of study and the type of position to which they committed.

In 2013, doctorate recipients who took postdoc positions reported similar salaries regardless of their field of study. In all broad fields, postdoc salaries were lower than salaries reported by doctorate recipients entering non-postdoc employment in industry or academe. Academic salaries lagged behind industry salaries in all broad fields except humanities. Doctorate recipients in other non-S&E fields and in engineering earned the highest median academic salaries, and doctorate recipients in other non-S&E fields and in physical sciences earned the highest median salaries in industry positions (figure E).

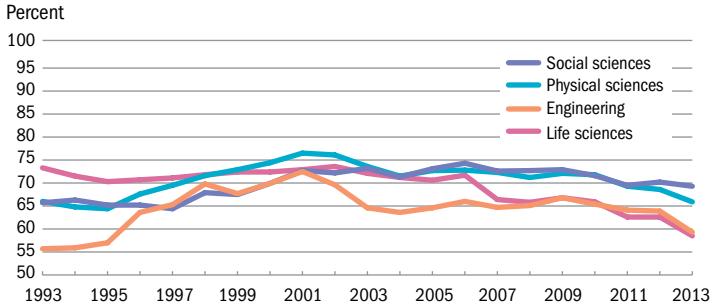
Postgraduation location

Over the past 20 years, temporary visa holders earning doctorates have been increasingly likely to stay in the United States immediately following graduation (stay rate). In 1993, more than half of doctorate recipients holding temporary visas reported definite postgraduation commitments for a postdoc or other employment in the United States; by 2013, the stay rate had risen to nearly three-fourths.

Stay rates are highest in fields where temporary visa holders are most prevalent: engineering, physical sciences, and life sciences. Over the past 20 years, the pattern of stay rates for non-S&E doctorate recipients and social sciences doctorate recipients has been similar, and the level of stay rates for both fields remains approximately 20 percentage points below the stay rates of graduates in engineering, physical sciences, and life sciences (figure F).

A

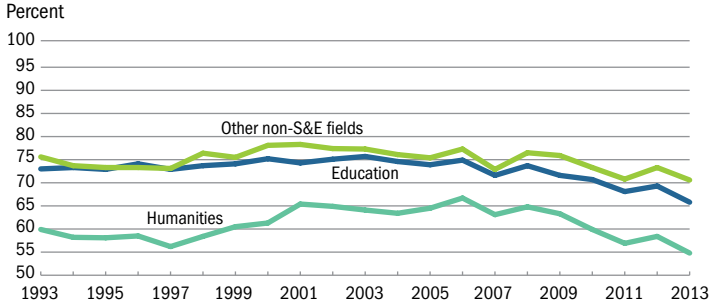
Definite commitments at doctorate award, by science and engineering fields of study: 1993–2013



NOTE: 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 or a postdoc position in the coming year.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 42, 43.

B

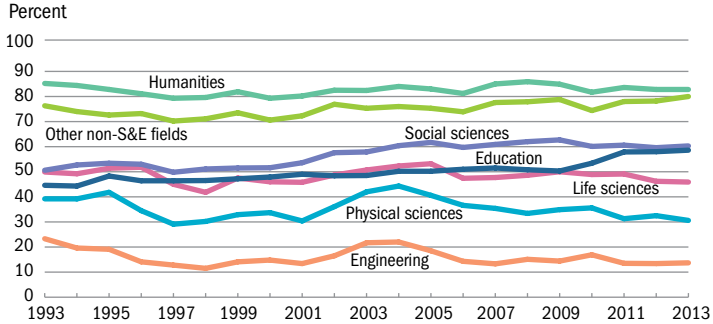
Definite commitments at doctorate award, by non-science and engineering fields of study: 1993–2013



NOTE: 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 or a postdoc position in the coming year.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 42, 43.

C

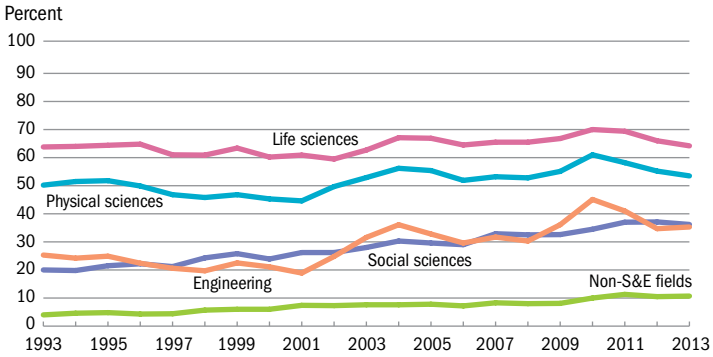
Definite commitments for academic employment in the United States, by field of doctoral study: 1993–2013



NOTE: Percentages are based on those with both definite commitments for employment in the coming year (including those missing employer type) and plans to stay in the United States.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 44, 51, 52.

D

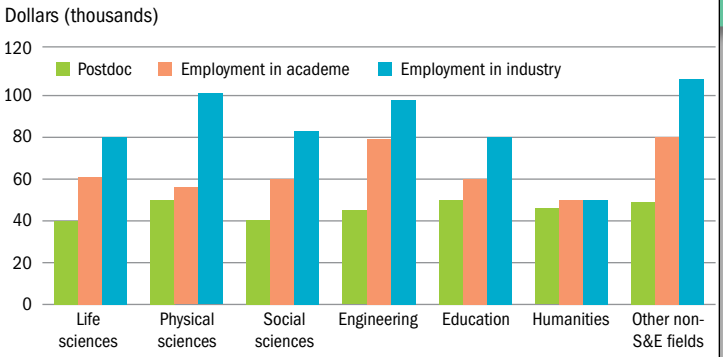
Postdoc rate, by field of study: 1993–2013



NOTE: Percentages are based on the number of doctorate recipients who reported definite postgraduation commitments for a postdoc position or other employment.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 44, 51, 52.

E

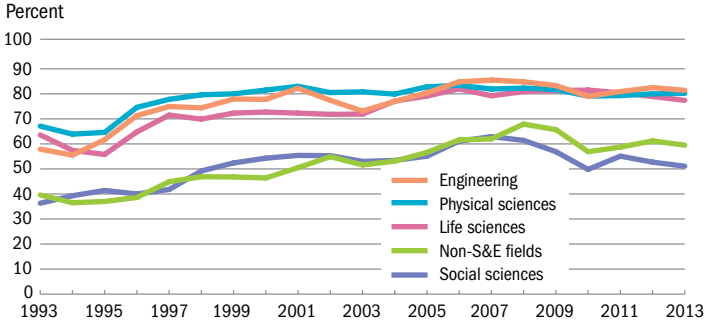
Median basic salary of doctorate recipients with definite commitments in the United States, by position type and field of study: 2013



NOTE: Other non-S&E fields includes business management and administration.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 48, 49.

F

Stay rate of temporary visa holders with definite commitments in the United States, by field of study: 1993–2013



NOTE: Percentages are based on temporary visa holders who reported definite postgraduation commitments for a postdoc position or other employment.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 51, 52, 53.

Doctoral institutions: What draws students to an institution?

Doctoral institutions differ with respect to the mix of degree programs they offer and the students they attract. Understanding how these factors vary across different types of institutions can better inform the enrollment decisions of future doctoral students.

Overall counts and trends

The relative share of research doctorates awarded by very high research institutions declined steadily from 89% in 1958 to 76% in 1980. Over the same period, the relative share awarded by high research universities increased by 7 percentage points and that of doctoral research universities increased by 2 percentage points. These trends have continued, at a slower pace, for all three types of institutions since 1980, with the share of doctorates awarded by very high research universities declining to 73% in 2013, and the shares awarded by high research universities and doctoral research universities increasing slightly (figure A).

Fields of study

The prominence of particular doctoral fields of study varies across the types of institution. In 2013, more than 60% of the doctorates awarded by very high research universities were in life sciences, physical sciences, and engineering fields, whereas one-half of the doctorates awarded by high research universities and one-third of the doctorates awarded by doctoral research universities were in these fields. The relative share of humanities doctorates was also greater in very high research universities than in high research and doctoral research universities. In contrast, doctorates in social sciences and education fields accounted for almost half of the 2013 doctorates awarded by doctoral research universities, and more than one-third of those awarded by high research universities, but less than one-quarter were awarded by very high research universities (figure B).

Characteristics of doctorate recipients

Sex

In 2013, women earned more than one-half of the doctorates awarded by doctoral research universities and nearly one-half of the doctorates awarded by high and very high research universities. In the very high research universities, the share of doctorates awarded to women increased steadily from 1993 to 2009 and has remained level since then. The upward trend in the proportion of female doctorate recipients ended in the early 2000s in the high and doctoral research universities (figure C).

Citizenship

A total of 15,678 temporary visa holders earned science and engineering (S&E) and non-S&E doctorates in 2013. In most years from 1993 to 2013, the percentage of doctorates awarded to temporary visa holders by both very high and high research universities was more than double the percentage awarded by doctoral research universities. The share of doctorates awarded to temporary visa holders by all three types of institutions increased over the past 20 years (figure D).

Race and ethnicity

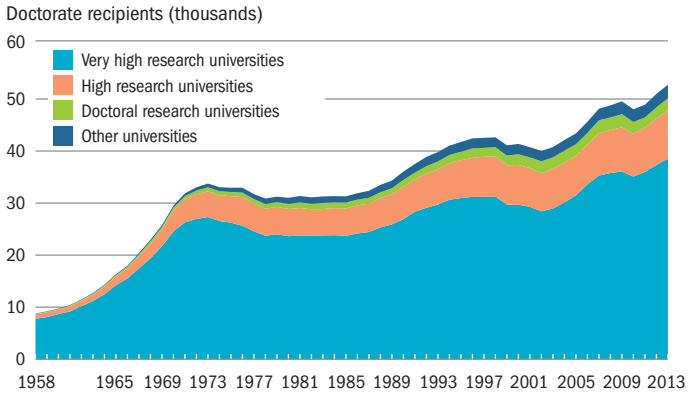
In 2013, a total of 4,414 doctorate recipients who were U.S. citizens or permanent residents reported being members of underrepresented minority groups. Underrepresented minority doctorate recipients are most prevalent from doctoral research universities (20% of total doctorates in 2013) and least prevalent from very high research universities (8% of total doctorates). The share of doctorates awarded to underrepresented minorities has grown over the past 20 years in all types of institutions (figure E).

Baccalaureate-origin institution type

The graduating doctoral cohorts of the three doctoral institution types differ with respect to where the bachelor's degree was earned. Over the 5-year period 2009 to 2013, more than one-third of doctorate recipients from very high research universities had previously earned their bachelor's degree from a very high research university, and another one-third earned their bachelor's degree from a foreign institution. A similar share of doctorate recipients from high research universities (33%) had previously earned their bachelor's degree from foreign universities, but a larger share of these doctoral graduates earned their bachelor's degree from other doctorate-granting universities (defined as high research and doctoral research universities) and from master's-granting universities. Among doctorate recipients from doctoral research universities, almost half had earned bachelor's degrees from master's-granting and other doctorate-granting universities and only 18% had earned a bachelor's degree from a foreign university (figure F).

A

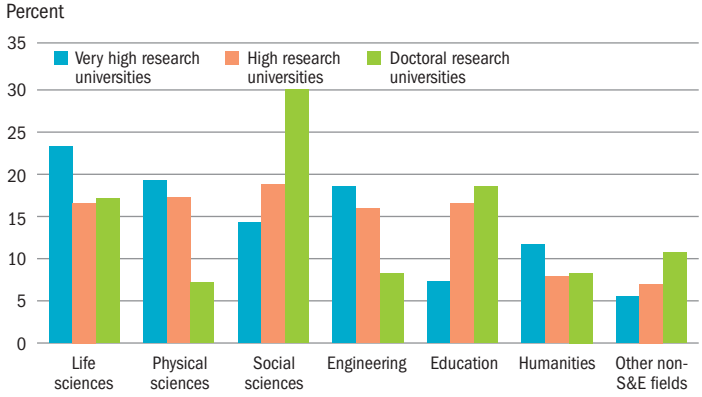
Doctorates awarded, by type of doctoral institution: 1958–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 11.

B

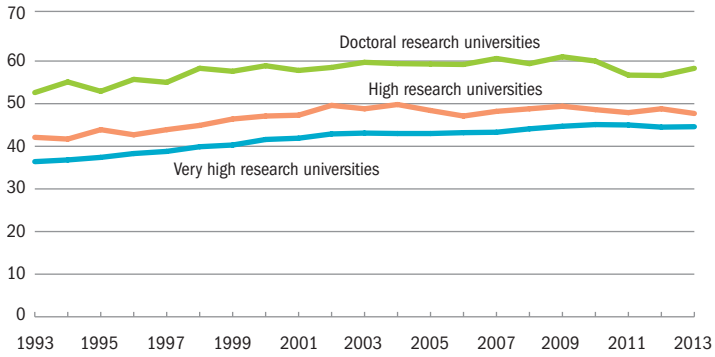
Doctorates awarded, by type of doctoral institution and field of study: 2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 11.

C

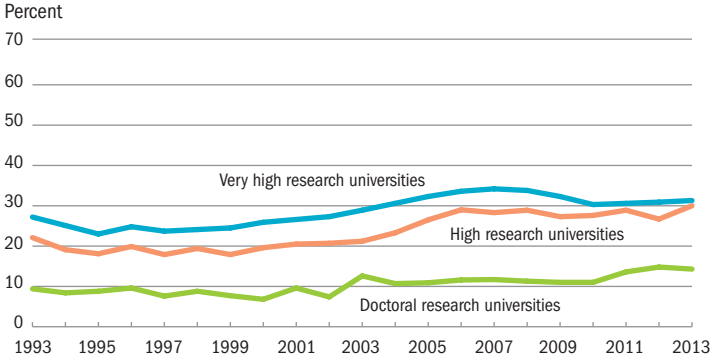
Female doctorate recipients, by type of doctoral institution: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 14,15.

D

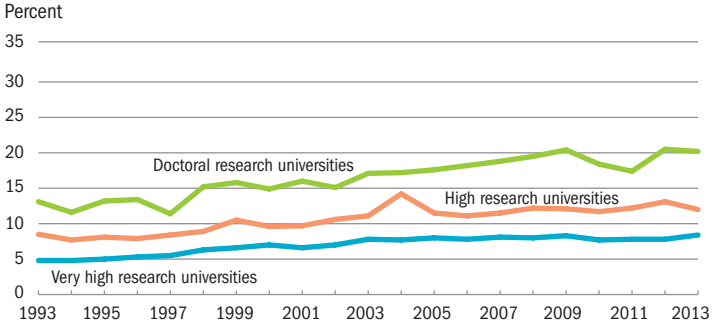
Doctorate recipients holding temporary visas, by type of doctoral institution: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 10, 25, 26.

E

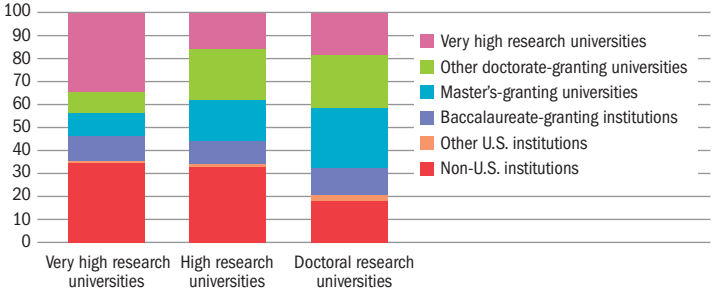
Doctorate recipients from underrepresented minority groups, by type of doctoral institution: 1993–2013



NOTE: Underrepresented minorities include blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 9, 19.

F

Baccalaureate-origin institution type, by type of doctoral institution: 2009–13



NOTE: Other doctorate-granting universities includes high research universities and doctoral research universities.
SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: table 11.

Doctoral institutions: How do expenses and employment outcomes differ?

Doctoral institutions also differ with respect to the duration and expense of the doctoral experience and the initial postgraduate employment outcomes of doctorate recipients. Knowledge of possible employment outcomes can influence enrollment decisions.

Time to degree

Over the 5-year period 2009 to 2013, doctorate recipients from doctoral research universities took longer than those from very high and high research universities to complete their degree, and this result holds in every broad field of study. Similarly, doctorate recipients from high research universities took longer than those from very high research universities to complete the degree in every broad field except social sciences. The difference in median time to degree of doctorate recipients from doctoral research universities versus very high research universities ranged between 1.1 years in engineering and 5.1 years in other non-science and engineering fields.

Physical sciences and engineering had the shortest median times to degree across the three types of institutions, and education had the longest times to degree (figure A).

Education-related debt

Graduates with debt

In 2001, roughly one-half of doctorate recipients from all three types of doctoral institutions graduated with outstanding debt that had been incurred during their undergraduate or graduate education. Over the subsequent 12 years the percentage of cumulative education-related debt declined to 46% for graduates of very high research universities, increased to 53% for graduates of high research universities, and increased to 66% for graduates of doctoral research universities (figure B).

Level of debt

In 2013, the percentage of doctorate recipients with a high level (exceeding $30,000) of education-related debt incurred specifically during graduate education was markedly greater in doctoral research universities (45%) than in high research universities or very high research universities. The proportion of doctorate recipients incurring graduate education-related debt of $30,000 or less (but greater than $0) was similar across the types of institutions, ranging from 15% at doctoral research universities to 20% at high research universities (figure C).

First postgraduate position

Return to predoctoral employment

Among doctorate recipients with definite commitments for employment (other than postdocs) in the United States, some indicated commitments to return to or continue with employment in a job they held before the award of their doctoral degree. Doctorate recipients from doctoral research universities are more likely to return to predoctoral employment than are doctoral graduates from high research universities, who themselves are more likely than graduates from very high research universities to return to their predoctoral employment. The percentage returning to or continuing in predoctoral employment declined from 1993 to 2013, and the decline was greater for doctoral graduates from very high and high research universities (figure D).

Employment sector

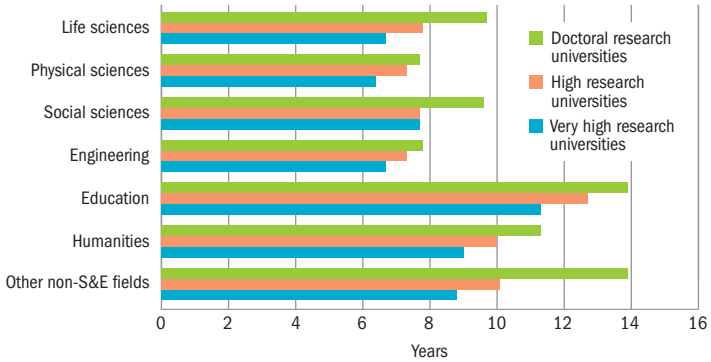
In 2013, academe was the most common employment sector for doctorate recipients reporting definite commitments for employment in the United States, with approximately half of doctoral graduates from all three institution types committing to academic positions following graduation. A larger share of doctorate recipients from very high research universities (34%) took positions in industry or business than did those from high research universities (22%) or doctoral research universities (18%) (figure E).

Median salaries

Median salaries were similar for doctorate recipients from the three types of institutions among those with definite commitments in 2013 for U.S. employment as postdocs ($40,000 to $43,000) or in academe ($57,000 to $60,000). The highest median salaries for commitments to employment in business or industry were reported by doctorate recipients from very high research universities ($100,000). Median salaries for those with definite commitments for employment in government were highest for doctorate recipients from doctoral research universities ($89,500) (figure F).

A

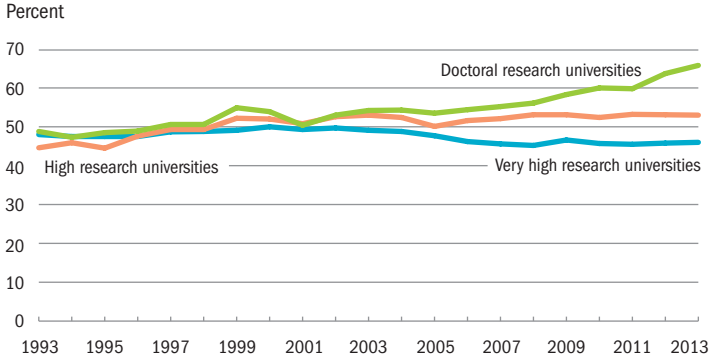
Median time to degree, by type of doctoral institution and broad field of study: 2009–13



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 31, 32.

B

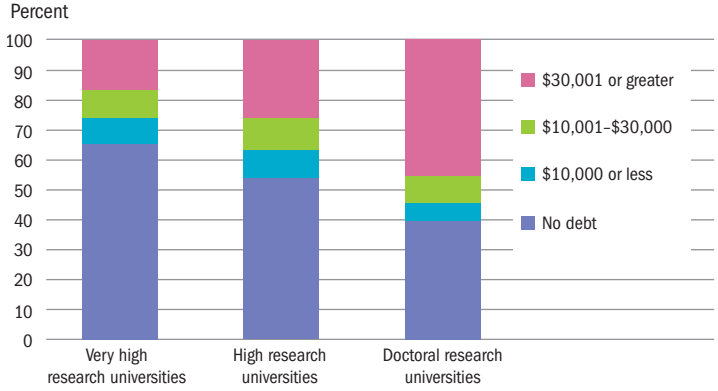
Doctorate recipients with cumulative education-related debt, by type of doctoral institution: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 38, 40.

C

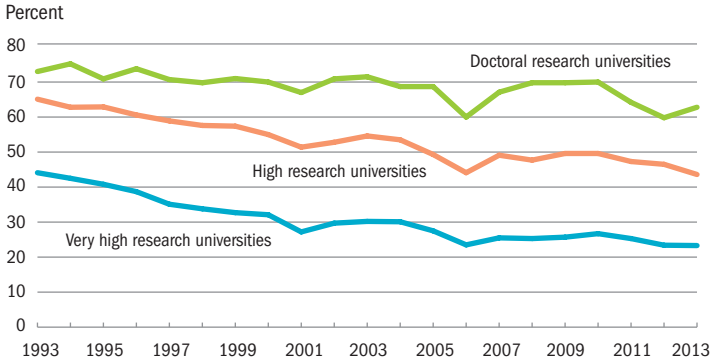
Level of graduate education-related debt, by type of doctoral institution: 2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 38, 39, 40, 41.

D

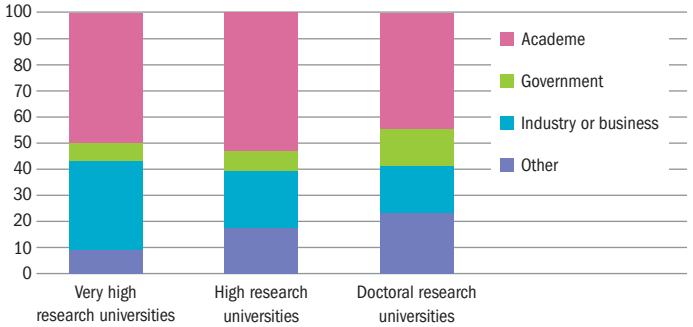
Doctorate recipients returning to or continuing in predoctoral employment in the United States, by type of doctoral institution: 1993–2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 42, 43, 44, 45.

E

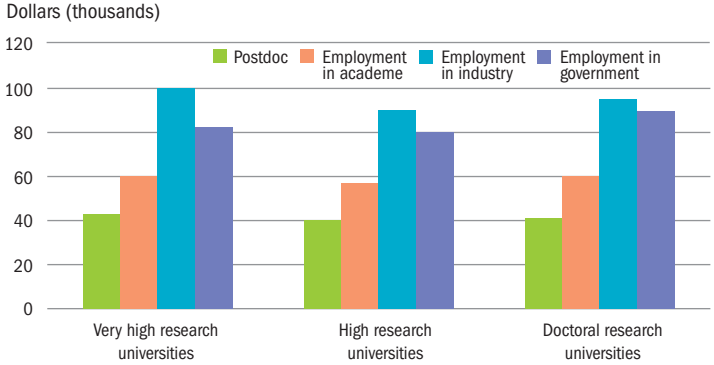
Employment sector of doctorate recipients with definite employment commitments in the United States, by type of doctoral institution: 2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 46, 47.

F

Median salary of doctorate recipients with definite commitments in the United States, by position type and type of doctoral institution: 2013



SOURCE: *Doctorate Recipients from U.S. Universities 2013*. Related detailed data: tables 48, 49.

Glossary

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.

Definite commitment. A doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment or a postdoc position in the coming year.

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

Field of study. The Survey of Earned Doctorates (SED) collects data on 317 fields of doctoral study. For reporting purposes, these fields are grouped into 35 major fields and are further aggregated into seven broad fields: life sciences, physical sciences, social sciences, engineering, education, humanities, and other non-science and engineering fields. See table A-6 in the technical appendix to 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 in 2013. (The technical appendix and the survey questionnaire are both available at www.nsf.gov/statistics/sed/.)

Graduate education-related debt. The amount of debt owed by a doctorate recipient at the time the doctorate is awarded that is directly related to graduate education.

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

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

Postdoc position. A temporary position primarily for gaining additional education and training in research for doctorate recipients.

Postdoc rate. The proportion of doctorate recipients who have definite commitments for a postdoc position among all doctorate recipients with definite commitments.

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 "two or more races." 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 and Other Pacific Islander. For 2000 and earlier data, Native Hawaiians and Other Pacific Islanders are counted in the Asian group. For the purposes of this report, the term "underrepresented minority" refers to the American Indian or Alaska Native, black or African American, and Hispanic or Latino groups.

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 doctorates, such as the MD, DDS, JD, and PsyD, are not covered by the SED.

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

Self-support rate. The proportion of doctorate recipients who report "own resources" as the primary source of financial support during their doctoral education.

Sources of financial support. Sources of financial support are grouped into the following five categories: fellowships (includes scholarships and 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 foreign [non-U.S.] support).

Stay rate. The proportion of doctorate recipients with temporary visas who have definite commitments for employment or a postdoc position in the coming year and who indicated the location of their commitment is in the United States.

Time to degree. The median values of the time elapsed from the start of any graduate school program to completion of the doctoral degree. In addition to this measure, a second measure of time to degree is also reported in the data tables: median values of the time elapsed from completion of the bachelor's degree to completion of the doctorate.

Data Source

THE SURVEY OF EARNED DOCTORATES (SED) is the sole data source for *Doctorate Recipients from U.S. Universities: 2013*. The principal elements of the 2013 SED data collection are described below. More detailed information and related technical tables are available in the technical appendix to this report, available online at www.nsf.gov/statistics/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 2013 SED recognized 18 distinct types of research doctorates. In 2013, 98% of research doctorate recipients earned the PhD.

Survey universe. The population eligible for the 2013 survey consisted of all individuals who received a research doctorate from a U.S. academic institution in the 12-month period from 1 July 2012 to 30 June 2013. The total universe consisted of 52,760 persons in 421 institutions that conferred research doctorates in academic year 2013.

Data collection. Survey instruments were mailed to institutional coordinators at each doctorate awarding institution. The institutional coordinators distributed the survey forms to individuals receiving a research doctorate, collected the forms, and returned them to the survey contractor for editing and processing. Data were also collected using Web and telephone versions of the survey. Respondents who did not complete critical survey items were contacted by mail to request response to these items. NORC at the University of Chicago currently conducts the SED under contract to the National Science Foundation.

Survey response rates. In 2013, 92% of research doctorate recipients completed the survey instrument. 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. Response rates for 2003–13 are provided in the technical appendix (www.nsf.gov/statistics/sed).

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 a decline in number of degrees awarded from 2009 to 2011 (in particular, see figures 1D and 1F in the "Who earns a U.S. doctorate?" section and figure 2B in the "Which fields attract students?" section). Readers should note that the declines from 2009 to 2010 and from 2010 to 2011 are at least partly attributable to the EdD reclassification.

Further Reading

FOR AN OVERARCHING VIEW of long-term trends in U.S. doctoral education, as reflected in the data from the Survey of Earned Doctorates (SED), please see *U.S. Doctorates in the 20th Century* (NSF 06-319, October 2006, http://www.nsf.gov/statistics/nsf06319/). Additional context is provided in summary reports for previous years (*Doctorate Recipients from U.S. Universities*), available at www.nsf.gov/statistics/doctorates/.

Other publications from the National Science Foundation use SED data to report on focused topics. Publications that relate to the topics covered in *Doctorate Recipients from U.S. Universities: 2013* are listed below, by relevant section.

Who earns a U.S. doctorate? and Which fields attract students?

Women, Minorities, and Persons with Disabilities in Science and Engineering: 2015 (NSF 15-311, February 2015, http://www.nsf.gov/statistics/2015/nsf15311/.

Numbers of Doctorates Awarded in the United States Declined in 2010 (NSF 12-303, November 2011, http://www.nsf.gov/statistics/infbrief/nsf12303/).

Numbers of Doctorates Awarded Continue to Grow in 2009; Indicators of Employment Outcomes Mixed (NSF 11-305, November 2010, http://www.nsf.gov/statistics/infbrief/nsf11305/).

Interdisciplinary Dissertation Research (NSF 10-316, March 2010, http://www.nsf.gov/statistics/infbrief/nsf10316/).

Numbers of U.S. Doctorates Awarded Rise for Sixth Year, but Growth Slower (NSF 10-308, November 2009, http://www.nsf.gov/statistics/infbrief/nsf10308/).

What influences the path to the doctorate?

Baccalaureate Origins of U.S.-trained S&E Doctorate Recipients (NSF 13-323, April 2013, http://www.nsf.gov/statistics/infbrief/nsf13323/).

Role of HBCUs as Baccalaureate-Origin Institutions of Black S&E Doctorate Recipients (NSF 08-319, August 2008, http://www.nsf.gov/statistics/infbrief/nsf08319/).

Baccalaureate Origins of S&E Doctorate Recipients (NSF 08-311, July 2008, http://www.nsf.gov/statistics/infbrief/nsf08311/).

Time to Degree of U.S. Research Doctorate Recipients (NSF 06-312, March 2006, http://www.nsf.gov/statistics/infbrief/nsf06312/).

What are the postgraduation trends?

Unemployment among Doctoral Scientists and Engineers Remained Below the National Average in 2013 (NSF 14-317, September 2014, https://www.nsf.gov/statistics/infbrief/nsf14317/).

Unemployment among Doctoral Scientists and Engineers Increased but Remained Below the National Average (NSF 14-310, April 2014, http://www.nsf.gov/statistics/infbrief/nsf14310/).

International Mobility and Employment Characteristics among Recent Recipients of U.S. Doctorates (NSF 13-300, October 2012, http://www.nsf.gov/statistics/infbrief/nsf13300/).

Emigration of U.S.-Born S&E Doctorate Recipients (NSF 04-327, June 2004, http://www.nsf.gov/statistics/infbrief/nsf04327/).

Plans for Postdoctoral Research Appointments among Recent U.S. Doctorate Recipients (NSF 04-308, March 2004, http://www.nsf.gov/statistics/infbrief/nsf04308/).

Interstate Migration Patterns of Recent Science and Engineering Doctorate Recipients (NSF 02-311, February 2002, http://www.nsf.gov/statistics/nsf02311/).

Online Resources

AN INTERACTIVE VERSION of the printed report and its related resources, described below, are available on the Web at www.nsf.gov/statistics/sed/.

Data tables. Data on the full range of survey items collected by the 2013 Survey of Earned Doctorates (SED) are presented in 70 detailed statistical tables. Figures in this report reference these related detailed data by table number. The full set of tables is available for download, either as PDF or Excel files.

Figures. The figures illustrating each theme are available in a variety of downloadable formats, together with the figure's source data. All formats are available from the "Download" tab associated with each figure.

Supporting data. Data supporting each figure in the report is available for download in Excel format.

Survey questionnaire. The questionnaire for the 2013 SED is available from a link in the "How Do I…" section of the online report.

Technical appendix. The technical notes provide more detail on how the SED collects data on recipients of research doctorates. The appendix includes technical tables that provide such information as the types of research doctoral degrees included in the SED, survey response rates over time, and details on field aggregations.

Acknowledgments

THE CONDUCT OF THE Survey of Earned Doctorates (SED), the maintenance of the SED, and resulting publications are supported by the National Science Foundation (NSF), National Institutes of Health (NIH), U.S. Department of Education (USED), National Endowment for the Humanities (NEH), U.S. Department of Agriculture (USDA), and National Aeronautics and Space Administration (NASA). These federal agencies gratefully acknowledge the support and assistance of graduate deans and their staff, registrars, dissertation officers, and other administrators who participate in the SED effort and contribute to its success. Heartfelt thanks are also extended to the new research doctorate recipients who completed the 2013 survey.

Representatives from the six sponsoring agencies have provided sound advice on issues related to survey design and data presentation: Jennifer Sutton (NIH), Ted Socha (USED), Frank Shaw (NEH), Joanne Brosh (USDA), and Mark Fiegener, SED Project Officer (NSF), who oversaw the preparation of this report. Emilda Rivers, John Gawalt, and Jeri Mulrow, at NSF's National Center for Science and Engineering Statistics (NCSES) reviewed and commented upon multiple drafts of the report and data tables. Staff at NORC at the University of Chicago conducted survey operations for the SED, prepared the data for the report and data tables, wrote some of the report text, and reviewed early drafts of the report. NORC staff who played a valuable role in the 2013 SED are Ipek Bilgen, Marietta Bowman, Matthew Deihl, Mireya Dominguez, Zachary Gebhardt, Brianna Groenhout, Isabel Buzman-Barron, Sarah Hernandez, Tom Hoffer, Mary Ann Latter, Stephen Schacht, Scott Sederstrom, Ed Sipulski, and Kristy Webber.

Production of the printed volume was guided by Cheryl Roesel and produced by Tanya Gore and Christine Hamel (NCSES). Eileen Kessler and staff at OmniStudio, Inc., designed the layout. Development of the Web version was guided by Robin Pentola and Rajinder Raut (NCSES), with technical assistance from staff of Penobscot Bay Media.

Suggested Citation

National Science Foundation, National Center for Science and Engineering Statistics. 2015. *Doctorate Recipients from U.S. Universities: 2013.* Special Report NSF 15-304. Arlington, VA. Available at http://www.nsf.gov/statistics/sed/2013/.

NSF 15-304